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FINAL SUMMARY REPORT FOR SOUTHERN LOBE TRICHLOROETHENE GROUNDWATER PLUME DELINEATION NAS FORT WORTH TX

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HYDRO GeoLogic INC.

FINAL
SUMMARY REPORT
SOUTHERN LOBE TRICHLOROETHENE GROUNDWATER PLUME DELINEATION
NAS FORT WORTH JRB, TEXAS

Prepared for

Air Systems Command, Air Force Plant 4
Brooks AFB, Texas

Contract Number F41624-95-D-8005

July 2000

HydroGeoLogic, Inc.
1155 Herndon Parkway
Suite 900
Herndon, Virginia 20170
(703) 478-5186

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1155 Herndon Parkway, Suite 900
Herndon, VA 20170

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REPORT DOCUMENTATION PAGE

Form Approved

QMB No. 0704-0188

Public reporting for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1024, Arlington, VA 22202-1302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	July 2000	Final

4. TITLE AND SUBTITLE	4. FUNDING NUMBERS
Final Summary Report Southern Lobe Trichloroethene Groundwater Plume Delineation NAS Fort Worth JRB, Texas	F41624-95-D-8005 Delivery Order 019
6. AUTHOR(S) HydroGeoLogic, Inc	
7. PERFORMANCE ORGANIZATION NAMES(S) AND ADDRESS(S) HydroGeoLogic, Inc. 1155 Herndon Parkway, Suite 900 Herndon, VA 20170	8. PERFORMANCE ORGANIZATION REPORT NUMBER AFC001
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(S) AFCEE/ERD Brooks AFB Texas 78235-5328	10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT	12b. DISTRIBUTION CODE
Unlimited	

3. ABSTRACT (Maximum 200 words)

This document presents the Final Summary Report Southern Lobe Trichloroethene (TCE) Groundwater Plume Delineation at NAS Fort Worth JRB, Texas.

This report presents detailed results of findings compiled from data collected during the site investigation of the southern lobe of the basewide TCE plume.

The purpose of this effort was to delineate the south and southeastern extent of the TCE groundwater plume, along the Department of Defense (DOD) boundary and to determine the need for a possible expansion of the groundwater treatment system to prevent migration of TCE off DOD property.

14. SUBJECT TERMS	15. NUMBER OF PAGES
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE.	19. SECURITY CLASSIFICATION OF ABSTRACT.	20. LIMITATION OF ABSTRACT

PREFACE

This Final Summary Report was prepared for the Air Systems Command (ASC), Air Force Plant 4 (AFP 4) Fort Worth, Texas to present the findings of recent soil and groundwater investigations in the vicinity of the southern lobe of the basewide trichloroethene (TCE) groundwater plume at Naval Air Station Fort Worth Joint Reserve Base (NAS Fort Worth JRB), Texas. The work was conducted under Contract Number F41624-95-D-8005, Delivery Order 19, issued to HydroGeoLogic, Inc. (HydroGeoLogic). The Air Force Center for Environmental Excellence (AFCEE) Contracting Officer's Representative (COR) is Mr. Don Ficklen. The ASC Customer Representative is Mr. George Walters. HydroGeoLogic's Project Manager is Ms. Lynn Morgan.

Activities described by this report were performed in accordance with HydroGeoLogic's Draft Work Plans Focused Feasibility Study and Interim Remedial Action (HydroGeoLogic, 1999a), the Final Basewide Quality Assurance Project Plan (HydroGeoLogic, 1998), and AFCEE-approved modifications.

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LIST OF ACRONYMS AND ABBREVIATIONS

AFCEE	Air Force Center for Environmental Excellence
AFP 4	Air Force Plant 4
AOC	Area of Concern
ARAR	applicable or relevant and appropriate requirement
ASTM	American Society for Testing and Materials
BTEX	benzene, toluene, ethylbenzene, and xylenes
CAFB	Carswell Air Force Base
cm/s	centimeters per second
COR	Contracting Officer's Representative
DCE	dichloroethene
DOD	Department of Defense
DPT	direct push technology
DQE	data quality evaluation
EDD	electronic data deliverables
EPA	U.S. Environmental Protection Agency
ERPIMS	Environmental Resources Program Information Management System
ESE	Environmental Science and Engineering, Inc.
F	data qualifier indicating analyte was detected at concentration less than PQL but greater than MDL
°F	degrees Fahrenheit
ft/d	feet per day
FSP	Field Sampling Plan
gpd/ft	gallons per day per foot
gpd/ft^2	gallons per day per square foot
GSAP	Groundwater Sampling and Analysis Program
HSA	hollow stem auger
HydroGeoLogic	HydroGeoLogic, Inc.
IRA	interim remedial action
J	data qualifier indicating the analyte was positively identified, the quantitation is an estimation

LIST OF ACRONYMS AND ABBREVIATIONS (continued)

LCS	laboratory control sample
μg/L	micrograms per liter
MCL	maximum contaminant level
MDL	method detection limit
MQL	method quantitation limit
MS/MSD	matrix spike/matrix spike duplicate
MSC	medium specific concentrations
MTBE	methyl *tert*-butyl ether
NAS Fort Worth JRB	Naval Air Station Fort Worth Joint Reserve Base
NGVD	National Geodetic Vertical Datum
%R	percent recovery
PE	performance evaluation
PID	photoionization detector
PQL	practical quantitation limit
PVC	polyvinyl chloride
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
Radian	Radian Corporation
ROD	Record of Decision
RPD	relative percent difference
RRS	Risk Reduction Standard
SQL	sample quantitation limit
STL	Severn Trent Laboratories
SWMU	solid waste management unit
TAC	Texas Administrative Code
TCE	trichloroethene
TDOT	Texas Department of Transportation
TNRCC	Texas Natural Resource Conservation Commission
U	data qualifier indicating analyte was not detected at the specified detection limit

LIST OF ACRONYMS AND ABBREVIATIONS (continued)

UJ	data qualifier indicating analyte was not detected; the numerical value is above the PQL but is estimated due to deficiencies in the QC criteria
USGS	U.S. Geological Survey
VOC	volatile organic compound

TAB

Section 1.0

FINAL
SUMMARY REPORT
SOUTHERN LOBE TRICHLOROETHENE GROUNDWATER PLUME DELINEATION
NAS FORT WORTH JRB, TEXAS

1.0 INTRODUCTION

This Final Summary Report provides all existing sampling and analytical data that delineates the nature and extent of the southern lobe of the basewide trichloroethene (TCE) groundwater plume at Naval Air Station Fort Worth Joint Reserve Base (NAS Fort Worth JRB), Texas (Figure 1.1). The field investigation was initiated to further delineate the TCE plume along the boundary of Department of Defense (DOD) property to support the possible expansion of the existing groundwater treatment system in order to prevent TCE contamination from migrating off site as stipulated in the Air Force Plant 4 (AFP 4) Record of Decision (ROD) (Rust Geotech, 1996).

As part of the groundwater investigation at NAS Fort Worth JRB, HydroGeoLogic, Inc. (HydroGeoLogic) conducted a screening groundwater investigation at the southern lobe of the basewide TCE plume in July 1998 (Figure 1.2). This investigation provided additional information on the hydrogeologic nature of the area necessary to determine locations for several new monitoring wells and potential recovery wells. Based on screening results, nine wells were installed in June and August of 1999 around the Wherry Housing and Carswell Golf Course area (Figure 1.2). Three rounds of groundwater samples were collected from these wells to delineate the southeastern extent of the TCE plume and to determine if the recovery wells installed should be connected to the extraction system. The data collected from previous investigations are presented in this report. In addition, analytical results from groundwater sampling in the area of the southern lobe of the TCE plume, performed as part of the 1999 basewide quarterly groundwater sampling, are presented to provide current information for TCE and its daughter products in the southern lobe of the basewide TCE plume.

1.1 INVESTIGATION OBJECTIVES

The purpose of the field work was to collect groundwater data needed to delineate the nature and extent of VOC contamination in the southern lobe portion of the basewide TCE plume and, as a possible interim remedial action (IRA), to provide an existing groundwater treatment system with expansion capacity to treat TCE contaminated groundwater to prevent the plume from migrating beyond the former Carswell Air Force Base (CAFB) boundary at concentrations greater than applicable or relevant and appropriate requirements (ARARs), in this case the maximum contaminant level (MCL) of 5 micrograms per liter (μg/L). The field activities included:

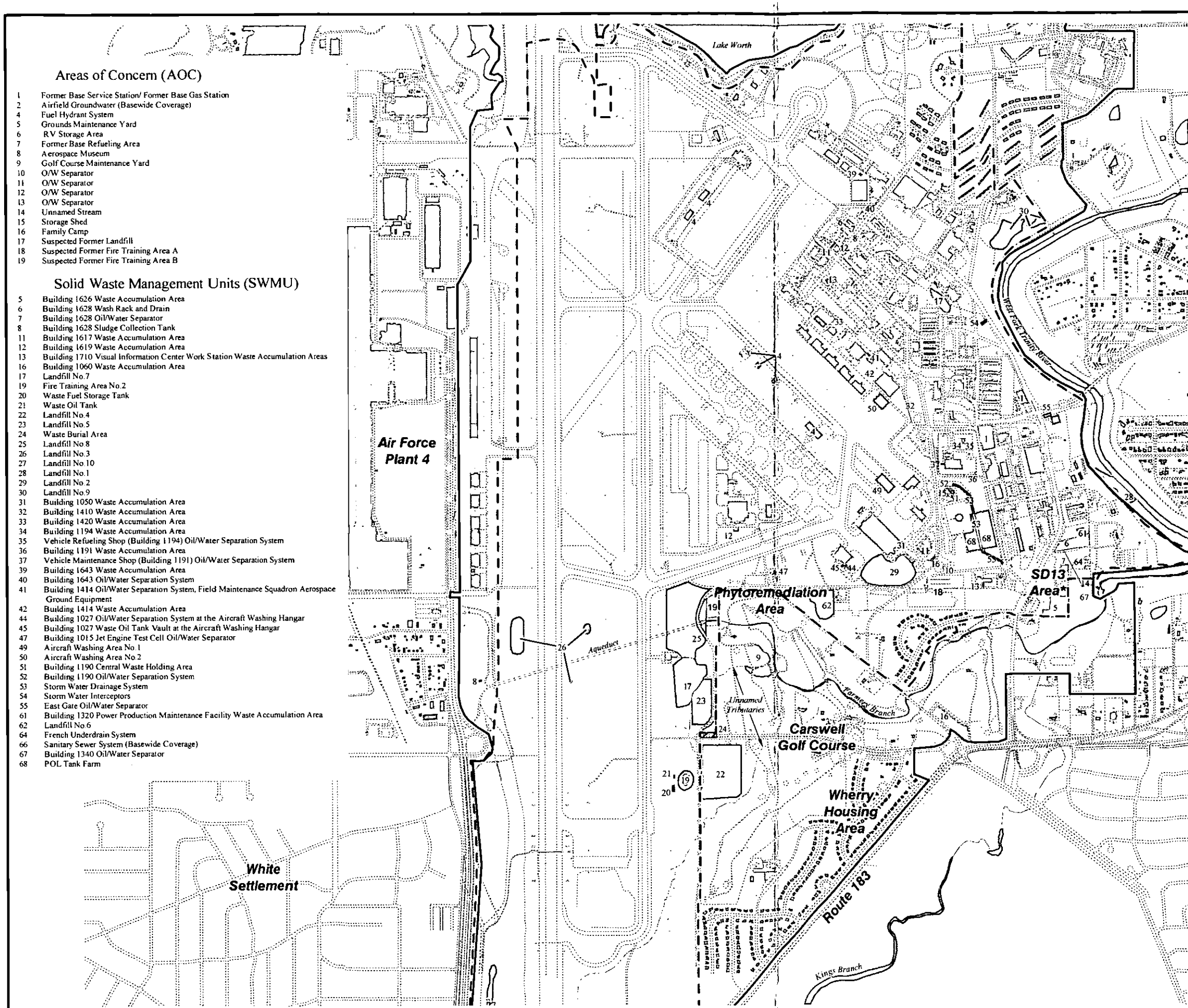
The installation of four 2-inch monitoring wells and five 4-inch monitoring wells (that can be converted to extraction wells) in the locations shown in Figure 1.2;

- Three rounds of bi-monthly groundwater sampling at the nine new monitoring/extraction wells, existing monitoring well ITMW-01T, and two rounds of sampling at the 11 existing recovery wells.

The primary data needs to be satisfied from the field work were: (1) to fill data gaps with respect to the hydrogeological regime in the southern lobe TCE plume region. This was accomplished by installing monitoring/extraction wells in the southern groundwater plume to determine the depth to bedrock, the lithologic unit which represents bedrock, the depth to groundwater, and the direction of groundwater flow; and (2) to determine the nature and extent of the groundwater contamination along the south and southeastern boundary of the southern lobe TCE plume. Groundwater sampling was performed on the southern lobe of the TCE plume to delineate groundwater contamination.

1.2 REPORT ORGANIZATION

Section 2.0 of this report provides a description of the environmental setting. Section 3.0 includes a description of the previous screening investigations performed in July 1998; the field investigations performed in the three bi-monthly rounds of groundwater sampling occurring from June to November 1999; and the 1999 quarterly groundwater sampling activities performed in the area of the southern lobe of the basewide TCE plume. Section 4.0 of this report presents the quality assurance/quality control (QA/QC) program implemented for this project. Section 5.0 presents the analytical results and results of the activities described in Section 3.0. A summary of the work performed to date is presented in Section 6.0 and the references are listed in Section 7.0. Appendices contain boring logs, well construction forms, well development forms, groundwater field sampling data sheets, field notes, field sampling reports, chain of custody forms, and laboratory analytical results for the presented investigations.



Areas of Concern (AOC)

1 Former Base Service Station/ Former Base Gas Station
2 Airfield Groundwater (Basewide Coverage)
4 Fuel Hydrant System
5 Grounds Maintenance Yard
6 RV Storage Area
7 Former Base Refueling Area
8 Aerospace Museum
9 Golf Course Maintenance Yard
10 O/W Separator
11 O/W Separator
12 O/W Separator
13 O/W Separator
14 Unnamed Stream
15 Storage Shed
16 Family Camp
17 Suspected Former Landfill
18 Suspected Former Fire Training Area A
19 Suspected Former Fire Training Area B

Solid Waste Management Units (SWMU)

5 Building 1626 Waste Accumulation Area
6 Building 1628 Wash Rack and Drain
7 Building 1628 Oil/Water Separator
8 Building 1628 Sludge Collection Tank
11 Building 1617 Waste Accumulation Area
12 Building 1619 Waste Accumulation Area
13 Building 1710 Visual Information Center Work Station Waste Accumulation Areas
16 Building 1060 Waste Accumulation Area
17 Landfill No.7
19 Fire Training Area No.2
20 Waste Fuel Storage Tank
21 Waste Oil Tank
22 Landfill No.4
23 Landfill No.5
24 Waste Burial Area
25 Landfill No.8
26 Landfill No.3
27 Landfill No.10
28 Landfill No.1
29 Landfill No.2
30 Landfill No.9
31 Building 1050 Waste Accumulation Area
32 Building 1410 Waste Accumulation Area
33 Building 1420 Waste Accumulation Area
34 Building 1194 Waste Accumulation Area
35 Vehicle Refueling Shop (Building 1194) Oil/Water Separation System
36 Building 1191 Waste Accumulation Area
37 Vehicle Maintenance Shop (Building 1191) Oil/Water Separation System
39 Building 1643 Waste Accumulation Area
40 Building 1643 Oil/Water Separation System
41 Building 1414 Oil/Water Separation System, Field Maintenance Squadron Aerospace Ground Equipment
42 Building 1414 Waste Accumulation Area
44 Building 1027 Oil/Water Separation System at the Aircraft Washing Hangar
45 Building 1027 Waste Oil Tank Vault at the Aircraft Washing Hangar
47 Building 1015 Jet Engine Test Cell Oil/Water Separator
49 Aircraft Washing Area No.1
50 Aircraft Washing Area No.2
51 Building 1190 Central Waste Holding Area
52 Building 1190 Oil/Water Separation System
53 Storm Water Drainage System
54 Storm Water Interceptors
55 East Gate Oil/Water Separator
61 Building 1320 Power Production Maintenance Facility Waste Accumulation Area
62 Landfill No.6
64 French Underdrain System
66 Sanitary Sewer System (Basewide Coverage)
67 Building 1340 Oil/Water Separator
68 POL Tank Farm

HydroGeoLogic, Inc.
Southern Lobe TCE Groundwater Plume Delineation
NAS Fort Worth JRB, Texas

Figure 1.1

Base Map
NAS Fort Worth JRB

U.S. Air Force Center for Environmental Excellence

Legend

- - - - NAS Fort Worth JRB (Carswell Field)

——— Former Carswell Air Force Base

1 Area of Concern (AOC)

68 Solid Waste Management Unit (SWMU)

Groundwater Treatment Plant

* SD13 Area is comprised of AOC 7, SWMU 64 and SWMU 67.

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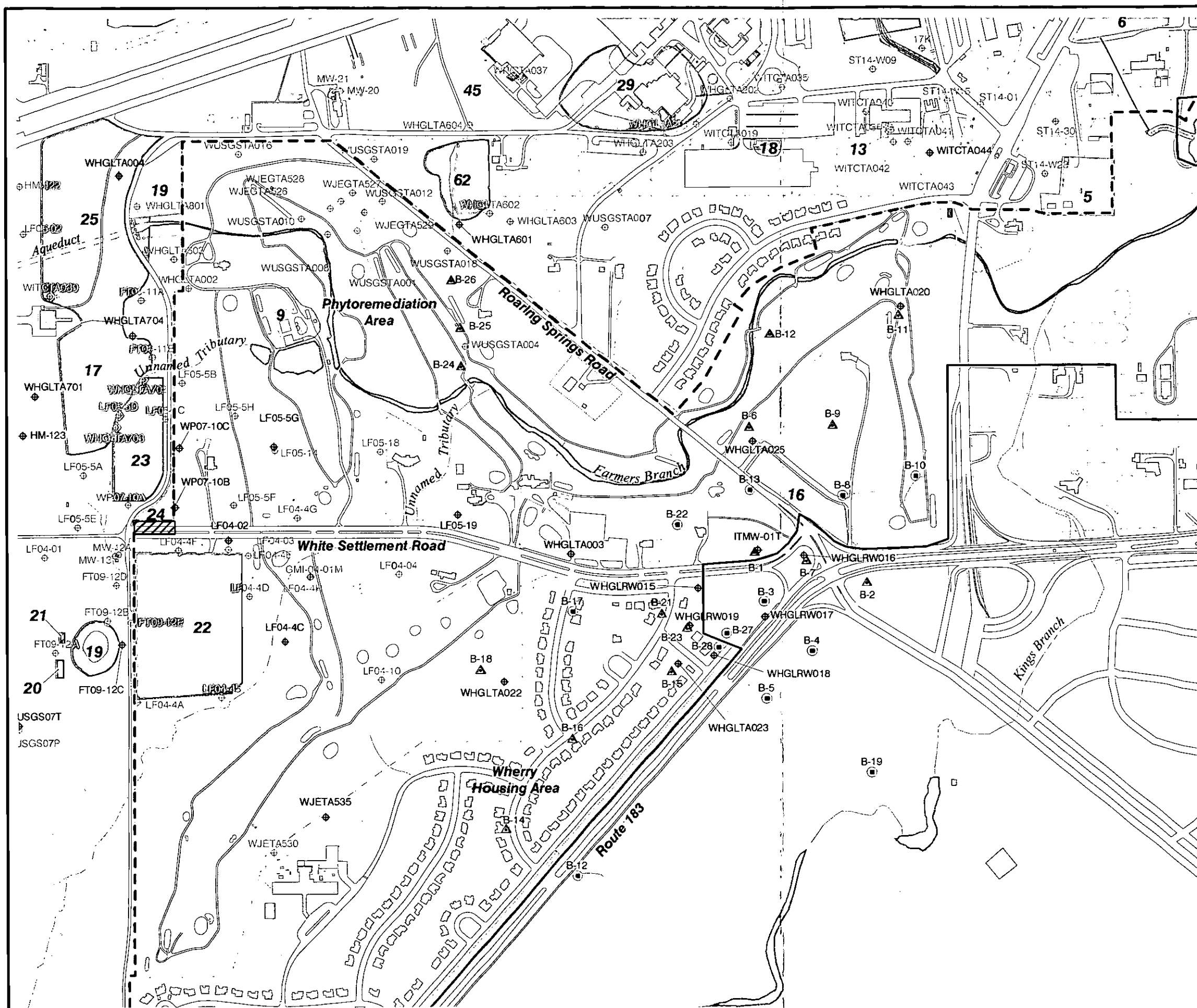

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Southern Lobe TCE Groundwater Plume Delineation
NAS Fort Worth JRB, Texas

Figure 1.2
Site Map
NAS Fort Worth JRB

U.S. Air Force Center for Environmental Excellence

Legend

- NAS Fort Worth JRB Boundary (Carswell Field)
- Former Carswell Air Force Base Boundary
- Plume Monitoring Wells
- Other Monitoring Wells
- Monitoring Wells Installed in 1999 for the Southern Lobe TCE Plume Delineation
- 1998 Boring Locations
- 1998 Boring/Temporary Piezometer Locations
- Groundwater Treatment System

Area of Concern

5 Grounds Maintenance Yard
9 Golf Course Maintainence Yard
13 O/W Separator
16 Family Camp
18 Suspected Former Fire Training Area
19 Suspected Former Fire Training Area

Solid Waste Management Unit

17 Landfill No. 7
19 Fire Training Area No. 2
20 Waste Fuel Storage Area
21 Waste Oil Tank
22 Landfill No. 4
23 Landfill No. 5
24 Waste Burial Area
25 Landfill No. 8
62 Landfill No. 6

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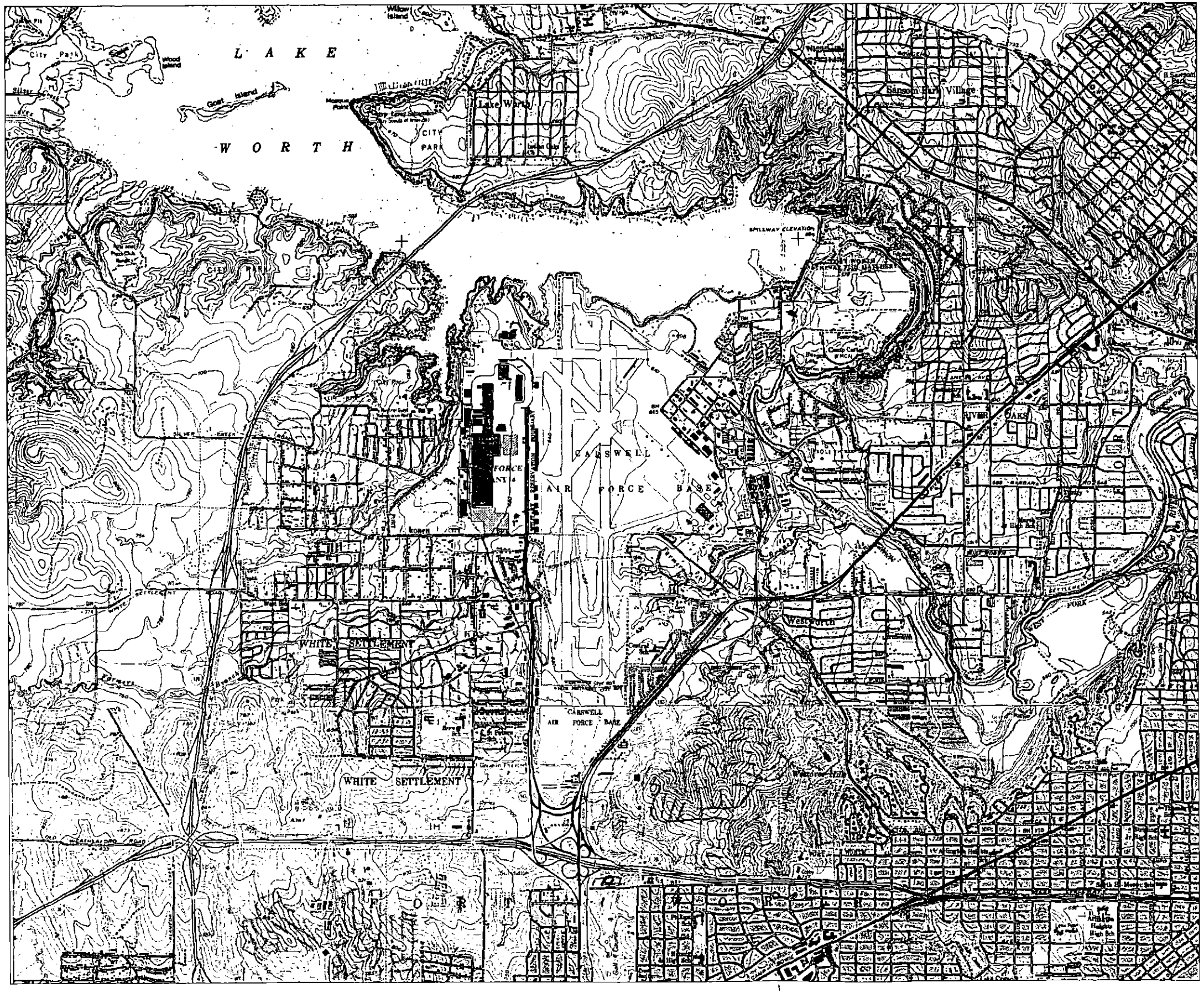

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Southern Lobe TCE Groundwater Plume Delineation
NAS Fort Worth JRB, Texas

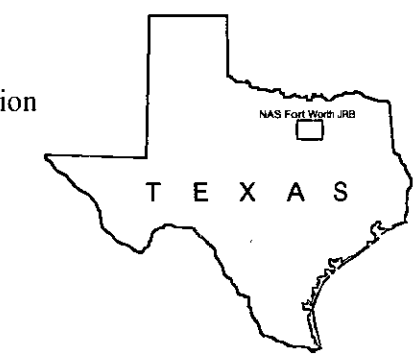
Figure 2.1

NAS Fort Worth JRB Regional Topographic Map

Air Force Center for Environmental Excellence

Legend

Site Location



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Section 2.0

2.0 SITE IDENTIFICATION AND DESCRIPTION

Descriptions of the operational history and previous environmental investigations at NAS Fort Worth JRB can be found in Section 1.0 of the Draft Work Plan Focused Feasibility Study and Interim Remedial Action (HydroGeoLogic, 1999a). This section provides a description of the environmental setting of the base and surrounding area.

On October 1, 1994, the Air Force transferred the majority of the property that constituted CAFB to the U.S. Navy to become NAS Fort Worth JRB, Carswell Field. NAS Fort Worth JRB is located on 2,264 acres of land in Tarrant County, Texas, 8 miles west of downtown Fort Worth. The base is bordered by Lake Worth to the north; the West Fork of the Trinity River, River Oaks, and Westworth Village to the east; other urban areas of Fort Worth to the northeast and southeast; White Settlement to the west and southwest; and AFP 4 to the west. The area surrounding NAS Fort Worth JRB is mostly suburban. Land use in the immediate vicinity of the base is industrial, commercial, residential, and recreational (A.T. Kearney, 1989).

2.1 PHYSIOGRAPHY

The NAS Fort Worth JRB area is located along the border zone between two physiographic provinces. The southeastern part of the base is situated within the Grand Prairie section of the Central Lowlands Physiographic Province. The Central Lowlands Physiographic Province is characterized by broad, eastward-sloping terrace surfaces that are interrupted by westward-facing escarpments. The land surface is typically grass covered and treeless except for isolated strands of upland timber. The northwestern part of the NAS Fort Worth JRB area is situated within the Western Cross Timbers Physiographic Province, which is characterized by rolling topography and a heavy growth of post and blackjack oaks (Radian Corporation [Radian], 1989). Surface elevations for this region range from about 850 feet above national geodetic vertical datum (NGVD) west of the base, to approximately 550 feet above NGVD, along the eastern side of the base. Figure 2.1 is a portion of the Lake Worth and Benbrook Texas, U.S. Geological Survey topographic maps showing the relief of the NAS Fort Worth JRB Area.

2.2 REGIONAL GEOGRAPHY

The major geologic units of interest for the region, from youngest to oldest, are as follows: (1) the Quanternary Alluvium (including fill material and terrace deposits), (2) the Cretaceous Goodland Limestone, (3) the Cretaceous Walnut Formation, (4) the Cretaceous Paluxy Formation, (5) the Cretaceous Glen Rose Formation, and (6) the Cretaceous Twin Mountains Formation. A generalized cross section of the geology beneath NAS Fort Worth JRB is presented in Figures 2.2 and 2.3 (Radian, 1989). The areal limits of surface exposure of these geologic units at NAS Fort Worth JRB are shown in Figure 2.4. The regional dip of these stratigraphic units beneath NAS Fort Worth JRB is between 35 to 40 feet per mile in an easterly to southeasterly direction. NAS Fort Worth JRB is located on the relatively stable Texas Craton, west of the faults that lie along the Ouachita Structural Belt. No major faults or fracture zones have been mapped near the base.

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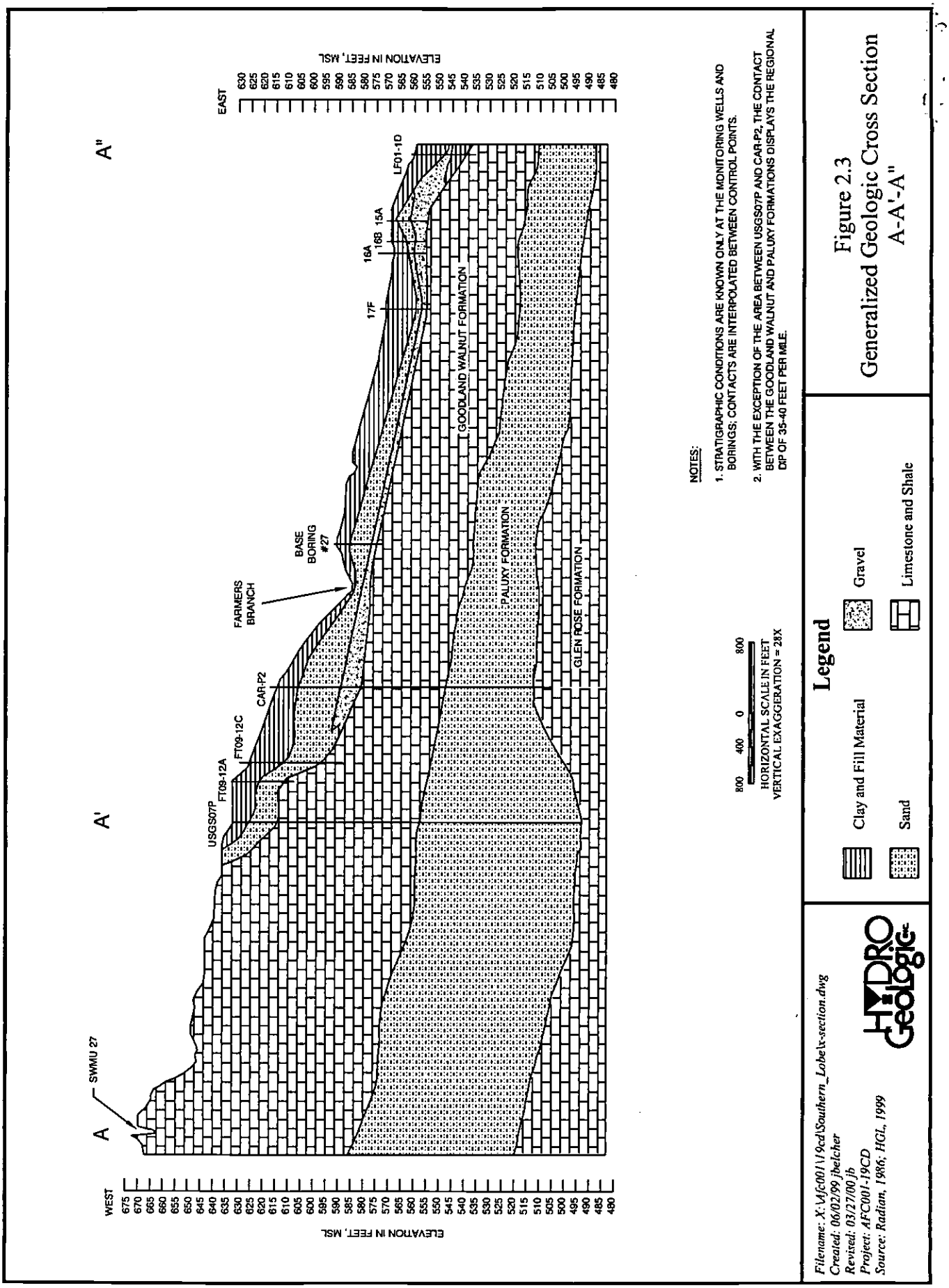
Created: 03/11/99 jbelcher
Revised: 07/26/00 jb
Source: HydroGeoLogic, Inc—GIS Database

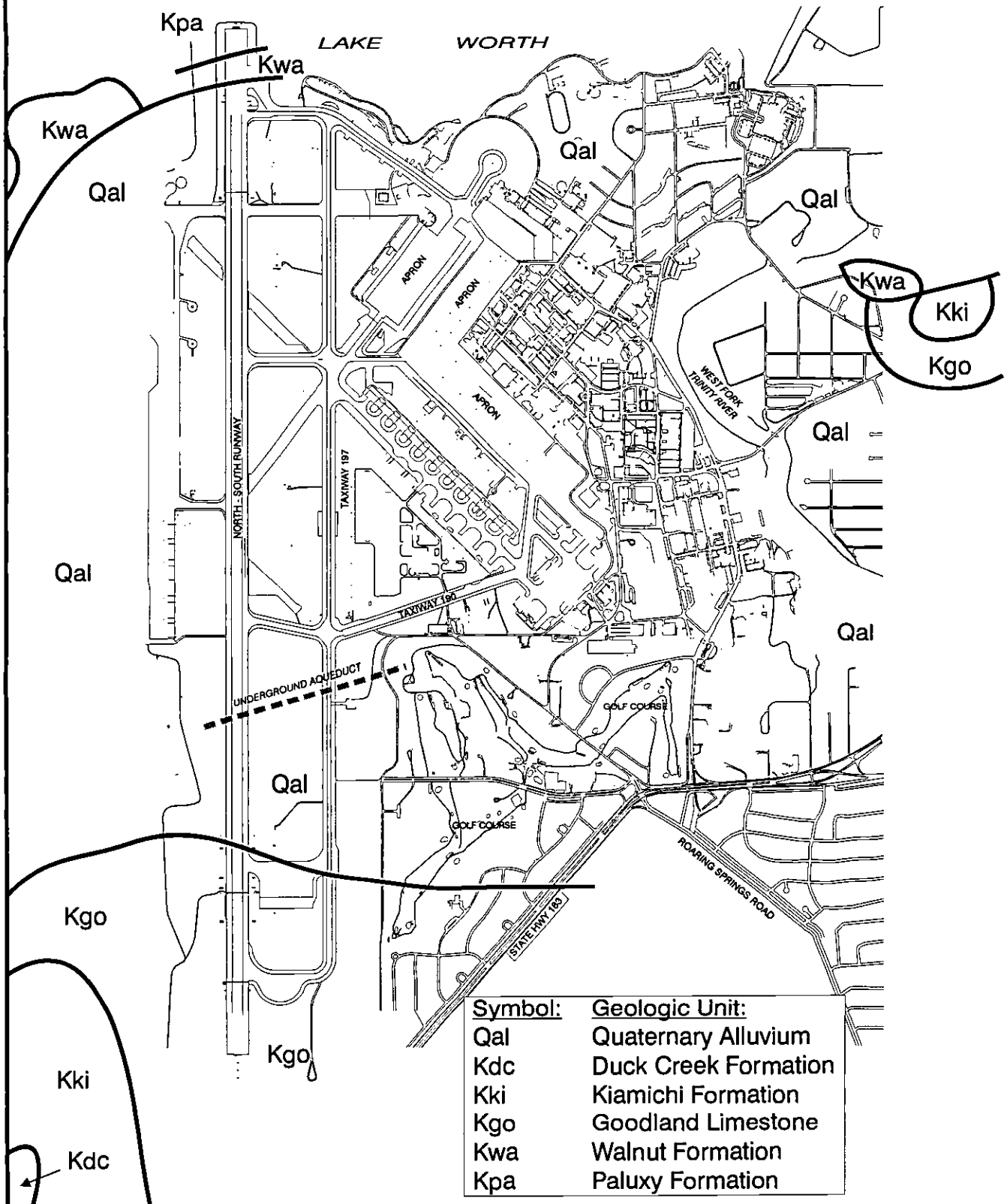
Legend

- NAS Fort Worth JRB Boundary
- Former Carswell AFB Boundary
- SWMU 27 Location
- 660 Topographic Contour

Figure 2.2
Generalized Cross Section Location A-A'-A"


A
A'
A"
SWMU 27
WEST
EAST
ELEVATION IN FEET, MSL
USGS07P
FT09-12A
FT09-12C
CAR-P2
FARMERS BRANCH
BASE BORING #27
17F
16A
16B
15A
LF01-1D
GOODLAND WALNUT FORMATION
PALUXY FORMATION
GLEN ROSE FORMATION
NOTES:
1. STRATIGRAPHIC CONDITIONS ARE KNOWN ONLY AT THE MONITORING WELLS AND BORINGS; CONTACTS ARE INTERPOLATED BETWEEN CONTROL POINTS.
2. WITH THE EXCEPTION OF THE AREA BETWEEN USGS07P AND CAR-P2, THE CONTACT BETWEEN THE GOODLAND WALNUT AND PALUXY FORMATIONS DISPLAYS THE REGIONAL DIP OF 35-40 FEET PER MILE.
800 400 0 800
HORIZONTAL SCALE IN FEET
VERTICAL EXAGGERATION = 28X
Legend
Clay and Fill Material
Gravel
Sand
Limestone and Shale
Figure 2.3
Generalized Geologic Cross Section
A-A'-A"
Filename: X:\Afc001\19cd\Southern_Lobe\x-section.dwg
Created: 06/02/99 jbeicher
Revised: 03/27/00 jb
Project: AFC001-19CD
Source: Radian, 1986; HGL, 1999
HYDRO GeoLogic

524 26



Filename: X:\AFC001\19CD\Report \Areal_Distr.cdr
Revised: 10/28/99 ap
Project: AFC001-26HABB
Map Source: Radian, 1989

HYDRO GeoLogic INC.

Legend

0 1000 2000
SCALE IN FEET

N

Figure 2.4
Areal Distribution of Geologic Units

2.3 GROUNDWATER

The following five hydrogeologic units, listed from the shallowest to the deepest, located in the NAS Fort Worth JRB area are shown in Figure 2.5 and include: (1) an upper perched-water zone occurring in the alluvial terrace deposits associated with the Trinity River (Terrace Alluvium), (2) an aquitard of predominantly dry limestone with interbedded fine-grained clay and shale layers of the Goodland and Walnut Formations, (3) an aquifer in the sandstone of the Paluxy Formation, (4) an aquitard of relatively impermeable limestone in the Glen Rose Formation, and (5) a major aquifer in the sandstone of the Twin Mountains Formation. Table 2.1 presents additional information on the stratigraphic units found beneath NAS Fort Worth JRB. Each of the major lithologic units beneath NAS Fort Worth JRB is examined in more detail in the following paragraphs. Descriptions of the uppermost water bearing units present beneath NAS Fort Worth JRB are presented below. Investigation results, including potentiometric surface contour maps, are provided in Section 5.0.

2.3.1 Terrace Alluvium Deposits

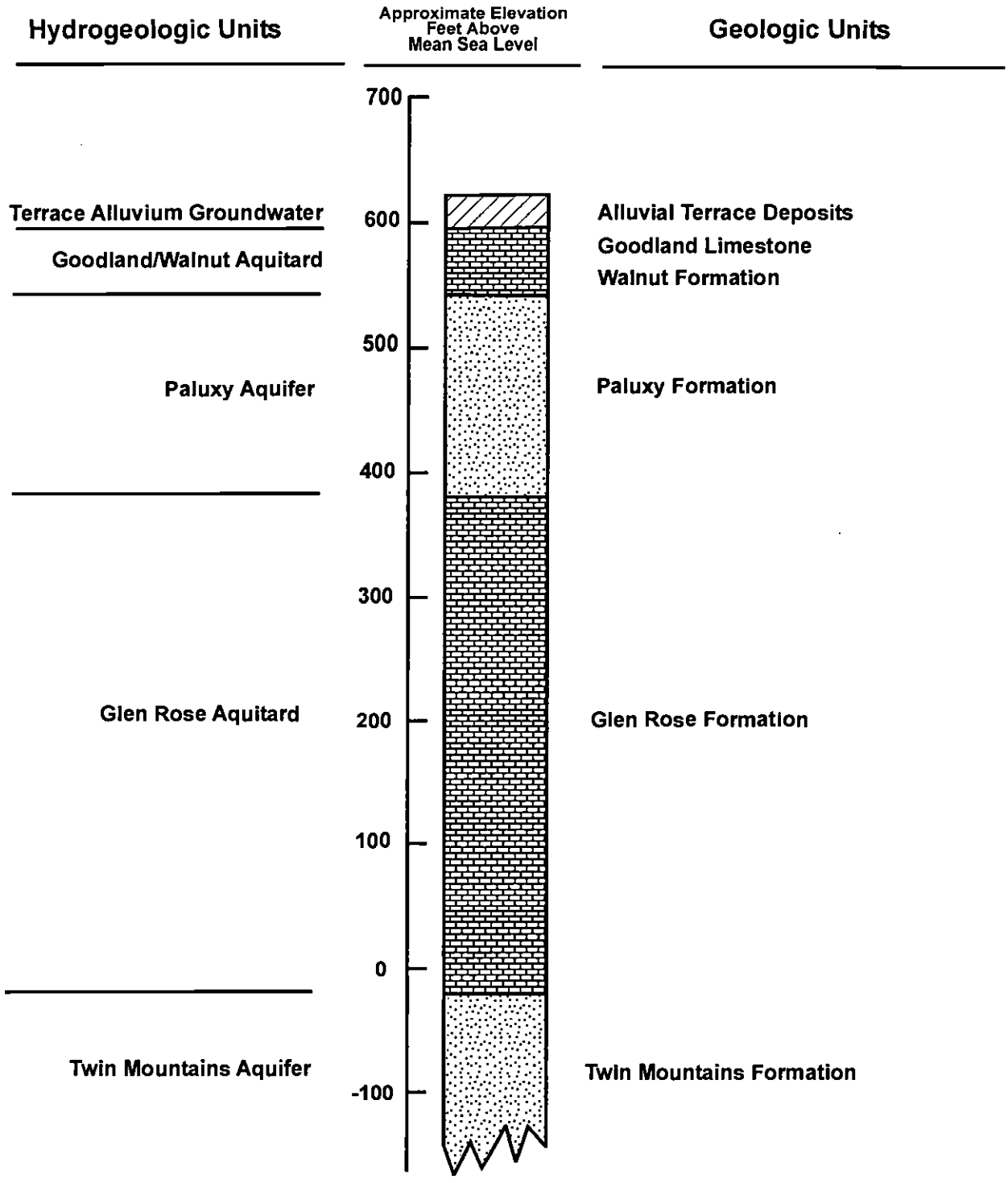
The uppermost groundwater in the area occurs within the pore space of the grains of silt, clay, sand, and gravel deposited by the Trinity River. In some parts of Tarrant County, primarily in those areas adjacent to the Trinity River, groundwater from the terrace deposits is used for irrigation and residential use. However, groundwater from the terrace deposits is not often used as a source of potable water due to its limited distribution, poor yield, and susceptibility to surface/storm-water pollution (U.S. Geological Survey [USGS], 1996). No potable water supply monitoring wells are completed in the Terrace Alluvium within 0.5 miles of NAS Fort Worth JRB.

Recharge to the water-bearing deposits occurs through infiltration from precipitation and from surface water bodies. Extensive on-site pavement and construction restricts this recharge. Additional recharge, however, comes from leakage in water lines, sewer systems, storm drains, and cooling water systems. This inflow of water to the shallow aquifer locally affects groundwater flow patterns and contamination transport. The estimated hydraulic conductivity of the Terrace Alluvium groundwater is 4.57 gallons per day per square foot (gpd/ft^2) (Radian, 1989).

Flow between aquifers is restricted by the Goodland/Walnut Formations; therefore, the Terrace Alluvium groundwater has no significant hydraulic connection to the underlying aquifers at NAS Fort Worth JRB. No evidence of contamination of the Paluxy aquifer has been found beneath NAS Fort Worth JRB.

The primary flow direction of water in the Terrace Alluvium is generally eastward toward the West Fork of the Trinity River, although localized variations exist across the base. The hydraulic gradient across the base is variable, reflecting variations in the flow direction and localized recharge. Groundwater discharge occurs into surface water on-site, specifically Farmers Branch Creek. Potentiometric maps of NAS Fort Worth JRB Terrace Alluvium

524 23



Filename: X:\AFC001\19CD\Report \Strat_column.cdr
Revised: 10/28/99 ap
Project: AFC001-19CD
Map Source: Radian, 1989

HYDRO GeoLogic Inc.

Legend

- Alluvium
- Limestone
- Sandstone

Figure 2.5
Stratigraphic Column Correlating Hydrogeologic Units and Geologic Units

Table 2.1
Stratigraphic Units at NAS Fort Worth JRB, Texas[1]

Era	System	Series/Group	Strati-Graphic Unit	Thick-Ness (Feet)[2]	Lithologic Characteristics[3]	Water-Yielding Characteristics
Cenozoic	Quaternary (1.8 mya to present)	Holocene	Fill material	0	Construction debris	Permeability varies; gravels and sands permeable
			Recent alluvial deposits	0-50	Gravel, sand, silt, clay	Permeability varies; gravels and sands permeable
		Pleistocene	Terrace alluvial deposits	0-60	Gravel, sand, silt, clay	Permeability varies; gravels and sands permeable
Mesozoic	Cretaceous (65 to 140 mya)	Comanchean/ Fredericksburg	Goodland limestone	0-40	White fossiliferous limestone, coarsely nodular, resistant, and dense; contains some marl	Impermeable where not weathered; considered confining unit
			Walnut Formation	0.5-30	Medium to dark grey clay and limestone with shell conglomerates, fossiliferous, Gryphaea beds	Very low permeability; considered confining unit
		Comanchean/ Trinity	Paluxy Formation	130-175	Light grey to greenish-grey sandstone and mudstone; fine-grained to coarse-grained sandstone	Considered an aquifer; yields small to moderate quantities of water
			Glen Rose Formation	150, range unknown at AFP 4	Brownish-yellow and gray alternating limestone, marl, shale, and sand	Low permeability; considered confining unit in area of AFP 4
			Twin Mountains Formation[4]	200, range unknown at AFP 4	Fine- to coarse-grained sandstone shale and claystone, basal gravel conglomerate	Coarse sandstones and parts of formation considered aquifer; yields moderate to large quantities of water

Notes:
[1] Table adapted from USGS, 1996.
[2] Thickness determined from site logs, except for Glen Rose Limestone and Twin Mountains Formation (Baker et al., 1990, Figure 4, as cited in USGS 1996).
[3] Lithologic characteristics determined from field observations and from Winton and Adkins, 1919; University of Texas, Bureau of Economic Geology, 1972; U.S. Army Corps of Engineers, 1986; Baker et al., 1990; Environmental Science and Engineering, Inc., 1994, all as cited in USGS 1996.
[4] This stratigraphic name does not conform to the usage of the USGS.
mya - million years ago

groundwater developed from data obtained in previous gauging events show an easterly trend in groundwater flow across the base toward the West Fork of the Trinity River.

As will be described later in the report, a paleochannel and basal gravel combined with bedrock lows appear to be a preferential pathway for groundwater and contaminants in the groundwater. This preferred pathway is depicted on Figure 2.6.

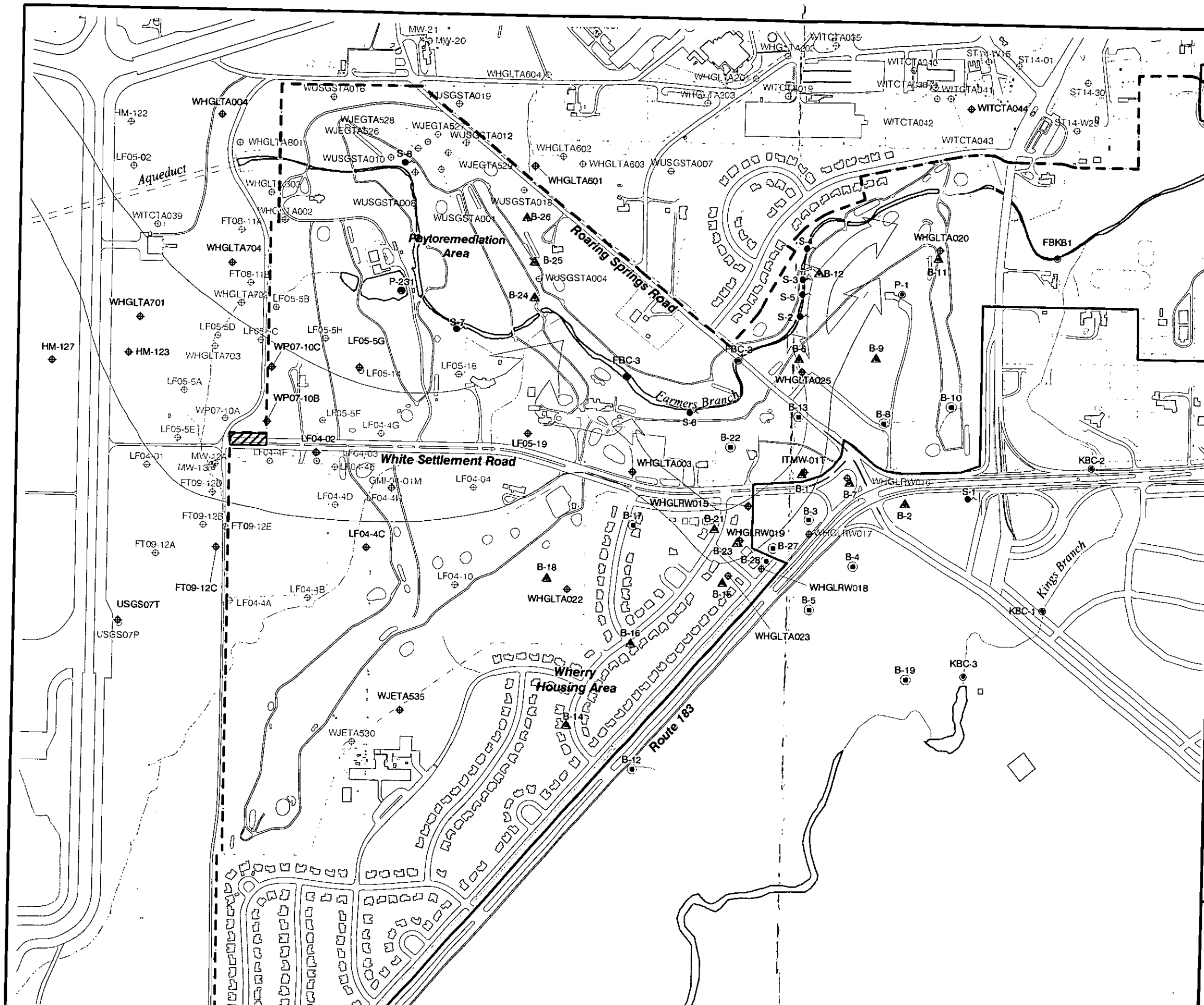
Water elevations were measured quarterly between April 1995 and January 1996, and semi-annually (i.e January and July) in 1997 and 1999. A review of these water level elevations shows little seasonal or annual fluctuation indicating a steady trend in groundwater flow direction from west to east across the site.

2.3.2 Goodland/Walnut Aquitard

The groundwater within the terrace deposits is isolated from groundwater within the lower aquifers by the low permeability rocks of the Goodland Limestone and Walnut Formations. The primary inhibitors to vertical groundwater movement within these units are the fine-grained clay and shale layers that are interbedded with layers of limestone. Some groundwater movement does occur between the individual bedding planes of both of these units, but the vertical hydraulic conductivity has been calculated to range between 1.2×10^{-9} centimeters per second (cm/s) to 7.3×10^{-11} cm/s for the NAS Fort Worth JRB and AFP 4 area. This corresponds to a vertical advective velocity rate that ranges between 1.16×10^{-3} feet per day (ft/d) to 5.22×10^{-3} ft/d (Environmental Science and Engineering, Inc. [ESE], 1994). At the AFP 4 "window area," the Goodland/Walnut Aquitard is breached, and the Alluvial Terrace groundwater is in direct communication with the groundwater in the Paluxy aquifer. A significant number of monitoring wells and borings have been advanced on NAS Fort Worth JRB, and no evidence has been found indicating that a similar window exists on the base.

2.3.3 Paluxy Aquifer

The Paluxy aquifer is an important source of potable groundwater for the Fort Worth area. Many of the surrounding communities, particularly White Settlement, obtain their municipal water supplies from the Paluxy aquifer. Groundwater from the Paluxy aquifer is also used in some of the surrounding farms and ranches for agricultural purposes. Due to the extensive use of the Paluxy aquifer, water levels have declined significantly over the years. Water levels in the NAS Fort Worth JRB vicinity have not decreased as much as in the Fort Worth area due to its proximity to the Lake Worth recharge area and the fact that the base does not use water from the Paluxy aquifer. Drinking water at the base is supplied by the city of Fort Worth, which uses Lake Worth as its water source. The groundwater of the Paluxy aquifer is contained within the openings created by gaps between bedding planes and cracks and fissures in the sandstones of the Paluxy Formation. Just as the Paluxy Formation is divided into upper and lower sand members, the aquifer is likewise divided into upper and lower aquifers. The upper sand is finer grained and contains a higher percentage of shale than the lower sand. Radian (1989) estimated the hydraulic conductivity and transmissivity to be 130 to 140 gpd/ft^2



HydroGeoLogic, Inc.
Southern Lobe TCE Groundwater Plume Delineation
NAS Fort Worth JRB, Texas

Figure 2.6
Site Geology
NAS Fort Worth JRB

U.S. Air Force Center for Environmental Excellence

Legend

- NAS Fort Worth JRB Boundary (Carswell Field)
- Former Carswell Air Force Base Boundary
- Plume Monitoring Wells
- Other Monitoring Wells
- Monitoring Wells Installed in 1999 For The Southern Lobe TCE Plume Delineation
- 1998 Boring Locations
- 1998 Boring/Temporary Piezometer Locations
- 1998 Spring Sample Locations
- 1998 Boring Locations
- Preferential Flow Pathway (Paleochannel and Bedrock Low)
- Groundwater Treatment System

N

400 0 400 800

SCALE IN FEET

Filename: X:\Afc001\19cd\Final_Summary_Southern_Lobe\site_geology.apr
Project: AFC001-19CD
Created: 07/27/00 jbelcher
Revised: 07/27/00 jb
Map Source: HGL ArcView GIS Database

HYDRO GeoLogic INC.

and 1,263 to 13,808 gallons per day per foot (gpd/ft), respectively. No evidence of contamination of the Paluxy aquifer has been identified beneath NAS Fort Worth JRB.

2.3.4 Glen Rose Aquitard

Below the Paluxy aquifer are the fine-grained limestone, shale, marl, and sandstone beds of the Glen Rose Formation. The thickness of the formation ranges from 250 to 450 feet. Although the sands in the Glen Rose Formation yield small quantities of groundwater in the area, the relatively impermeable limestone acts as an aquitard restricting water movement between the Paluxy aquifer above and the Twin Mountains aquifer below.

2.3.5 Twin Mountains Aquifer

The Twin Mountains Formation is the oldest and deepest water supply source used in the NAS Fort Worth JRB area. The Twin Mountains Formation occurs approximately 600 feet below NAS Fort Worth JRB with a thickness of between 250 to 430 feet. Recharge to the Twin Mountains aquifer occurs west of NAS Fort Worth JRB where the formation crops out. Groundwater movement follows the regional eastward slope of the bedrock. Like the groundwater in the Paluxy aquifer, the groundwater present in the Twin Mountains aquifer occurs under unconfined conditions in the recharge area and becomes confined as it moves down dip. Transmissivities in the Twin Mountain aquifer range from 1,950 to 29,700 gpd/ft and average 8,450 gpd/ft in Tarrant County. Permeabilities range from 8 to 165 gpd/ft^2 and average 68 gpd/ft^2 in Tarrant County (CH2M Hill, 1984).

2.4 SURFACE WATER

AS Fort Worth JRB is located within the Trinity River Basin adjacent to Lake Worth. The main surface water features of interest are Lake Worth, the West Fork of the Trinity River, and Farmers Branch Creek. Lake Worth, which was constructed in 1941 as a source of municipal water for the city of Fort Worth, borders the base to the north. The surface area of the lake is approximately 2,500 acres. The Paluxy aquifer discharges to Lake Worth near its western extent. However, in the portion of the lake near Bomber Road, the top of the Paluxy aquifer is recharged by Lake Worth. There does not appear to be a hydraulic connection between the Paluxy aquifer and the lake in the eastern portion where the Walnut Formation separates the Paluxy aquifer and Lake Worth. The elevation of the lake is fairly constant at approximately 594 feet above NGVD, the fixed elevation of the dam spillway (USGS, 1996).

The West Fork of the Trinity River, a major river in north central Texas, defines the eastern boundary of the base. The Trinity River flows southeast towards the Gulf of Mexico. Because the river has been dammed, the 100- and 500-year flood plains downstream of the dam do not extend more than 400 feet from the center of the river or any of its tributaries.

Storm water, which enters the NAS Fort Worth storm water drainage system, is discharged directly into Lake Worth. The outfall is permitted under the National Pollutant Discharge

Elimination System, and monitoring results document compliance with permit discharge limitations (IT Corporation, 1997).

Storm water which does not enter the drainage system, drains east towards the West Fork of the Trinity River. A portion of the base is drained by Farmers Branch Creek beginning within the community of White Settlement and flows eastward. Most of the flow in the creek is due to surface runoff, with some groundwater recharge from the Terrace Alluvium groundwater. Just south of AFP 4, Farmers Branch flows under the runway within two large culverts identified as an aqueduct. Two unnamed tributaries flow across the Flightline Area and discharge into Farmers Branch Creek. Another unnamed stream (approximately 200 feet long) is located in the SWMU units that comprise Site SD-13 and discharges to Farmers Branch Creek as well. A former oil/water separator (SWMU 67), located on the up gradient end of the stream near monitoring well SD13-06, emptied into the unnamed stream. The oil/water separator has been removed by the Air Force Base Conversion Agency. Most of the base drainage is intercepted by a series of storm drains and culverts, directed to oil/water separators, and discharged to the West Fork of the Trinity River downstream of Lake Worth. A small portion of the north end of the base drains directly into Lake Worth.

2.5 CLIMATE

The climate in the Fort Worth area is classified as sub-humid with long, hot summers and short, dry winters. Tropical maritime air masses control the weather during much of the year, but the passage of polar cold fronts and continental air masses can create large variations in winter temperatures. The average annual temperature in the area is 68.6 degrees Fahrenheit (BF), and monthly mean temperatures vary from 48.6BF in January to 86.1BF in July. The average daily minimum temperature in January is 37.7BF, and the lowest recorded temperature is 17BF. The average daily maximum temperature in July and August is 96.4BF, and the highest temperature ever recorded at the base was 106BF in the month of August. Freezing temperatures occur at NAS Fort Worth JRB an average of 33 days per year (National Weather Service, 2000).

Mean annual precipitation recorded at the base is approximately 32 inches. The wettest months are April and May, with a secondary maximum in September. The period from November to March is generally dry, with a secondary minimum in August. Snowfall accounts for a small percentage of the total precipitation between November and March. Thunderstorm activity occurs at the base an average of 45 days per year, with the majority of the activity between April and June. Hail may fall 2 to 3 days per year. The maximum precipitation recorded in a 24-hour period is 1.49 inches. On the average, measurable snowfall occurs 2 days per year.

TAB

Section 3.0

3.0 FIELD INVESTIGATIONS

3.1 TCE BACKGROUND

U.S. Air Force Plant No. 4 (AFP 4) was placed on the National Priority List (NPL) in August 1990 because of a large release of TCE arising from past disposal practices at AFP 4. While the source areas are currently being remediated, the dissolved TCE plume appears to have migrated toward the east of AFP 4 and extends under NAS Fort Worth JRB. The regional TCE plume can be subdivided into northern and southern lobes. The northern lobe is migrating primarily eastward from the AFP 4 source area. The southern lobe is migrating in a southeast direction and appears to follow a paleochannel of the West Fork Trinity River (Figure 2.6) (Parsons, 1998). The paleochannel crosses the flightline and landfill areas of NAS Fort Worth JRB before turning east along White Settlement Road. As explained in Section 2.3.1, the paleochannel consists of higher hydraulic conductivity materials, sands and gravels. These higher conductivities paired with the surrounding bedrock highs make the paleochannel a preferred pathway for the groundwater and any contamination in groundwater.

In 1991, the Fort Worth Corps of Engineers performed an electromagnetic (EM) survey at SWMU 24, also known as Waste Burial Area No. 7 (WP-07), to delineate and identify the locations of buried drums encountered during the installation of utilities through the site. Based on this survey, the Corps of Engineers performed excavation activities to remove a total of 34 drums, of which 9 were partially full, and 25 were empty. Trichloroethylene (TCE) and perchloroethylene (PCE) were the primary constituents contained within the drums.

As part of a current and ongoing RFI at SWMU 24, an electromagnetic survey was performed in May 2000, for the purpose of confirming drum removal activities performed by the Corps of Engineers in 1991. The confirmation survey identified twelve geophysical anomalies caused by buried metal objects. Ten of the anomalies were assessed as having a low to moderate potential for being caused by buried metal objects large enough to be individual or multiple drums. Two of the twelve locations were assessed as having a high potential for being caused by buried metal large enough to be multiple drums.

In July, 2000 IT Corporation began excavation activities at the two locations assessed as having a high potential for buried metal. A total of 16 metal 55-gallon drums were encountered between these two areas. Of the 16 drums, 12 were empty, compressed, or corroded, and contained no liquids. Three of the drums were still in tact and ranged from half full to full of an unknown liquid. Analytical results from characterization sampling are not yet complete, but preliminary results indicate that all three drums contain at least a fraction of TCE. The fourth in tact drum contained a blue, wet, powdery substance. Analytical results from characterization sampling are not yet complete for this unknown powdery substance. Based on the initial intrusive investigation findings, direction was given to excavate the remaining areas with low to moderate potential for being caused by buried metal. Excavation activities at these locations are ongoing, but to date, no drums have been located in the low to moderate potential for buried metal areas.

3.2 OBJECTIVES

Previous field activities conducted by HydroGeoLogic to further define the southern lobe of the basewide TCE plume were completed in three stages: (1) initial screening investigation, (2) well installation and lithological investigation, and (3) three bi-monthly groundwater sampling events of the newly installed wells and two bi-monthly sampling rounds of active groundwater recovery wells. In addition, quarterly groundwater monitoring activities were performed basewide during the same time frame. The following sections provide a description of each field investigation. The results of the investigations are presented in Section 5.0.

3.3 JULY 1998 — SCREENING INVESTIGATION

In late 1997 and 1998 concentrations of TCE in the downgradient groundwater monitoring well, ITMW-01T, for the southern lobe of the TCE plume were detected above the Risk Reduction Standard (RRS)/MCL value of 5 µg/L. As a result of these detections, an Expedited Site Characterization (ESC) was initiated in July 1998 to determine the eastern and southern extent of the TCE plume. During the ESC investigation, DPT methods were used to install 28 borings and 16 piezometers. Sample locations are depicted in Figure 1.2. Groundwater levels were measured with a water level meter at 15 piezometers and 43 monitoring well locations. A total of 58 groundwater samples, nine surface water samples, and eight spring/seep water samples were collected and analyzed. Narrow diameter stainless steel bailers were used to collect groundwater samples with no prior purging of piezometers or monitoring wells. Purging was not performed on monitoring wells so that the resulting data would directly correlate with piezometer data. All samples were analyzed in a mobile laboratory located on site and analyzed for TCE, *cis*-1,2-dichloroethene (*cis*-1,2-DCE), *trans*-1,4-DCE, and vinyl chloride by EPA Method SW8010 using laboratory grade gas chromatography with 10 percent of samples analyzed at a fixed based lab for definitive confirmation.

3.4 JUNE 1999 — SOUTHERN LOBE TCE PLUME DELINEATION

Screening level TCE and DCE analytical data from the July 1998 investigation was used to approximate the locations of additional monitoring wells near the golf course and the Wherry Housing area to achieve delineation of the Southern Lobe TCE groundwater plume. In June and August of 1999, 11 soil borings were advanced in the area. Four soil borings were completed as 2-inch diameter monitoring wells, and five soil borings were completed as 4-inch diameter monitoring wells with the potential to be connected to the groundwater treatment system as recovery wells. The 2-inch polyvinyl chloride (PVC) monitoring wells are WHGLTA020, WHGLTA022, WHGLTA023, and WHGLTA025. The 4-inch PVC wells are WHGLRW015, WHGLRW016, WHGLRW017, WHGLRW018, and WHGLRW019 (Figure 1.2). Two of the borings were not completed as wells, WHGLTA021 and WHGLTA024, because groundwater was not encountered. The nine monitoring wells were developed and three rounds of groundwater samples were collected. The samples were submitted for analysis of VOCs by method SW8260B.

The following sections discuss the rationale for selecting proposed sampling locations to delineate TCE, and provide a summary of the soil boring and well installation events.

3.4.1 Rationale for Sampling Locations

Prior to the Southern Lobe TCE Plume Delineation sampling investigation, the easternmost monitoring well located outside current NAS Fort Worth JRB boundaries was ITMW-01T. This monitoring well is located just northwest of the intersection of Route 183 and White Settlement Road (Figure 1.2). Concentrations of TCE in groundwater samples collected from ITMW-01T exceeded the MCL for TCE (5 μg/L), ranging from 6 μg/L to 21 μg/L during 1998 and 1999. Analytical results from the 1998 ESC investigation indicated the need for additional monitoring wells north, northeast, and south of ITMW-01T to fill in the data gaps along the property boundary. To comply with the AFP 4 ROD, delineation of the extent of the TCE plume exceeding the 5 μg/L MCL is necessary.

Preferred locations along the boundary (both on site and off site of NAS Fort Worth JRB) were selected as possible monitoring well locations. Permission had to be obtained from an off-site property owner and from Texas Department of Transportation (TDOT) to drill along Route 183 outside former CAFB property. Permission was granted from TDOT on July 5, 1999. No permission was obtained from the property owner, which resulted in all offsite wells begin located on TDOT property. The well locations were ultimately identified based on the results of the 1998 ESC investigation, the identification of data gaps near the former CAFB property boundary, and any limiting factors such as utilities and vegetation.

3.4.2 Soil Borings

Eleven soil borings were advanced at the site using a hollow stem auger (HSA) drilling rig. The first nine borings were completed from June 16 to June 22, 1999, WHGLRW015, WHGLRW018, WHGLRW019 WHGLTA020, WHGLTA021, WHGLTA022, WHGLTA023, WHGLTA024, and WHGLTA025. The last two borings, WHGLRW016 and WHGLRW017, were completed on August 17, 1999. Delays with obtaining TDOT clearance prohibited these two borings from being completed during the initial mobilization. Two of the borings, WHGLTA021 and WHGLTA024, were not completed as wells because groundwater was not encountered above the bedrock.

A photoionization detector (PID) was used at each sampling interval and within the breathing zone to identify potentially contaminated soils or potentially dangerous working conditions in accordance with the Health and Safety Plan (HydroGeoLogic, 1999b). The results of the PID readings and soil conditions are discussed in Section 5.2.2.1 and can be found on the soil boring logs included in Appendix C.1.

3.4.3 Monitoring Well Installation and Sampling

Nine soil borings were completed as monitoring wells (Figure 1.2). The following four borings were completed as 2-inch PVC monitoring wells: WHGLTA020, WHGLTA022,

WHGLTA023, and WHGLTA025. The remaining five borings were completed as 4-inch PVC wells which can be converted to recovery wells, if needed. These potential recovery wells are WHGLRW015, WHGLRW016, WHGLRW017, WHGLRW018, and WHGLRW019. Lithological descriptions were recorded at each of these borings to fill in data gaps pertaining to the lithology of this area of NAS Fort Worth JRB.

Well development, which occurred no sooner than 24 hours after installation, was conducted using a bladder pump with the ability to function as a surge block. The wells were pumped until the stabilization parameters were met as outlined in Section 6.1 of the Field Sampling Plan (FSP) (HydroGeoLogic, 1999c). The well development forms are provided in Appendix C.3.

A groundwater sample was collected from each monitoring well, no sooner than 24 hours after development, using the low-flow purge method outlined in the FSP. The sample was submitted for analysis of VOCs by method SW8260B. Monitoring wells WHGLRW016 and WHGLRW017 were installed at a later date therefore were sampled for the first time six weeks later than the other seven wells, but then followed the other well's bi-monthly schedule. Monitoring well WHGLRW015 did not contain enough water to sample using the low-flow purge technique on the first sampling round. The well was sampled three weeks later and then continued on the regular bi-monthly schedule. Monitoring well WHGLTA020 did not contain enough water to sample during the second sampling round. The monitoring wells (with the above exceptions) were sampled in the second weeks of July, September, and the first week of November, 1999 in accordance with the FSP (HydroGeoLogic, 1999c). The analytical results from the bi-monthly sampling events are presented in Section 5.2.2.3.

3.4.4 Recovery Well Sampling

Eleven active groundwater recovery wells were sampled in two bi-monthly rounds for screening analysis of VOCs by method SW8260B. The sampling was performed in September and November 1999. The sampling consisted of collecting grab samples from the sample port located at each recovery well. The analytical results from sampling active groundwater recovery wells are presented in Section 5.2.2.4 (Figure 5.3).

3.5 GROUNDWATER TREATMENT SYSTEM RENOVATIONS

As part of this field investigation and delivery order, HydroGeoLogic refurbished the idle Air Force Groundwater Recovery and Treatment System located south of WP-07. This system was originally installed by the U.S. Air Force in 1993 as an interim remedial action (IRA) for the cleanup of groundwater contamination originating at AFP 4. The groundwater recovery and treatment system began operation in December 1993.

The treatment system extracts groundwater from eleven recovery wells. The extracted groundwater is contaminated with dissolved phase TCE concentrations ranging from 300 ug/L to 4,000 ug/L at the influent to the treatment system. The 150 gallon per minute remediation system consists of five two-stage (upper and lower) low profile strippers set in parallel. Each

stage is equipped with a blower. Submersible pumps extract groundwater from eleven recovery wells. Recovered water (influent) is distributed to the five air stripper units. Influent water is treated by passing through the upper stage first, followed by the lower stage. Stripper effluent is pumped to a carbon adsorption unit for final polishing. Treated effluent water is discharged into a pond along an unnamed creek (a tributary of Farmer's Branch Creek), which is then used to water the Carswell AFB golf course. In 1997 and 1998, the aging remedial system experienced some operation and maintenance problems, carbonate buildup in piping, was not meeting discharge limitations, and was functioning on and off. The decision was made to discontinue operations until the system could be renovated.

HydroGeoLogic began the renovation activities in July 1999 and completed the task in December 1999. The system was operated for three months prior to the transfer to the long term operators (IT Corporation). All VOC NPDES effluent limitations were met following the successful renovations. Approximately 138 pounds of TCE were recovered in the three month operation period

3.6 1999 QUARTERLY GROUNDWATER MONITORING

As a part of the 1999 basewide quarterly groundwater sampling program, several wells in the area of the southern lobe TCE plume were sampled in January, April, July, and October of 1999. The following wells were sampled in the Wherry Housing and Carswell Golf Course area: LF04-02, LF04-4C, LF05-19, LF05-5G, ITMW-01T, WHGLTA003, WHGLTA601, and WJETA535 (Figure 1.2). The following wells were sampled in the flightline area located just west or north of the groundwater treatment system: FT09-12C, HM-123, USGS07T, WHGLTA004, WHGLTA701, WHGLTA704, WP07-10B, and WP07-10C. The results from these sampling events are presented in the Final Basewide Groundwater Sampling and Analysis Program (GSAP), 1999 Annual Report (HydroGeoLogic, 2000). In an effort to provide additional information relating to VOCs in the area of the southern lobe TCE plume, results from these sampling events are included in this report. Information pertaining to the sampling practices and procedures and quality assurance/quality control (QA/QC) can be found in the Basewide GSAP 1999 (HydroGeoLogic, 2000a).

In order to evaluate existing groundwater flow patterns, water level measurements were taken at 280 basewide monitoring wells during the July quarterly sampling event. The monitoring wells were inspected, and both depth to water and total depth of the monitoring well were measured. The water level measurements and total depths were taken several days after purging and sampling of the monitoring wells, to ensure equilibrium conditions. Results from water level measurements are presented in Section 5.1.1.

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Section 4.0

4.0 QUALITY ASSURANCE/QUALITY CONTROL PROGRAM

This section describes the analytical methods and QC program utilized for the Southern Lobe TCE Plume Delineation monitoring events at NAS Fort Worth JRB and provides a data quality evaluation (DQE) of the 1999 groundwater sampling events. The analytical methods used for the collection of data are described in the Final Basewide Quality Assurance Project Plan (QAPP) (HydroGeoLogic, 1998).

4.1 FIELD QUALITY CONTROL

The field QC program for the collection of samples at NAS Fort Worth JRB included specific procedures for the collection of groundwater samples as described in the Basewide GSAP (HydroGeoLogic, 1999b). Sample bottles met U.S. Environmental Protection Agency (EPA) requirements for environmentally clean containers. Sample labels were pre-printed to facilitate sample tracking from the field through the laboratory to the final report. Documentation of sample collection is performed in the field through the laboratory to the final report. Documentation of sample collection is performed in the field to ensure that sample labeling, contaminants of concern, and request for analysis are in agreement and traceable back to the correct field sample. All samples were kept below 4° Celsius at all times. Custody seals were placed on each cooler before shipment by an overnight carrier.

Field QC samples were collected to evaluate sampling technique and decontamination procedures. The samples including ambient blanks, equipment blanks, trip blanks, and field duplicates are described below. A summary of the QC samples, including the number of each type collected as part of the Southern Lobe TCE Plume Delineation sampling events conducted in July, September, and November 1999, are included in Table 4.1.

4.1.1 Ambient Blanks

Ambient blanks consist of American Society for Testing and Materials (ASTM) Type II reagent grade water poured into a VOC sample vial at a sampling site (in the vicinity of the associated samples). Ambient blanks are used to assess the potential introduction of contaminants from upwind sources (e.g., active runways, engine test cells, gasoline motors in operation) to the samples during sample collection. Ambient blanks are handled in an identical manner as environmental samples during transportation, storage, preparation, and analysis.

One set of ambient blanks was collected during the November round of Southern Lobe TCE Plume delineation sampling conducted in 1999. These samples were collected due to the possible interferences from gasoline motors in operation, as the monitoring well is located along a high traffic road, Route 183.

Table 4.1
Field Quality Control Samples Collected for
1999 Southern Lobe TCE Plume Delineation Sampling Events

Type of Sample	Purpose	Frequency	Number	Time	Analysis
Ambient Blank	Used to assess the impact of ambient conditions	1 ambient blank/sampling event	July: 0 Sept.: 0 Nov.: 1 Total: 1	During normal sample collection conditions	VOCs or BTEX and MTBE analyses consistent with the sampling parameters for the associated well
Equipment Blank	Used to assess the effectiveness of equipment decontamination procedures	1 equipment blank/day that equipment is decontaminated	July: 4 Sept.: 2 Nov.: 3 Total: 9	Immediately after equipment decontamination	All laboratory analyses consistent with daily sampling
Trip Blank	Used to assess the potential contaminants from sample containers or other foreign sources during sample transportation and storage	1 trip blank/ sample cooler	July: 4 Sept.: 3 Nov.: 3 Total: 10	When VOCs, BTEX and MTBE, or dissolved gases samples were collected	VOCs, BTEX and MTBE, or dissolved gases analyses consistent with cooler contents
Field Duplicate (blind)	Used to assess sample collection procedures, sample preparation, and improper analytical instrument use	1 duplicate/10 environmental samples	July: 1 Sept.: 1 Nov.: 1 Total: 3	Collected at the same time and location of original sample	Same as original sample

Notes:
BTEX and MTBE - Benzene, toluene, ethylbenzene, xylenes, and methyl *tert*-butyl ether
VOCs - Volatile organic compounds

4.1.2 Equipment Blanks

An equipment blank is a sample of ASTM Type II reagent grade water poured into, poured over, or pumped through a sampling device, collected in a sample container, and transported to the laboratory for analysis. Equipment blanks are used to assess the effectiveness of equipment decontamination procedures. During the Southern Lobe TCE Plume Delineation sampling events, one equipment blank was collected for each type of sample equipment used on each day that equipment decontamination activities occurred. Equipment blanks were collected immediately after the equipment was decontaminated. Since non-dedicated sampling equipment was used at each well, an equipment blank was required each day that sampling events were performed. Each blank was analyzed for all laboratory analyses requested for the environmental samples collected at any associated site on that day. Since each well was only sampled for VOCs, the equipment blanks were, likewise, submitted for analysis of VOCs by method SW8260B.

4.1.3 Trip Blanks

Trip blanks consist of VOC sample vials filled in the laboratory with ASTM Type II reagent grade water, transported to the sampling site, handled as environmental samples, and returned to the laboratory for analysis. The trip blanks are designated in the morning, and carried in the cooler all day with the environmental samples. Trip blanks are not opened in the field and are submitted only when VOC, BTEX and methyl *tert*-butyl ethyl (MTBE), or dissolved gases samples are collected for analysis. Trip blanks are used to assess the potential introduction of contaminants from sample containers, and during sample transportation and storage. For the Southern Lobe TCE Plume Delineation sampling events, a set of trip blanks was required for each sample cooler since all samples were submitted for VOCs analysis.

4.1.4 Field Duplicates

A field duplicate is a second sample collected in the same location as a field sample ("parent" sample). Duplicate samples are collected simultaneously, or in immediate succession, to collection of parent sample, using identical recovery techniques. The parent and duplicate are treated in an identical manner during transportation, storage, preparation, and analysis. For the Southern Lobe TCE Plume Delineation, a total of three field duplicates were collected since one field duplicate was collected for each of the three rounds of sampling. Any data qualification required by duplicates not meeting the precision criteria for the Southern Lobe TCE Plume Delineation event are discussed in Section 4.5, below.

4.2 SAMPLE TRACKING PROTOCOL

Each field sample was assigned a unique identification number that described where the sample was collected. The number consists of a maximum 12-digit alphanumeric code as follows:

xxxxxxxxxzzaa

where:

xxxxxxxxx represents the well identification or well name (e.g., WHGLTA015, ITMW-01T)

zz represents the medium (WG for water-ground)

aa indicates the sampling event number for groundwater, surface water, and soil (e.g., 01, 02, 03, etc.)

For example, the groundwater sample collected during the third sampling event from WHGLTA015 would be identified as "WHGLTA015WG03."

In order to ensure that field duplicates were analyzed 'blind' by the laboratory, each field duplicate sample was assigned a unique sample identification number that did not associate the duplicate with its parent sample. The locations from which field duplicate samples were to be collected were determined prior to mobilization. Documentation was maintained in the field sampling log book, and on the sample collection log, to track these field duplicate samples. For example, a blind duplicate groundwater sample collected during the third round of sampling would be identified as DUP01WG03.

QC samples were identified by use of a similar system of identifiers with a maximum of 10 characters. The QC sampling number system is summarized below:

xxmmddyy

where:

xx represents the medium (EB for equipment blank, TB for trip blank, AB for ambient blank)

mmddyy represents the date (month, day, year)

For example, an equipment blank obtained on September 12, 1999, would be identified as EB091299.

The Project Geologist/Field Coordinator maintained a list detailing the connection between each QC sample and specific environmental sample. For instance, each trip blank was correlated with a particular set of samples shipped to the laboratory, and each equipment blank was correlated to those samples collected on a specific date, using a particular set of sampling tools.

After the laboratory data were received and validated, data entry and QC operations were performed on the laboratory's electronic data deliverables (EDDs) to ensure that each EDD was complete, correct, and compliant with the Environmental Resources Program Information

Management System (ERPIMS) format. An EDD report in the ERPIMS format is being prepared for submission to AFCEE.

For the purpose of this report, samples will be referred to by their LOCIDs (the well identification or well name) and will not contain the suffix "WG03." The suffix of "DL" is applied to indicate a sample result reported from a diluted analysis, and the suffix "RE" indicates a sample result reported from a reanalysis.

4.3 LABORATORY QUALITY CONTROL

The laboratory QC program, including sample handling, laboratory QC elements, and data reporting, is fully documented in the Final Basewide QAPP (HydroGeoLogic, 1998). Sample handling includes documentation of sample receipt, placement in storage, controlled sample access, and disposal. For VOC analyses by Method SW8260B, laboratory QC elements consist of instrument calibration and tuning, internal standards, laboratory control samples (LCSs), method blanks, and matrix spike/matrix spike duplicate (MS/MSD) samples. Reporting of the laboratory control data was planned prior to the collection of the data, allowing the laboratory to place the appropriate information into each data package so that the DQE could be performed in a timely manner.

4.4 QUALITY CONTROL ELEMENTS

The basis for assessing each element of data quality (precision, accuracy, representativeness, completeness, and comparability) is discussed in the following subsections.

4.4.1 Precision

Precision measures the reproducibility of measurements. It is strictly defined as the degree of mutual agreement among independent measurements as the result of repeated application of the same process under similar conditions. Analytical precision is the measurement of the variability associated with duplicate (two) or replicate (more than two) analyses. Total precision is the measurement of the variability associated with the entire sampling and analysis process, and is determined by analysis of duplicate or replicate field samples and measures variability introduced by both the laboratory and field operations. Field duplicate samples and MSD samples were analyzed to assess field and analytical precision, and the precision measurement was determined using the relative percent difference (RPD) between the duplicate sample results. For replicate analyses, the relative standard deviation was determined. Acceptable values for precision for each analyte are listed by analysis method in the Final Basewide QAPP (HydroGeoLogic, 1998).

4.4.2 Accuracy

Accuracy is a statistical measurement of correctness and includes components of random error (variability due to imprecision) and system error. It therefore reflects the total error associated with a measurement. A measurement was accurate when the value reported did not differ from

the true value or known concentration of the spike or standard. Analytical accuracy was measured by comparing the percent recovery (%R) of analytes spiked into an LCS to a control limit. For most organic analytical methods, surrogate compound recoveries were also used to assess accuracy and method performance for each sample analyzed. Analysis of performance evaluation (PE) samples were also used to provide additional information for assessing the accuracy of the analytical data being produced.

Both accuracy and precision were calculated for each analytical batch, and the associated sample results were interpreted by considering these specific measurements. The formula for calculation of accuracy is %R from pure and sample matrices. Acceptable values for %R for each analyte are listed by analytical method in the Final Basewide QAPP (HydroGeoLogic, 1998). Accuracy and precision for the Southern Lobe TCE Plume Delineation sampling events are discussed in Section 4.5 of this report.

4.4.3 Representativeness

Objectives for representativeness were defined for each sampling and analysis task and were a function of the investigative objectives. Representativeness was achieved through use of the standard field, sampling, and analytical procedures. Representativeness was also determined by appropriate program design with consideration of elements such as proper sampling locations.

The same sampling locations were maintained during the three bi-monthly rounds of groundwater sampling conducted for the Southern Lobe TCE Plume Delineation activities.

4.4.4 Completeness

Completeness was calculated for the aggregation of data for each analyte measured for any particular sampling event or other defined set of samples. The number of valid results divided by the number of possible individual analyte results, expressed as a percentage, determines the completeness of the data set. In evaluating sampling event completeness, valid results were all results not qualified with an "R" qualifier (see Table 4.2 for an explanation of qualifiers used). The project requirements for completeness is 95 percent for aqueous samples. For any instances of samples that could not be analyzed for any reason (holding time violations in which resampling and analysis were not possible, samples spilled or broken, etc.), the numerator of this calculation becomes the number of valid results minus the number of possible results not reported.

The formula for calculation of completeness follows:

$$\% \text{ completeness} = \frac{\text{number of valid (i.e., non-R qualified) results}}{\text{number of possible results}}$$

The three 1999 sampling events generated a total of 2,030 data points (from environmental samples and field duplicates); 1,993 of these data points were considered usable. Overall project completeness was calculated to be 98.2%, which meets project completeness

requirements. Completeness calculated on a per-sampling event and per-analyte basis is evaluated in the discussion of individual analytical method subsections in Section 4.5. All rejected and missing data points are summarized in Table 4.3. Overall completeness for each analyte with rejected data is also presented in Table 4.3. All other analytes have a completeness of 100%.

4.4.5 Comparability

Comparability is the confidence with which one data set can be compared to another data set. The objective for this QC program is to produce data with the greatest possible degree of comparability. The number of matrices that are sampled and the range of field conditions encountered are considered in determining comparability. Comparability is achieved by using standard methods for sampling and analysis, reporting data in standard units, normalizing results to standard conditions and using standard and comprehensive reporting formats. Complete field

Table 4.2
Data Qualifiers

Qualifiers[1]	Positive Results	Negative Results
Qualifiers for Data Within Acceptance Limits (Usable as Reported)		
(no qualifier)	The result is a detection with the indicated value and units. (Use datum without qualification)	(Not applicable)
U	(Not applicable)	The analyte was analyzed for, but not detected. The associated numerical value is at the PQL. (Use datum without qualification.)
Qualifier for Data Within Action Limits (Usable with Qualification)		
F	The analyte was positively identified, but the associated numerical value is below the PQL.	(Not applicable)
J	The analyte was positively identified, the quantitation is an estimation.	(Not applicable)
UJ	(Not applicable)	The analyte was not detected; the associated numerical value is a PQL which is estimated due to deficiencies in the QC data.
Qualifiers for Data Outside of Action Limits (Unusable)		
R	The datum is unusable due to serious deficiencies in the ability to meet QC criteria.	The datum is unusable due to serious deficiencies in the ability to meet QC criteria.

Notes:

[1] If a combination of QC results suggest contradictory qualifiers, the following hierarchy is used to select the appropriate qualifier to assign:

R > UJ > U > F > J > (no qualifier)

PQL - Practical quantitation limit
QC - Quality control

Table 4.3
Data Quality Evaluation and Result Rejection Summary

Monitoring Well	Bromochloro-methane	1-Chlorohexane	Chloromethane	2,2-Dichloro-propane	*trans*-1,2-Dichloroethene	*trans*-1,3-Dichloro-propene	Dichloro-difluoromethane	Methylene chloride	1,1,2-Trichloro-ethane	Trichloro-fluoromethane
Round 1 - July										
DUP01		CC								
WHGLRW016	CC	CC		CC		CC	CC	CC	CC	
WHGLRW017	CC	CC		CC		CC	CC	CC	CC	
WHGLRW018		CC								
WHGLRW019		CC								
WHGLTA023		CC								
Round 2 - September										
DUP01			CC				CC			
Round 3 - November										
DUP01								CC		CC
WHGLRW015								CC		
WHGLRW016								CC		CC
WHGLRW017								CC		CC
WHGLRW019					CC, LCS			CC		
WHGLTA020								CC		CC
WHGLTA022								CC		CC
WHGLTA023					CC, LCS			CC		
WHGLTA025								CC		CC
Data Summary										
Total Rejections	2	6	1	2	2	2	3	11	2	6
Total Results	33	33	33	33	33	33	33	33	33	33
Percent Complete	93.9	81.8	97.0	93.9	93.9	93.9	90.9	66.7	93.9	81.8

Notes:
CC - The designated sample result was rejected because of high continuing-calibration verification percent difference (%D).
LCS - The designated sample result was rejected because of a low laboratory control sample recovery (%R).

documentation using standardized data collection forms supports the assessment of comparability. Analyses of performance evaluation samples and reports from audits are used to provide additional information for assessing the comparability of analytical data produced among subcontracting laboratories. Historical comparability is achieved through consistent use of methods and documentation procedures throughout the project.

4.5 DATA QUALITY EVALUATION

This section describes the analytical methods and QC program utilized for the Southern Lobe TCE Plume Delineation groundwater sampling events at NAS Fort Worth JRB. The analytical

methods used for the analysis of the field samples are described in the Final Basewide QAPP (HydroGeoLogic, 1998).

The objective of the DQE is to provide a professional review of the analytical data packages submitted by the laboratory. The DQE consists of a review of laboratory QC data and field QC data to determine which data are usable, usable with qualification, or unusable. The analytical procedures used to generate field sample data are evaluated in accordance with the general and method specific QC criteria listed in Sections 5.0, 6.0, 7.0, and 8.0 of the Final Basewide QAPP (HydroGeoLogic, 1998). The DQE for each sampling event is presented in the subsections below. Each subsection summarizes those results which have been found to be unusable and those results which are usable with qualification.

Some analytes will have more than one qualifier assigned due to multiple QC issues with that result. In such cases, the most severe qualifier is assigned; the other qualifiers are considered to be overridden and are not discussed in the method DQE.

Note that some samples have more than one analysis, due to reanalysis for dilution or QC issues. Where multiple analyses are available for a sample, the DQE discusses only QC issues affecting the definitive result for each analyte in that sample. The definitive result is determined by evaluating the hierarchy of data qualifiers (with the lower priority qualifier indicating a 'better' result), practical quantitation limits (PQLs), and calibrated range.

The following items of laboratory QC data are reviewed:

1. Sample integrity
2. Sample completeness
3. Preparation and analysis holding times
4. Laboratory preparation and analysis methods
5. Method accuracy and precision (MS/MSDs)
6. Laboratory performance criteria (method blanks, LCS recoveries, surrogates, internal standards)
7. Instrument initial and continuing calibration checks
8. Chain of Custodies (COCs) (should be clear and legible, and should include receiving signature from the laboratory)

Field QC performance is evaluated through evaluating field duplicates, field blanks, field documentation, and shipping criteria.

4.5.1 Round 1 - July 1999

A total of 10 groundwater samples, 1 duplicate sample, and 8 field QC samples were analyzed for VOCs by method SW8260B. A total of 78 VOC compounds were analyzed. A total of 688 VOC results were generated by field samples and duplicate samples, of which 18 results were rejected. Overall completeness of the VOC results was calculated to be 97.4%. Seven compounds did not meet the completeness goal of 95%. 1-Chlorohexane had a completeness

of 45.5%; bromochloromethane, 2,2-dichloropropane, *trans*-1,3-dichloropropene, dichlorodifluoromethane, methylene chloride, and 1,1,2-trichloroethane each had a completeness of 81.8%. All 71 other compounds were 100% complete and met the project completeness goal. All result rejections (with a reason code) are presented in Table 4.3.

The remaining data results are usable with qualification as described below.

An MS/MSD pair was collected from WHGLTA022. Due to a high percent recovery (%R) for naphthalene, the detections in samples WHGLTA023 and WHGLTA025 were qualified "J" (note that the result in WHGLTA025 was further qualified for trip blank contamination).

Due to contamination in the associated trip blank, the naphthalene detection in sample WHGLTA023 was qualified "U". As this result already had a "J"-qualifier due to MS/MSD %R, the final qualifier applied to this result is "UJ".

Sample WHGLRW015 was mistakenly submitted to the Severn Trent Laboratories (STL)-Baltimore laboratory. This laboratory has been used to analyze other samples from NAS Fort Worth using the Final Basewide QAPP criteria and there should be no impact on data comparability; however STL-Baltimore reported 17 additional VOCs on the reported analyte list, and those data have been included in the discussion above.

4.5.2 Round 2 - September 1999

A total of 10 groundwater samples, 1 duplicate sample, and 5 field QC samples were analyzed for VOCs by method SW8260B. A total of 61 VOC compounds were analyzed. A total of 671 VOC results were generated by field samples and duplicate samples, of which 2 results were rejected. Overall completeness of the VOC results was calculated to be 99.7%. Two compounds did not meet the completeness goal of 95%; chloromethane and dichlorodifluoromethane each had a completeness of 90.9%. All 59 other compounds were 100% complete and met the project completeness goal. All result rejections (with a reason code) are presented in Table 4.3.

The remaining data results are usable without further qualification.

Samples WHGLRW018, WHGLTA020, and WHGLTA022 were submitted without an associated equipment blank. There were no detections in any of these samples, so there is no need to assess the effect of cross-contamination.

4.5.3 Round 3 - November 1999

A total of 10 groundwater samples, 1 duplicate sample, and 6 field QC samples were analyzed for 61 VOC compounds by method SW8260B. A total of 671 VOC results were generated by field samples and duplicate samples, of which 17 results were rejected. Overall completeness of the VOC results was calculated to be 97.5%. Three compounds did not meet the completeness goal of 95%; *trans*-1,2-DCE had a completeness of 81.8%, methylene chloride

had a completeness of 18.2%, and trichlorofluoromethane had a completeness of 45.5%. All 58 other compounds were 100% complete and met the project completeness goal. All result rejections (with a reason code) are presented in Table 4.3.

An MS/MSD pair was collected from WHGLRW019. Due to a low %Rs, the results for 1,1-DCE, *trans*-1,2-DCE, styrene, and 1,2,4-trimethylbenzene were qualified "UJ" in samples WHGLRW019, WHGLTA023, WHGLRW015, and DUP01. Note that the final qualifier for *trans*-1,2-DCE in samples WHGLRW019 and WHGLTA023 is "R" due to calibration discrepancies.

Samples WHGLRW016, WHGLRW017, and WHGLTA022 were submitted without an associated equipment blank. There were no detections in any of these samples, so there is no need to assess the effect of cross-contamination.

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Section 5.0

5.0 FIELD AND ANALYTICAL RESULTS

The physical and chemical data collected during 1998 ESC screening investigation, the 1999 monitoring well installation, Southern Lobe TCE Plume Delineation groundwater sampling, and active recovery well sampling are provided in the following sections. In addition, relevant results from 1999 quarterly groundwater sampling events at monitoring wells located in the south/southeastern area of the former CAFB property are provided for additional background information.

5.1 CONTAMINANT EVALUATION

To facilitate the discussion of TCE contamination at NAS Fort Worth JRB, levels of contamination determined from analytical sampling were compared to several threshold values. The results of the organic analyses were compared to the method quantitation limits (MQLs). These comparisons identified locations where contamination is likely, and monitoring should be continued to provide further characterization. In addition, all organic constituent concentrations, were compared to the Texas Natural Resource Conservation Commission (TNRCC) Risk Reduction Standard (RRS) 2 values. Comparison of contaminant concentrations to their respective RRS 2 value provides a basis for risk assessment. Concentrations of contaminants that exceed their respective RRS 2 values indicate areas where continued monitoring or remedial action may be necessary. The MCLs and RRS 2 values have equivalent values for the chemicals of concern (TCE, DCE, vinyl chloride,etc.) in this investigation.

5.1.1 Detection and Quantitation Limits

A PQL is the lowest analytical result level that can be reasonably achieved within specified limits of precision and accuracy during routine laboratory operations. Each PQL value is higher than the associated method detection limit (MDL), which is the minimum concentration of a substance that can be measured and reported with 99 percent confidence the analyte concentration is greater than zero. Both MDLs and PQLs are adjusted for sample-specific conditions such as moisture, subsample mass, and dilution. Sample concentrations falling between the sample-specific MDL and sample-specific PQL are assigned an "F" qualifier indicating the variability of the result (HydroGeoLogic, 1999d). In July 1998, the TNRCC issued an Interoffice Consistency Memorandum (TNRCC, 1998a), followed in September 1998 by an Erratum Sheet (TNRCC, 1998b). The Consistency Memorandum defined a MQL as the demonstrated lower limit of the linear range for that analyte. As defined, an analyte's MQL is analogous to the PQL reported by the laboratory without adjustment for sample-specific conditions. The Erratum Sheet also defined an analyte sample quantitation limit (SQL) as that analyte's MDL adjusted for sample-specific conditions.

5.1.2 Risk Reduction Standard 2

RRS 2 values are the chemical-specific cleanup levels for remediation contaminated by a release(s) from a Solid Waste Management Unit (SWMU) or Area of Concern (AOC). These

values are established from health-based standards and criteria (Texas and/or Federal) pursuant to TNRCC Regulations, 30 Texas Administrative Code (TAC) 335.551-335.569. If the MQL or background concentration for a given chemical is greater than the RRS 2 level, either the MQL or the background value, whichever is greater, is to be used for determining compliance with requirements of the groundwater remediation. If RRS 2 values are not available or do not provide appropriate protection for human health or the environment, cleanup levels based on other numeric criteria, referred to as medium specific concentrations (MSCs), must be established. Formulas to develop MSCs, based on exposure factors and pathways and chemical-specific toxicity, are provided in 30 TAC 335.558. RRS 2 values for organic compounds in groundwater are provided in Table 5.1.

Table 5.1
Risk Reduction Standard 2 Values
for Organic Compounds in Groundwater

VOC	RRS 2 Value (µg/L)	RRS 2 Value Source[1]
1,1-Dichloroethene	7	TNRCC
2-Methylnaphthalene	4,100	TNRCC
Benzene	5	TNRCC
Bis(2-Ethylhexyl)phthalate	26	TNRCC
Chlorobenzene	100	TNRCC
Chloroform	100	TNRCC
cis-1,2-Dichloroethene	70	TNRCC
Ethylbenzene	700	TNRCC
Isopropylbenzene (cumene)	10,000	TNRCC
m-Xylene & *p*-xylene	10,000	Derived
Methyl *tert*-butyl ether	1,000	TNRCC
n-Butylbenzene	1,000	Derived
n-Propylbenzene	10,000	Derived
Naphthalene	2,000	TNRCC
o-Xylene	10,000	TNRCC
Isopropylbenzene	10,000	TNRCC
p-Isopropyltoluene (*p*-cymene)	1,000	Derived
sec-Butylbenzene	1,020	Derived
tert-Butylbenzene	1,020	Derived
Tetrachloroethene	5	TNRCC
Toluene	1,000	TNRCC
trans-1,2-Dichloroethene	100	TNRCC
Trichloroethene	5	TNRCC
Trichlorofluoromethane	31,000	TNRCC
1,2,4-Trimethylbenzene	5,100	Derived
1,3,5-Trimethylbenzene	5,100	Derived
Vinyl chloride	2	TNRCC

Notes:
[1] Source of all values was Texas Natural Resource Conservation Commission (TNRCC) Risk Reduction Standards 2 (30 TAC 335). Those noted as "Derived" were derived based on procedures presented in the regulations.

5.2 FIELD RESULTS

5.2.1 July 1998 - Groundwater Screening Investigation

As part of the July 1998 ESC investigation, soil, groundwater, and surface water samples were collected from the area in the southern and southeastern portion of the former CAFB property. Samples were analyzed for *cis*-1,2-DCE, *trans*-1,4-DCE, TCE, and vinyl chloride by a mobile laboratory. Samples were intended for use as screening data and not definitive data. The sampling locations and the results of the screening analytical data from surface and groundwater samples collected during the July 1998 investigation are presented in Figure 5.1 for TCE and Figure 5.2 for *cis*-1,2-DCE.

The boring logs from the 1998 DPT screening investigation are included in Appendix A.1 and a summary of boring information is provided by Table 5.2. Twenty-one soil samples were collected from 10 soil borings and submitted for analysis as described above. The mobile laboratory results are provided in Appendix B. None of the analytes tested were detected in the soil samples. Surface water samples were collected from several locations and the results are presented in Table 5.3 (Figures 5.1 and 5.2). The general trend was a decrease in the concentrations of the chemicals of concern with the flow of groundwater and surface water from west to east. The exception to this was the detection of TCE and *cis*-1,2-DCE from locations Spring-2 and Spring-4. Although the detections were below the TNRCC's RRS 2 Values developed for the basewide TCE plume, the results indicated the need for additional monitoring wells in the area north and east of ITMW-01T (Figure 5.2).

Groundwater samples were collected from 15 temporary piezometers using bailers. The concentrations of analytes detected are presented in Table 5.4. Elevated levels of TCE were detected at B-25 and B-26 which is west of the boundary and within the Phytoremediation Area (Figure 5.1). Levels of TCE detected at B-1, B-6, B-12, B-21, and B-23 at levels above the MQL indicated the need for additional monitoring wells to monitor the possible migration of the chemicals of concern into Farmers Branch Creek past the current Base property boundary.

Groundwater samples were collected from 38 existing monitoring wells located in and around the study area (Table 5.5). These previously installed monitoring wells were not purged prior to sampling and the samples were collected with a bailer; therefore, data should be considered for screening value only. The sample results using the no purge/bailer method were similar to the results July 96 quarterly sampling using low flow purge with the exception of the samples collected at WP07-10C. The low flow purge method produced a result of 1000 μg/L for TCE consistent with preview results, while the bailer method resulted in a TCE detection of 147 μg/L.

Results of this ESC investigation demonstrate that the southern lobe of the TCE plume can be subdivided into two lobes which are bisected by Farmers Branch Creek (Figure 5.1). Although Farmers Branch Creek is the primary receptor of the TCE plume, concentrations of TCE decrease as the lobes approach Farmers Branch Creek.

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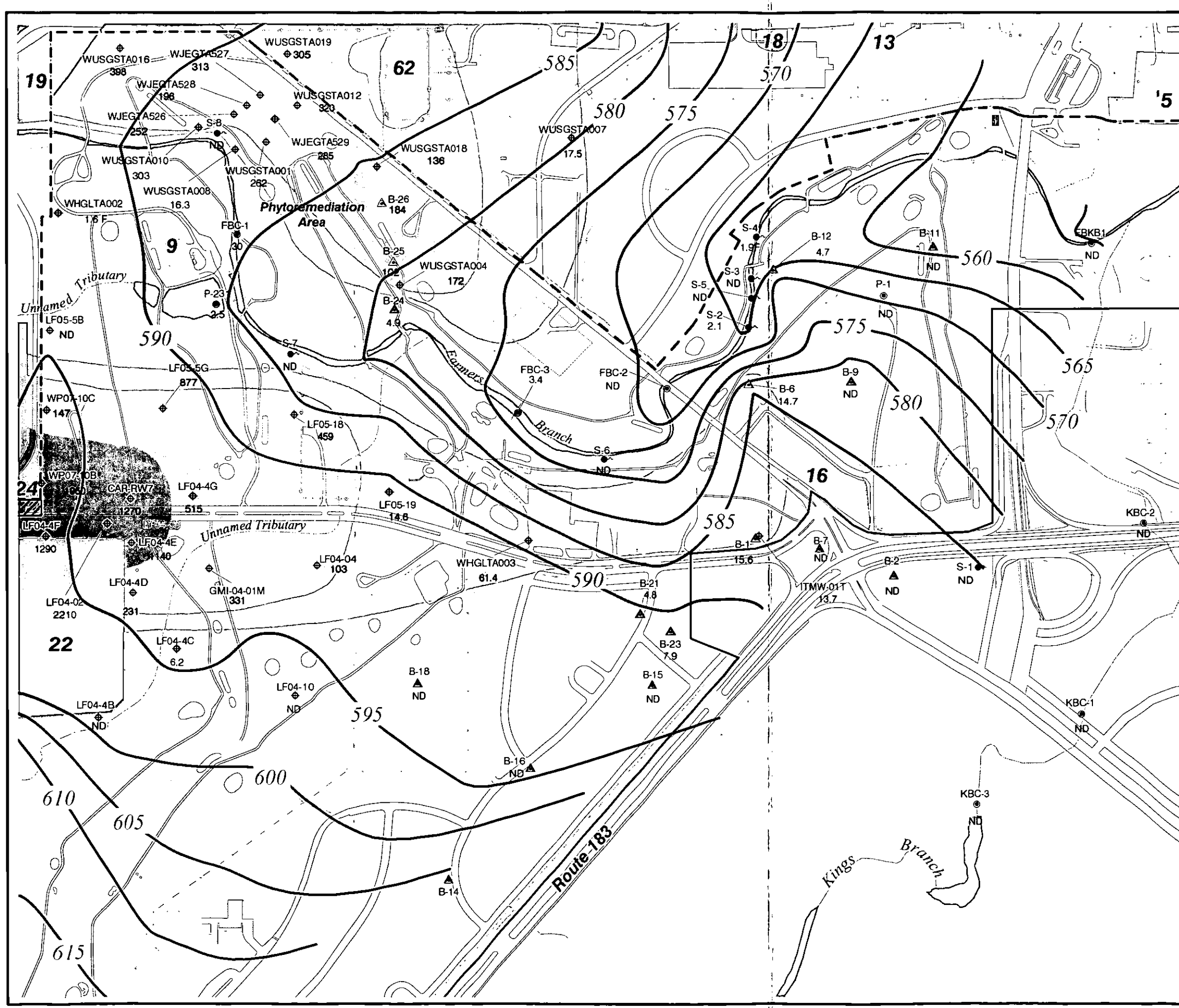

HydroGeoLogic, Inc.
Southern Lobe TCE Groundwater Plume Delineation
NAS Fort Worth JRB, Texas

Figure 5.1
1998 Trichloroethene Concentrations in Groundwater and Surface Water

U.S. Air Force Center for Environmental Excellence

Legend

- NAS Fort Worth JRB (Carswell Field)
- Former Carswell Air Force Base
- 580 Groundwater Elevation (Feet above MSL)
- Trichloroethene Concentration Contours
  - 1-10 µg/L
  - 100-1000 µg/L
  - 10-100 µg/L
  - +1000 µg/L
- 1998 Groundwater Sample Monitoring Well Locations
- 1998 Surface Water Sample Locations
- 1998 Spring Sample Locations
- 1998 Temporary Piezometer Locations
- 103 TCE Concentration in µg/L
- Solid Waste Management Unit (SWMU)
- Area of Concern (AOC)
- Groundwater Treatment System

Note: All data should be considered nondefinitive screening data. All groundwater samples were collected with a bailer.

ND - Not Detected

F - The estimated detection between adjusted MDL and adjusted MQL.

N

300 0 300 600
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Created: 01/11/00 jbelcher
Revised: 07/26/00 jb
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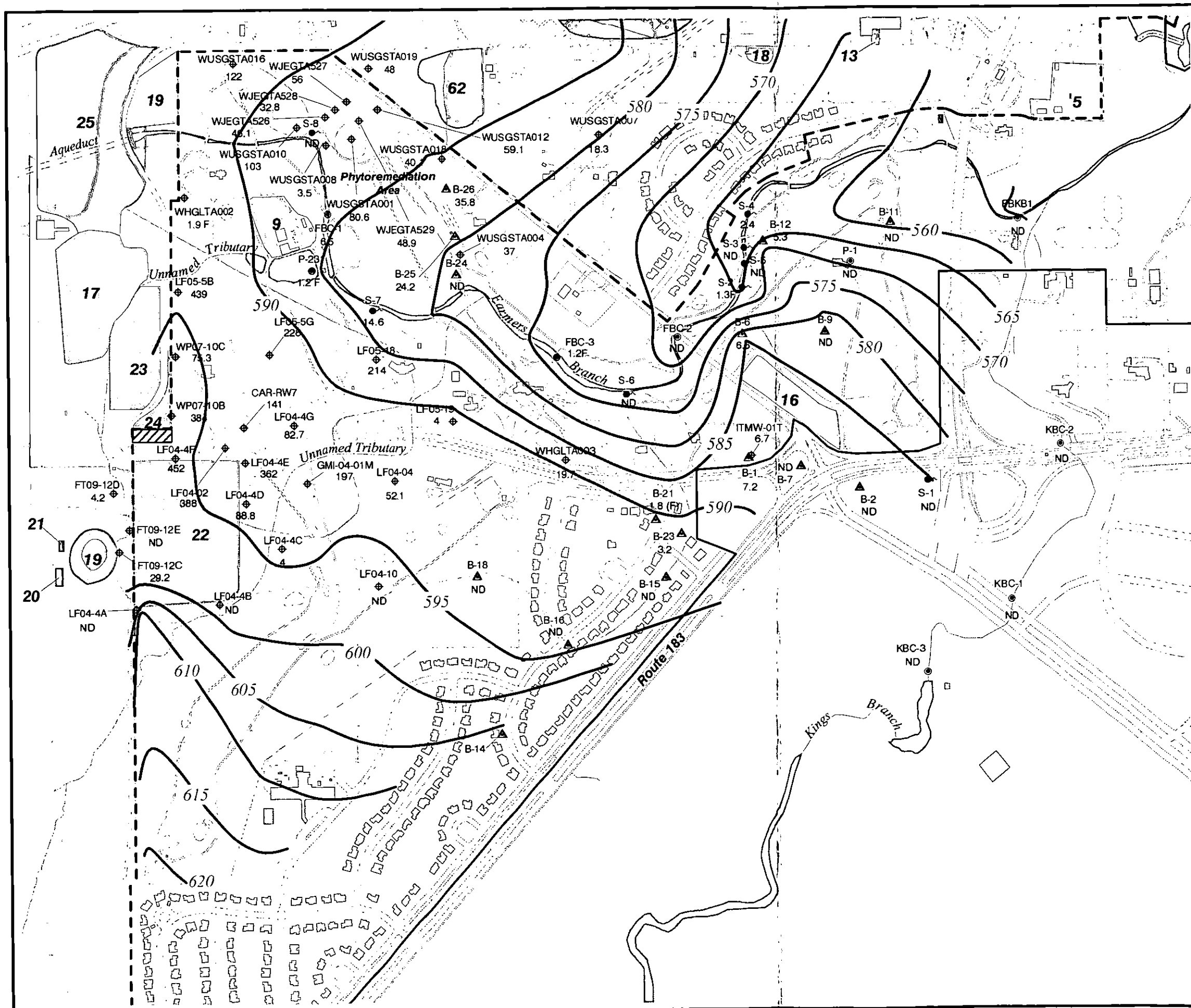

HydroGeoLogic, Inc.
Southern Lobe TCE Groundwater Plume Delineation
NAS Fort Worth JRB, Texas

Figure 5.2
1998 *cis*-1,2-Dichloroethene Concentrations in Groundwater and Surface Water

U.S. Air Force Center for Environmental Excellence

Legend

- NAS Fort Worth JRB (Carswell Field)
- Former Carswell Air Force Base
- -580- Groundwater Elevation (Feet above MSL)
- *cis*-1,2-Dichloroethene Concentrations
  - 0.5-70 µg/L
  - 70 µg/L
- Solid Waste Management Unit (SWMU)
- Area of Concern (AOC)
- Groundwater Treatment System
- 1998 Groundwater Sample Monitoring Well Locations
- 1998 Surface Water Sample Locations
- 1998 Spring Sample Locations
- 1998 Temporary Piezometer Locations
- 88.8 *cis*-1,2-DCE Concentration in µg/L

Note: All data should be considered nondefinitive screening data. All groundwater samples were collected with a bailer.

F - The estimated detection between adjusted MDL and adjusted MQL.

ND - Not detected

N

400 0 400 800
SCALE IN FEET

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Project: AFC001-19CD
Created: 01/11/00 jbelcher
Revised: 07/27/00 jb
Map Source: HGL ArcView GIS Database

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Table 5.2
July 1998 Screening Investigation
Well Construction and Boring Information Summary

Location	Screen Length (ft)	Screened Interval* (ft)	Depth to Water (ft)	TOC (ft)	Depth of Well (ft)	Depth to Bedrock (ft)	Soil Sample Interval (ft)	
B-1	5.0	17.0 - 22.0	14.80	1.33	22.0	22.0	18.5 - 19.0	21.5 - 22.0
B-2	10.0	8.5 - 17.5	10.00	1.44	17.5	17.5	11.0 - 11.5	13.5 - 14.0
B-6	5.0	15.0 - 20.0	16.80	1.30	20.0	22.0	16.0 - 16.5	19.5 - 20.0
B-7	5.0	14.0 - 19.0	15.34	1.34	19.0	19.0	15.0 - 15.5	18.5 - 19.0
B-9	5.0	17.0 - 22.0	16.80	1.00	22.0	refusal at 22	16.0 - 16.5	18.0 - 18.5
B-12	5.0	11.0 - 16.0	9.04	1.38	16.0	13.3	10.5 - 11.0	21.0 - 21.5
B-14	5.0	19.0 - 24.0	dry	NA	24.0	22.5	NA	NA
B-15	5.0	26.5 - 31.5	18.44	0.80	31.5	refusal at 31.5	21.0 - 21.5	27.0 - 27.5
B-16	5.0	23.0 - 28.0	20.56	1.36	28.0	28.0	21.0 - 21.5	24.0 - 24.5
B-18	5.0	28.0 - 33.0	27.89	1.72	33.0	38.5	27.0 - 27.5	30.0 - 30.5
B-21	5.0	20.0 - 25.0	14.96	0.94	25.0	refusal at 25.0	18.0 - 18.5	NA
B-23	5.0	18.0 - 23.0	15.46	1.40	23.0	23.0	NA	NA
B-24	5.0	3.0 - 8.0	4.27	1.34	8.0	8.0	NA	NA
B-25	5.0	7.5 - 12.5	11.61	1.27	12.5	12.5	NA	NA
B-26	5.0	9.0 - 14.0	13.37	1.00	14.0	14.0	NA	NA
B-10	abandoned		dry	NA	NA	refusal at 5	NA	NA
B-11	abandoned		dry	NA	NA	refusal at 15.5	14.5 - 15.0	NA
B-13	abandoned		dry	NA	NA	12.8	NA	NA
B-17	abandoned		dry	NA	NA	10.5	NA	NA
B-19	abandoned		dry	NA	NA	refusal at 4.0	NA	NA
B-20	abandoned		dry	NA	NA	refusal at 4.0	NA	NA
B-22	abandoned		dry	NA	NA	refusal at 10.0	NA	NA
B-27	abandoned		dry	NA	NA	refusal at 6.0	NA	NA
B-28	abandoned		dry	NA	NA	refusal at 9.0	NA	NA
B-3	abandoned		dry	NA	NA	refusal at 8.5	NA	NA
B-4	abandoned		dry	NA	NA	refusal at 7.5	NA	NA
B-5	abandoned		dry	NA	NA	refusal at 8.0	NA	NA
B-8	abandoned		dry	NA	NA	refusal at 5.0	NA	NA

Notes:
TOC - top of casing
NA - not applicable
ft - feet
Source: Field data from July 1998 direct push technology (DPT) screening investigation

Table 5.3
July 1998 Screening Investigation
Analytical Results of Surface Water Samples

Sample Location	Analyte (µg/L)			
	cis-1,2-Dichloroethene	*trans*-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride
FBC-1	6.5	ND	30	ND
FBC-2	ND	ND	ND	ND
FBC-3	1.2 F	ND	3.4	ND
FBKB1	ND	ND	ND	ND
KBC-1	ND	ND	ND	ND
KBC-2	ND	ND	ND	ND
KBC-3	ND	ND	ND	ND
Pond-1	ND	ND	ND	ND
Pond-231 (P-231)	1.2 F	ND	2.5	ND
Spring-1 (S-1)	ND	ND	ND	ND
Spring-2 (S-2)	1.3 F	ND	2.1	ND
Spring-3 (S-3)	ND	ND	ND	ND
Spring-4 (S-4)	2.4	ND	1.9 F	ND
Spring-5 (S-5)	ND	ND	ND	ND
Spring-6 (S-6)	ND	ND	ND	ND
Spring-7 (S-7)	14.6	ND	ND	ND
Spring-8 (S-8)	ND	ND	ND	ND

Notes:
Samples were intended for screening purposes and not as definitive data.
F - analyte was detected between the PQL and the reporting limit
ND - not detected

Table 5.4
July 1998 Screening Investigation
Analytical Results of Groundwater Samples
Collected from Temporary Piezometers

Sample Location	Analyte (µg/L)			
	cis-1,2-Dichloroethene	*trans*-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride
B-1	7.2	1.5 F	15.6	ND
B-2	ND	ND	ND	ND
B-6	6.6	ND	14.7	ND
B-7	ND	ND	ND	ND
B-9	ND	ND	ND	ND
B-11	ND	ND	ND	ND
B-12	5.3	2.2	4.7	ND
B-15	ND	ND	ND	ND
B-16	ND	ND	ND	ND
B-18	ND	ND	ND	ND
B-21	1.8 F	ND	4.8	ND
B-23	3.2	ND	7.9	ND
B-24	ND	ND	4.9	ND
B-25	24.2	ND	102	ND
B-26	35.8	ND	184	ND

Notes:
Grab samples were collecting using disposable bailers. Data was intended for screening purposes and not as definitive data.
F - analyte was detected between the PQL and the reporting limit
ND - not detected

Table 5.5
July 1998 Screening Investigation
Analytical Results of Groundwater Samples Collected from Monitoring Wells

Sample Location	Analyte (µg/L)				Depth to Water (ft below toc)
	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride	
CAR-RW07	141	8.2	1270	ND	25.38
FT09-12C	29.2	ND	1.7 F	5.4	32.50
FT09-12D	4.2	ND	10.8	ND	31.04
FT09-12E	ND	ND	ND	ND	31.55
GMI-04-01M	197	149	331	ND	20.46
LF04-02	388	17	2210	5.2	29.29
LF04-04	52.1	2.5	103	ND	19.31
LF04-10	ND	ND	ND	ND	30.00
LF04-4A	ND	ND	ND	ND	14.68
LF04-4B	ND	ND	ND	ND	21.79
LF04-4C	4	1.1 F	6.2	ND	19.34
LF04-4D	88.8	2.9	231	5.9	21.08
LF04-4E	362	11.4	1140	4.8	24.47
LF04-4F	452	22.9	1290	6.8	30.10
LF04-4G	82.7	3	515	ND	26.72
LF04-4H	--	--	--	--	dry
LF05-14	--	--	--	--	dry
LF05-18	214	41.5	459	26.5	19.33
LF05-19	4	ND	14.6	ND	14.56
LF05-5B	439	7.5	ND	83.8	5.63
LF05-5G	228	20.2	877	18.7	21.76
LF05-5H	--	--	--	--	dry
ITMW-01T	6.7	1.3 F	13.7	ND	13.21
WHGLTA002	1.9 F	ND	1.6 F	ND	14.50
WHGLTA003	19.7	ND	61.4	ND	22.23
WJEGTA526	46.1	ND	252	ND	8.95
WJEGTA527	56	ND	313	ND	9.54
WJEGTA528	32.6	ND	196	ND	8.77
WJEGTA529	48.9	ND	285	ND	9.25
WP07-10B	384	29.4	1950	7.8	28.60
WP07-10C	75.3	7.5	147	32.9	21.68
WUSGSTA001	80.6	ND	262	ND	9.16
WUSGSTA002	--	--	--	--	dry
WUSGSTA004	37	ND	172	ND	8.58
WUSGSTA007	18.3	6.9	17.5	ND	9.61
WUSGSTA008	3.5	ND	16.3	ND	9.34
WUSGSTA010	103	3.5	303	3.1	3.08
WUSGSTA012	59.1	ND	320	ND	10.53
WUSGSTA016	122	ND	398	ND	7.91
WUSGSTA018	40.1	2.4	136	ND	13.49
WUSGSTA019	48	ND	305	ND	16.82

Notes:
Samples were intended for screening purposes and not as definitive data
F - analyte was detected between the PQL and the reporting limit
ft - feet
ND - not detected
toc - top of casing

The core of the southern section of the southern lobe of the TCE plume crosses SWMU 17, SWMU 23, and SWMU 24; the northern section of the southern lobe of the TCE plume crosses USGS phyto-remediation area and all of SWMU 62. When this plume is viewed on micro-scale at each landfill, decreasing concentrations of TCE are found in the direction of Farmers Branch Creek (Figure 5.1). In addition, increased concentrations of TCE breakdown products (e.g. *cis*-1,2-DCE [(Figure 5.2)], trans-1,2-DCE, and vinyl chloride [Figure 5.3]) are found in the direction of Farmers Branch Creek.

5.2.2 June 1999 - Southern Lobe TCE Plume Delineation

The Southern Lobe TCE Plume Delineation commenced in June 1999 and resulted in the installation of nine monitoring wells (two of the nine were installed in August 1999) to provide the additional information required to determine if the basewide TCE plume was migrating off-site.

5.2.2.1 Soil Screening

Boring logs for this project are provided in Appendix C.1 and a summary of the boring information is provided in Table 5.6. A PID was used at each sample interval and within the breathing zone to identify potentially contaminated soils or potentially dangerous working conditions in accordance with the Health and Safety Plan (HydroGeoLogic, 1999b). The results of the PID readings and soil conditions can be found on the soil boring logs included in Appendix C.1. No detections of organic vapor PID readings were recorded at levels indicative of significant soil contamination. As a result, no soil samples were collected for analysis of VOCs.

5.2.2.2 Groundwater Elevations

Groundwater elevations measured during the July 1999 quarterly sampling events from 280 monitoring wells screened in the Terrace Alluvium were used to construct the potentiometric map presented in Figure 5.4. In general, the regional groundwater flow direction is from west to east. Groundwater elevation varied from 621 feet above NGVD to 532 feet above NGVD. The head gradients toward the eastern portion of the site are considerably higher than those on the western portion. The groundwater gradient ranges from approximately 0.009 to 0.015 feet/foot. A comparison between groundwater contours for January 1999 and July 1999 indicates no significant change in groundwater elevations indicating no significant seasonal variations.

5.2.2.3 Groundwater Analytical Results

Three bi-monthly rounds of groundwater sampling were conducted on each of the nine newly installed monitoring wells. The results of the analysis of groundwater samples are presented in Table 5.7. TCE detections ranged from 0.8 to 42 μg/L; *cis*-1,2-DCE detections ranged from 0.8 to 15 μg/L; and Naphthalene detections ranged from 1 to 2 μg/L.

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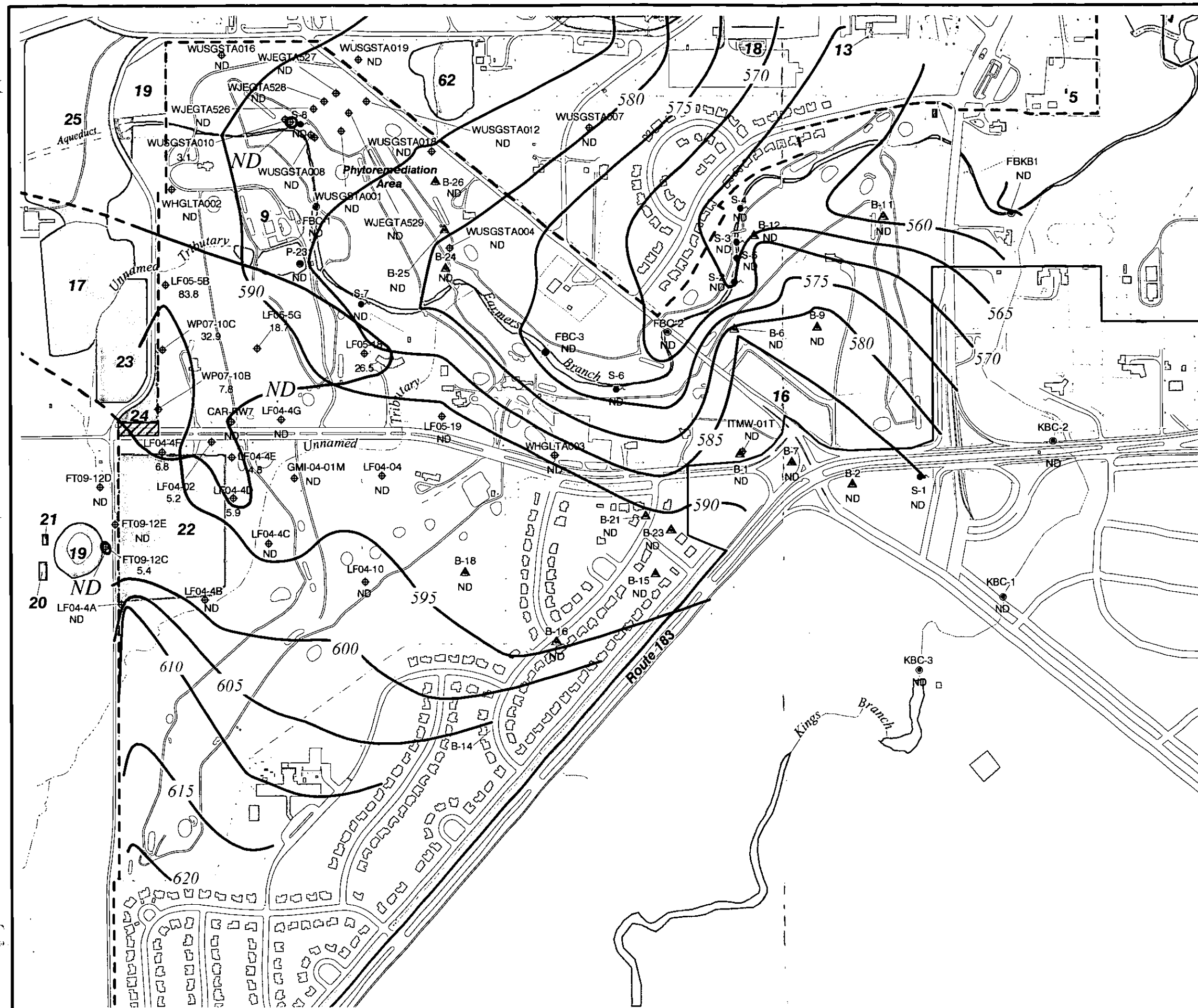

HydroGeoLogic, Inc.
Southern Lobe TCE Groundwater Plume Delineation
NAS Fort Worth JRB, Texas

Figure 5.3
1998 Vinyl Chloride Concentrations in Groundwater and Surface Water

U.S. Air Force Center for Environmental Excellence

Legend

- NAS Fort Worth JRB (Carswell Field)
- Former Carswell Air Force Base
- –580– Groundwater Elevation (Feet above MSL)
- –ND– Vinyl Chloride Concentration Contour (µg/L)
- Solid Waste Management Unit (SWMU)
- Area of Concern (AOC)
- Groundwater Treatment System
- 1998 Groundwater Sample Monitoring Well Locations
- 1998 Surface Water Sample Locations
- 1998 Spring Sample Locations
- 1998 Temporary Piezometer Locations
- 88.8 Vinyl Chloride Concentration in µg/L

Note: All data should be considered nondefinitive screening data. All groundwater samples were collected with a bailer.

F - The estimated detection between adjusted MDL and adjusted MQL.

ND - Not detected

400 0 400 800
SCALE IN FEET

N

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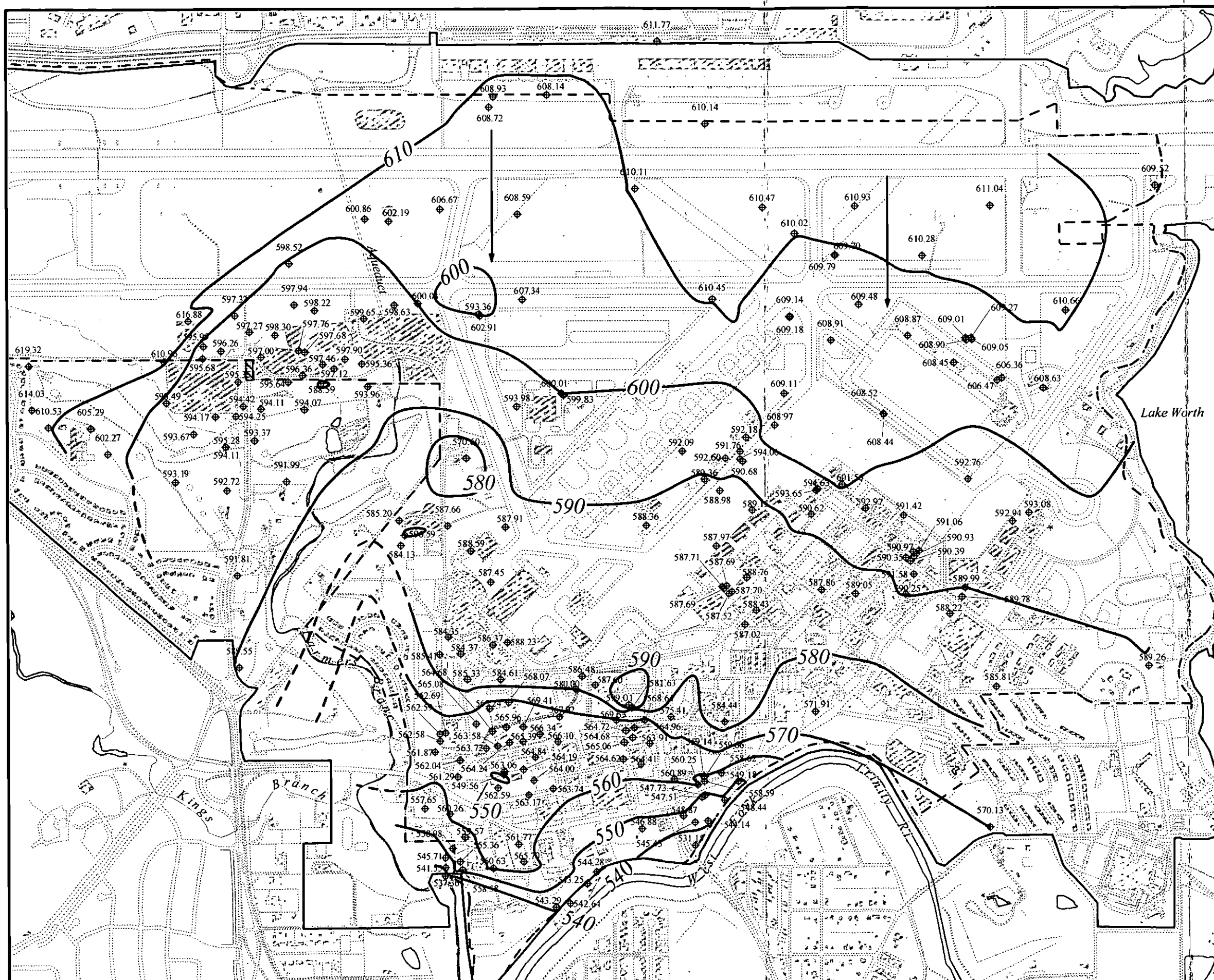

HydroGeoLogic, Inc.
Southern Lobe TCE Groundwater Plume Delineation
NAS Fort Worth JRB, Texas

Figure 5.4

Water Level Elevations
Terrace Alluvium
July 1999

U.S. Air Force Center For Environmental Excellence

Legend

- - - - NAS Fort Worth JRB (Carswell Field)

——— Former Carswell Air Force Base

-600- Groundwater Elevation Contour (Feet Above Mean Sea Level)

——→ Generalized Groundwater Flow

Monitoring Well

Groundwater Treatment System

N

0 500 1000 2000

SCALE IN FEET

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Revised: 07/25/00 jb
Map Source: HydroGeoLogic, Inc. GIS Database

HYDRO GeoLogic INC.

Table 5.6
June 1999 Southern Lobe TCE Plume Delineation
Well Construction and Boring Information Summary

Location	Date	Screen Length (ft)	Screened Interval* (ft bgs)	Depth to Water (ft)	TOC (ft)	Depth of Well (ft bgs)	Depth to Bedrock (ft)
WHGLRW015	6/22/99	10	24.0 - 14.0	17.0	-0.6	24.0	24.0
WHGLRW016	8/17/99	10	23.0 - 13.0	15.0	-0.53	23.0	23.7
WHGLRW017	8/17/99	10	24.4 - 14.4	16.0	-0.37	24.4	25.0
WHGLRW018	6/21/99	15	28.0 - 13.0	18.0	-0.2	28.0	28.0
WHGLRW019	6/18/99	15	24.0 - 9.0	15.0	-0.25	23.5	24.0
WHGLTA020	6/16/99	10	15.0 - 5.0	14.0	-0.3	15.5	16.0
WHGLTA021	6/16/99	--	--	dry	--	--	21.0
WHGLTA022	6/17/99	15	32.0 - 17.0	22.0	-0.2	32.0	32.0
WHGLTA023	6/17/99	20	29.0 - 9.0	17.0	-0.4	29.0	29.0
WHGLTA024	6/16/99	--	--	dry	--	--	10.0
WHGLTA025	6/21/99	10	20.8 - 10.8	18.0	-0.3	21.0	20.4

Notes:
bgs - below ground surface
ft - feet
TOC - top of casing
– - not applicable, well was not installed because groundwater was not encountered above bedrock

Table 5.7
1999 Southern Lobe TCE Plume Delineation Groundwater Investigation
Detections of TCE and Daughter Products above PQLs

Monitoring Well	Analyte	Result (µg/L)		
		July	September	November
WHGLRW015	Trichloroethene	42	34	24
	cis-1,2-Dichloroethene	15	12	7
WHGLTA020	Trichloroethene	0.8	NA	ND
WHGLTA025	Trichloroethene	4	6	9
	cis-1,2-Dichloroethene	0.8	2	2

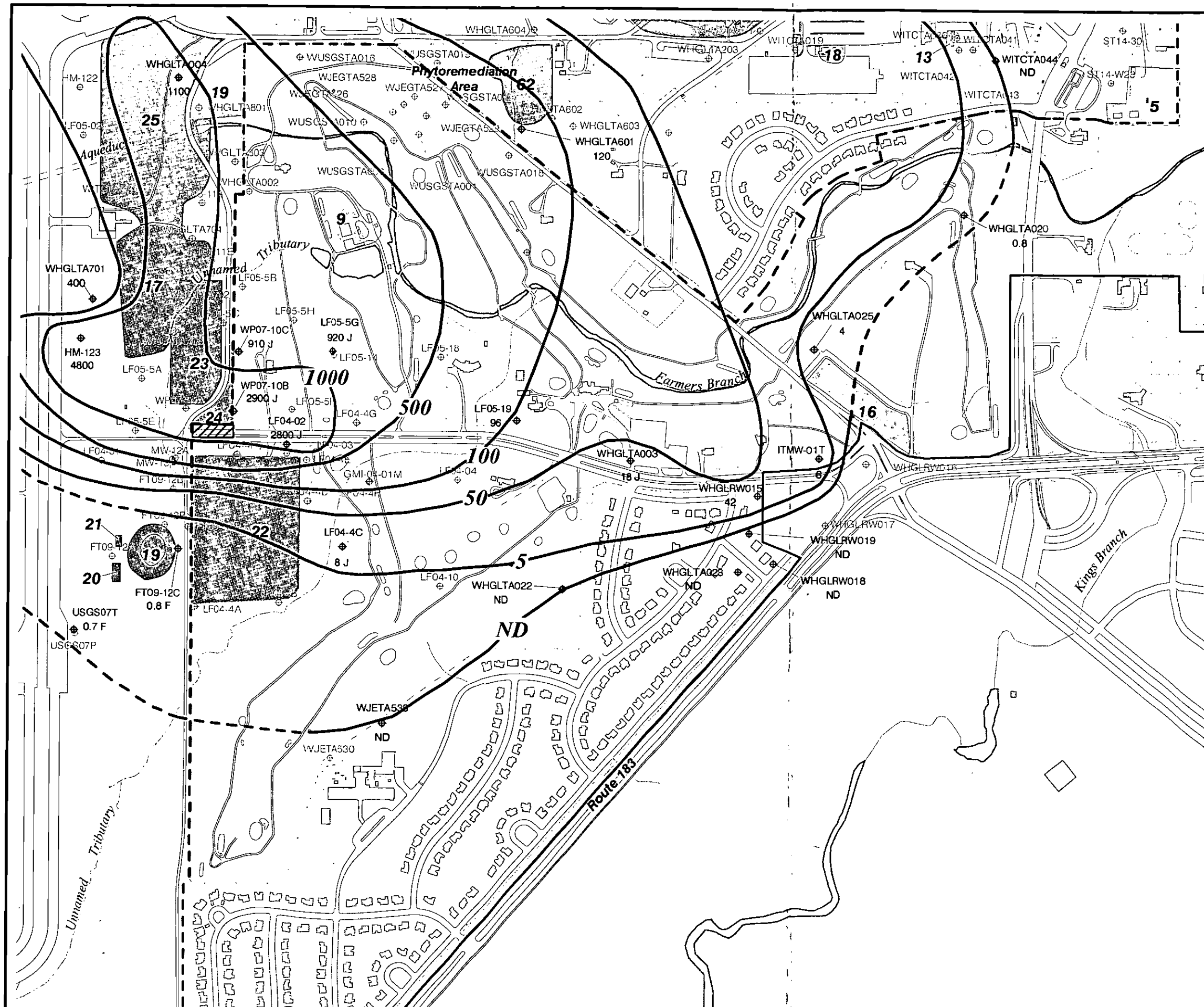
Notes:
NA - not applicable
ND - not detected

TCE concentrations were the highest at WHGLRW015. Concentrations in WHGLRW015 decreased during the three sampling rounds from 42 µg/L in July to 24 µg/L in November. Elevated concentrations of TCE were also detected at WHGLTA025, in the range of 4 to 9 µg/L over the three sampling events. Elevated concentrations of *cis*-1,2,-DCE were detected at WHGLRW015 (ranging from 7 to 15 µg/L) and WHGLTA025 (ranging from 0.8 to 2 µg/L), both under the RRS2 value of 70 µg/L.

The detections of TCE, *cis*-1,2-DCE, and vinyl chloride from the July sampling events are presented in Figures 5.5, 5.6, and 5.7, respectively. The results from the October quarterly sampling event and the November Southern Lobe TCE Plume Delineation sampling event are presented in Figure 5.8 for TCE, in Figure 5.9 for *cis*-1,2-DCE, and Figure 5.10 for vinyl chloride.

5.2.2.4 Recovery Well Sampling

The TCE and daughter product detections above MQLs from the two rounds of recovery well sampling are presented in Table 5.8 and Figure 5.11. The TCE detections ranged from 1,400 to 3,800 µg/L in September and 1,500 to 4,600 µg/L in November. The lowest detections were found in CAR-RW05, and the highest detections were found in samples collected from CAR-RW08. The *cis*-1,2-DCE detections ranged from 240 to 590 µg/L in September; the highest detection was found at samples collected from CAR-RW01. In November, the *cis*-1,2-DCE detections ranged from 330 to 860 µg/L; the highest detection was found in CAR-RW012. In both September and November, the lowest detections of *cis*-1,2-DCE were identified in CAR-RW05. The concentrations of TCE, *cis*-1,2-DCE, and vinyl chloride from both sampling events are presented in Figure 5.11. The vinyl chloride detections ranged from 4 to 36 µg/L in September; the highest detection was found in the sample collected from CAR-RW05. There were no detections of vinyl chloride from the samples collected in November. The only detection of *trans*-1,2-DCE above the MQL was in the sample collected from CAR-RW09 in September at a value of 39 µg/L.



HydroGeoLogic, Inc.
Southern Lobe TCE Groundwater Plume Delineation
NAS Fort Worth JRB, Texas

Figure 5.5
Trichloroethene Concentrations
Terrace Alluvium
July 1999

U.S. Air Force Center for Environmental Excellence

Legend

- NAS Fort Worth JRB (Carswell Field)
- Former Carswell Air Force Base
- 5 — TCE Concentration Contour (µg/L)
- Groundwater Treatment System
- Plume Monitoring Wells
- Other Monitoring Wells
- Monitoring Wells Installed in 1999 for the Southern Lobe TCE Plume Delineation
- 0.8 TCE Concentration in µg/L
- Area of Concern
  - 5 Grounds Maintenance Yard
  - 9 Golf Course Maintainence Yard
  - 13 O/W Separator
  - 16 Family Camp
  - 18 Suspected Former Fire Training Area
  - 19 Suspected Former Fire Training Area
- Solid Waste Management Unit
  - 17 Landfill No. 7
  - 19 Fire Training Area No. 2
  - 20 Waste Fuel Storage Area
  - 21 Waste Oil Tank
  - 22 Landfill No. 4
  - 23 Landfill No. 5
  - 24 Waste Burial Area
  - 25 Landfill No. 8
  - 62 Landfill No. 6

F - The estimated detection between adjusted MDL and adjusted MQL.

J - The analyte was positively identified, the quantitation is an estimation.

400 0 400 800
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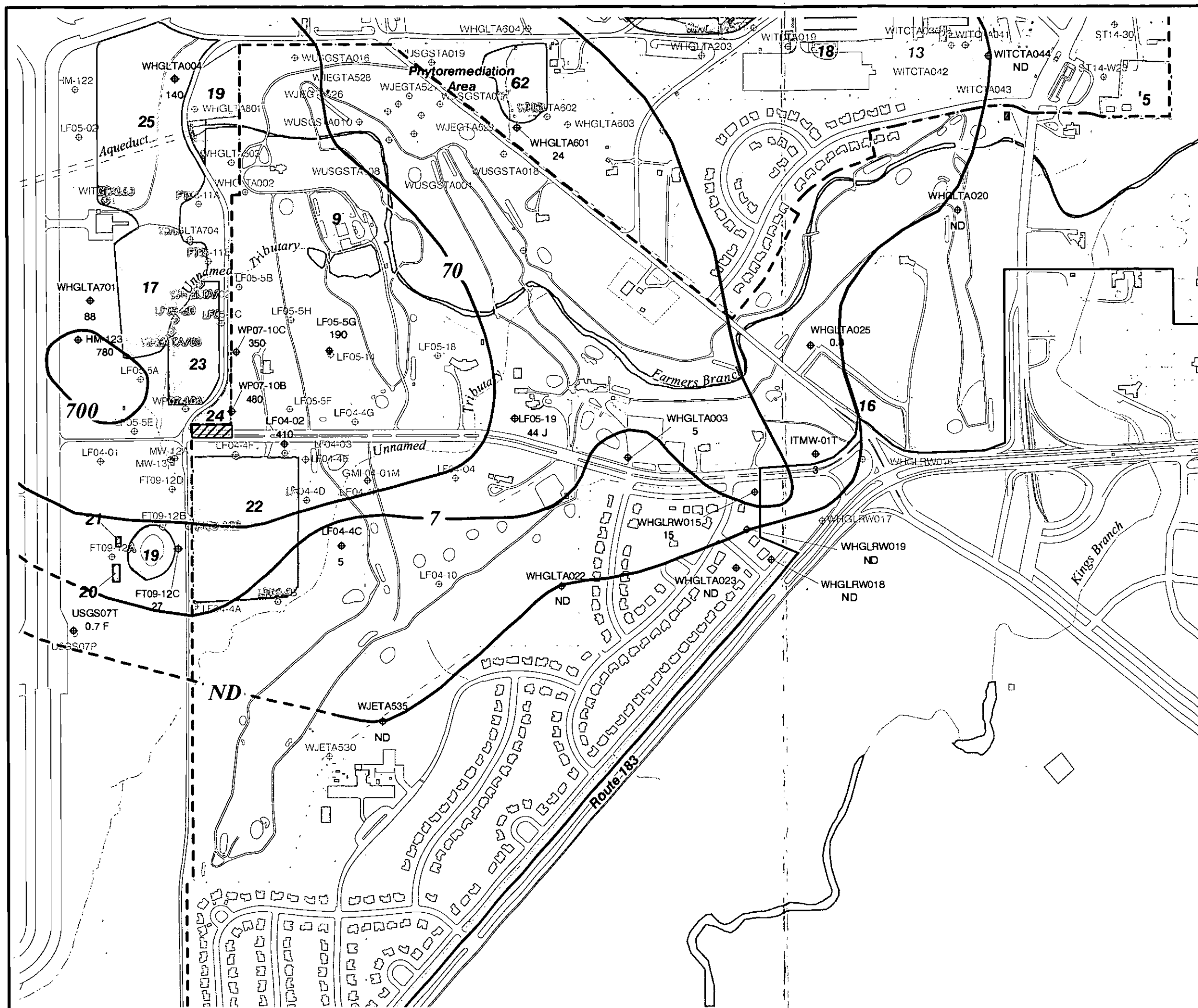

HydroGeoLogic, Inc.
Southern Lobe TCE Groundwater Plume Delineation
NAS Fort Worth JRB, Texas

Figure 5.6
cis-1,2-Dichloroethene Concentrations Terrace Alluvium July 1999

U.S. Air Force Center for Environmental Excellence

Legend

- NAS Fort Worth JRB (Carswell Field)
- Former Carswell Air Force Base
- 7 — *cis*-1,2-DCE Concentration Contour (µg/L)
- Groundwater Treatment System
- Plume Monitoring Wells
- Other Monitoring Wells
- Monitoring Wells Installed in 1999 for the Southern Lobe TCE Plume Delineation
- 190 *cis*-1,2-DCE Concentration in µg/L
- Area of Concern
  - 5 Grounds Maintenance Yard
  - 9 Golf Course Maintainence Yard
  - 13 O/W Separator
  - 16 Family Camp
  - 18 Suspected Former Fire Training Area
  - 19 Suspected Former Fire Training Area
- Solid Waste Management Unit
  - 17 Landfill No. 7
  - 19 Fire Training Area No. 2
  - 20 Waste Fuel Storage Area
  - 21 Waste Oil Tank
  - 22 Landfill No. 4
  - 23 Landfill No. 5
  - 24 Waste Burial Area
  - 25 Landfill No. 8
  - 62 Landfill No. 6

F - The estimated detection between adjusted MDL and adjusted MQL.

N

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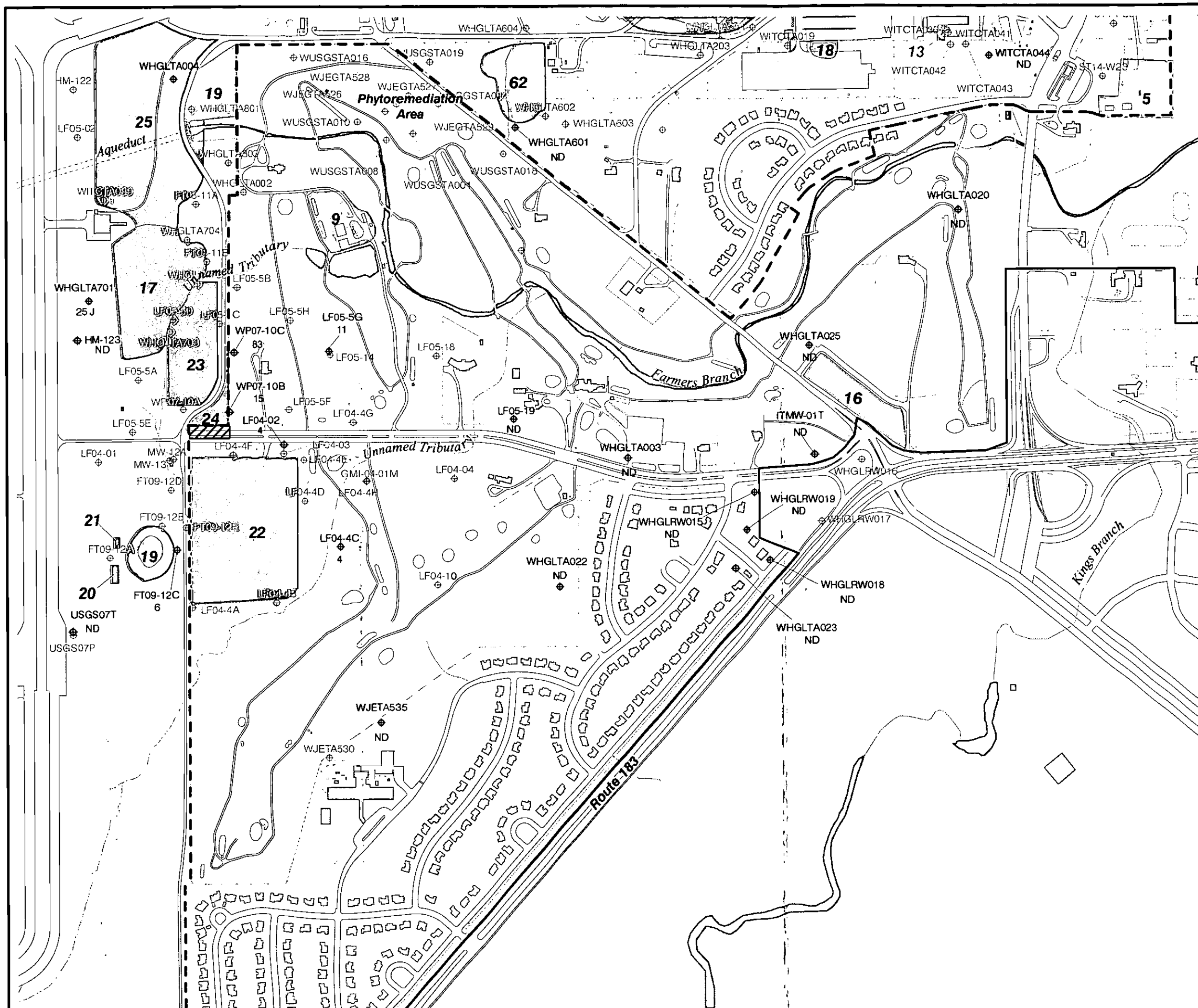

HydroGeoLogic, Inc.
Southern Lobe TCE Groundwater Plume Delineation
NAS Fort Worth JRB, Texas

Figure 5.7
Vinyl Chloride Concentrations
Terrace Alluvium
July 1999

U.S. Air Force Center for Environmental Excellence

Legend

- NAS Fort Worth JRB (Carswell Field)
- Former Carswell Air Force Base
- Groundwater Treatment System
- Plume Monitoring Wells
- Other Monitoring Wells
- Monitoring Wells Installed in 1999 for the Southern Lobe TCE Plume Delineation
- 190 Vinyl Chloride Concentration in µg/L

Area of Concern

- 5 Grounds Maintenance Yard
- 9 Golf Course Maintainence Yard
- 13 O/W Separator
- 16 Family Camp
- 18 Suspected Former Fire Training Area
- 19 Suspected Former Fire Training Area

Solid Waste Management Unit

- 17 Landfill No. 7
- 19 Fire Training Area No. 2
- 20 Waste Fuel Storage Area
- 21 Waste Oil Tank
- 22 Landfill No. 4
- 23 Landfill No. 5
- 24 Waste Burial Area
- 25 Landfill No. 8
- 62 Landfill No. 6

J - The analyte was positively identified, the quantitation is an estimation.

N

400 0 400 800
SCALE IN FEET

Filename: X:\Afc001\19cd\Final_Southern_Southern_Lobe\vinyl_chloride_july99.apr
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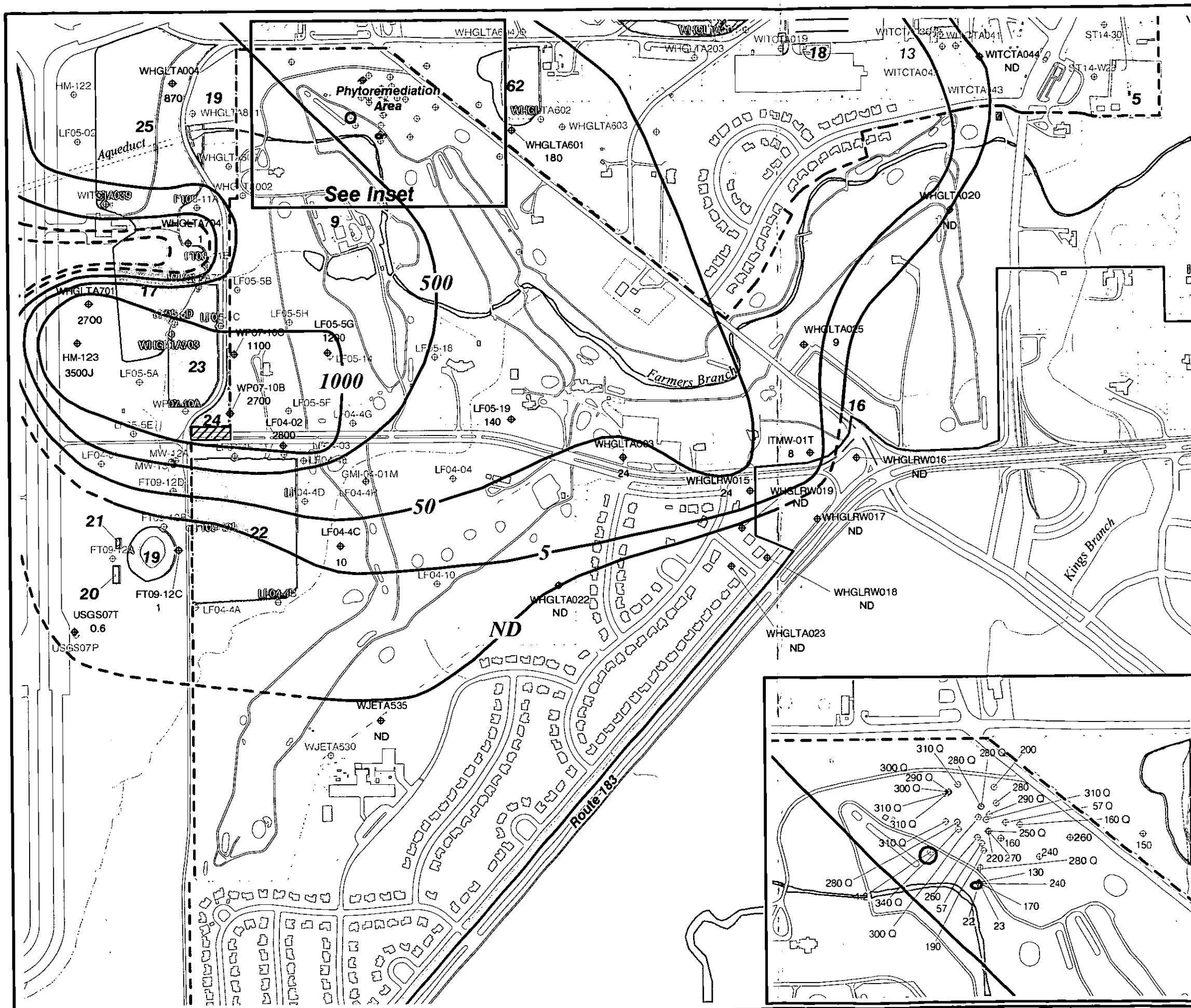
Revised: 07/26/00 jb
Map Source: HGL ArcView GIS Database

HYDRO GeoLogic INC.



HydroGeoLogic, Inc.
Southern LobeTCE Groundwater Plume Delineation
NAS Fort Worth JRB, Texas

Figure 5.8
Trichloroethene Concentrations
Terrace Alluvium
October and November 1999

U.S. Air Force Center for Environmental Excellence

Legend

- NAS Fort Worth JRB (Carswell Field)
- Former Carswell Air Force Base
- 5 TCE Concentration Contour (µg/L)
- Groundwater Treatment System
- Plume Monitoring Wells
- Other Monitoring Wells
- Monitoring Wells Installed in 1999 for the Southern Lobe TCE Plume Delineation
- 24 TCE Concentration in µg/L

Area of Concern

5 Grounds Maintenance Yard
9 Golf Course Maintainence Yard
13 O/W Separator
16 Family Camp
18 Suspected Former Fire Training Area
19 Suspected Former Fire Training Area

Solid Waste Management Unit

17 Landfill No. 7
19 Fire Training Area No. 2
20 Waste Fuel Storage Area
21 Waste Oil Tank
22 Landfill No. 4
23 Landfill No. 5
24 Waste Burial Area
25 Landfill No. 8
62 Landfill No. 6

J - The analyte was positively identified, the quantitation is an estimation.

400 0 400 800
SCALE IN FEET

N

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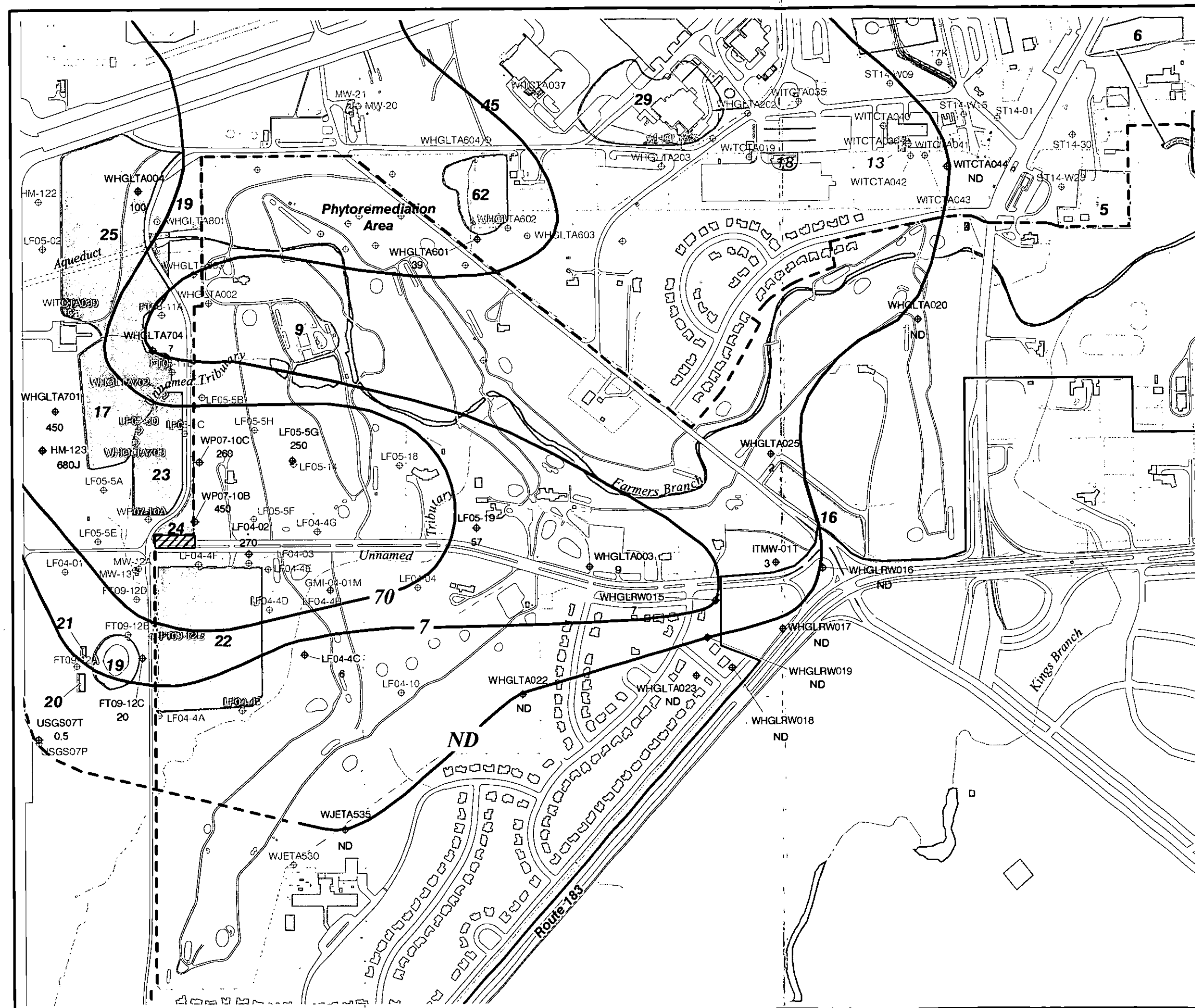

HydroGeoLogic, Inc.
Southern Lobe TCE Groundwater Plume Delineation
NAS Fort Worth JRB, Texas

Figure 5.9
cis-1,2-Dichloroethene Concentrations Terrace Alluvium October and November 1999

U.S. Air Force Center for Environmental Excellence

Legend

- NAS Fort Worth JRB (Carswell Field)
- Former Carswell Air Force Base
- 7 — *cis*-1,2-DCE Concentration Contour (µg/L)
- Plume Monitoring Wells
- Other Monitoring Wells
- Monitoring Wells Installed in 1999 for the Southern Lobe TCE Plume Delineation
- 0.5 *cis*-1,2-DCE Concentrations in µg/L
- Groundwater Treatment System
- Area of Concern
  - 5 Grounds Maintenance Yard
  - 9 Golf Course Maintainence Yard
  - 13 O/W Separator
  - 16 Family Camp
  - 18 Suspected Former Fire Training Area
  - 19 Suspected Former Fire Training Area
- Solid Waste Management Unit
  - 17 Landfill No. 7
  - 19 Fire Training Area No. 2
  - 20 Waste Fuel Storage Area
  - 21 Waste Oil Tank
  - 22 Landfill No. 4
  - 23 Landfill No. 5
  - 24 Waste Burial Area
  - 25 Landfill No. 8
  - 62 Landfill No. 6

J - The analyte was positively identified, the quantitation is an estimation.

400 0 400 800
SCALE IN FEET

N

Filename: X:\Afc001\19cd\Final Summary Southern_Lobe\dce_oct&nov99.apr
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Created: 01/11/00 jbelcher
Revised: 07/26/00 jb
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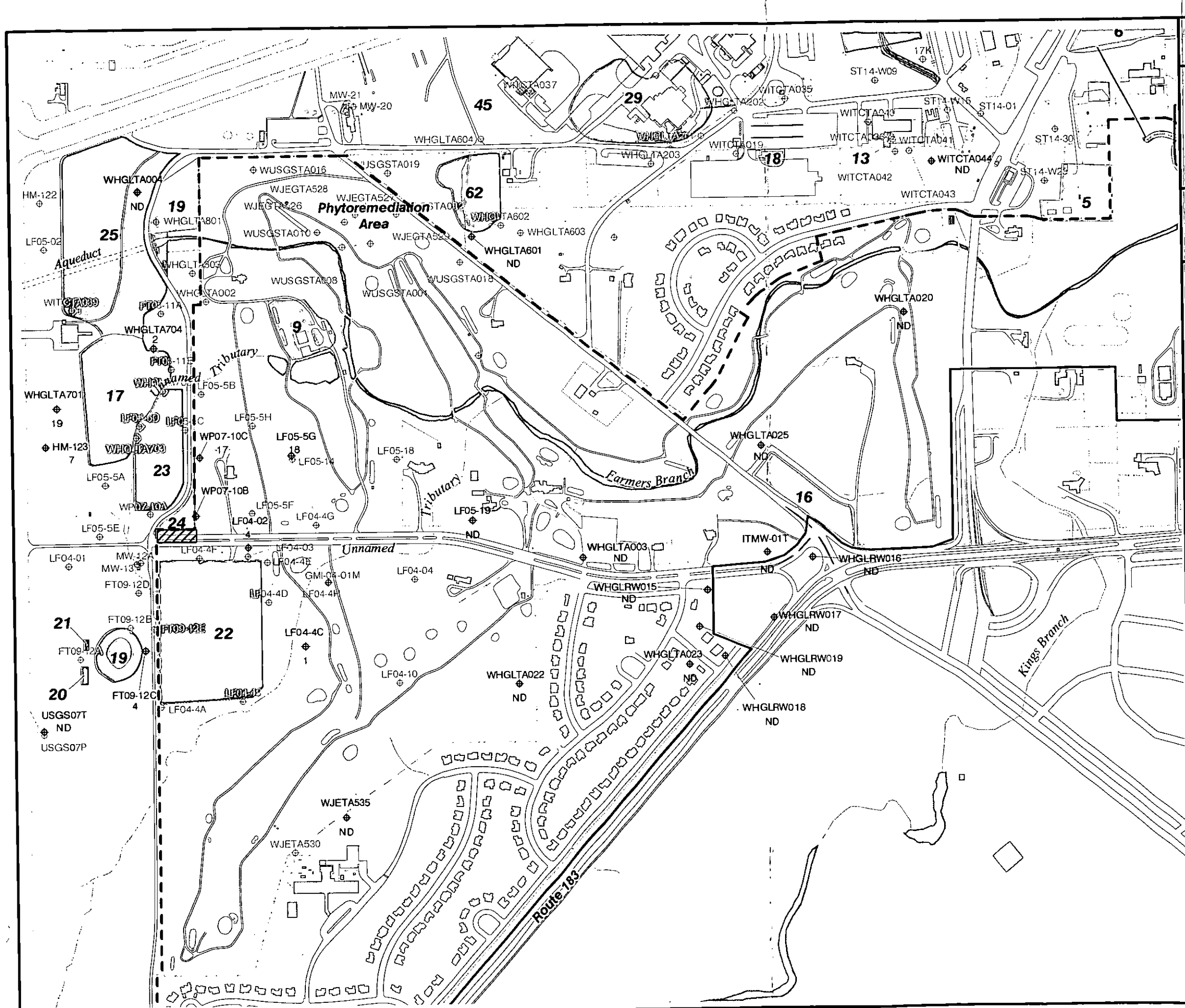
HYDRO GeoLogic INC.



HydroGeoLogic, Inc.
Southern Lobe TCE Groundwater Plume Delineation
NAS Fort Worth JRB, Texas

Figure 5.10
Vinyl Chloride Concentrations Terrace Alluvium October and November 1999

U.S. Air Force Center for Environmental Excellence

Legend

- NAS Fort Worth JRB (Carswell Field)
- Former Carswell Air Force Base
- Plume Monitoring Wells
- Other Monitoring Wells
- Monitoring Wells Installed in 1999 for the Southern Lobe TCE Plume Delineation
- 0.5 Vinyl Chloride Concentrations in µg/L
- Groundwater Treatment System

Area of Concern

5 Grounds Maintenance Yard
9 Golf Course Maintainence Yard
13 O/W Separator
16 Family Camp
18 Suspected Former Fire Training Area
19 Suspected Former Fire Training Area

Solid Waste Management Unit

17 Landfill No. 7
19 Fire Training Area No. 2
20 Waste Fuel Storage Area
21 Waste Oil Tank
22 Landfill No. 4
23 Landfill No. 5
24 Waste Burial Area
25 Landfill No. 8
62 Landfill No. 6

N

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SCALE IN FEET

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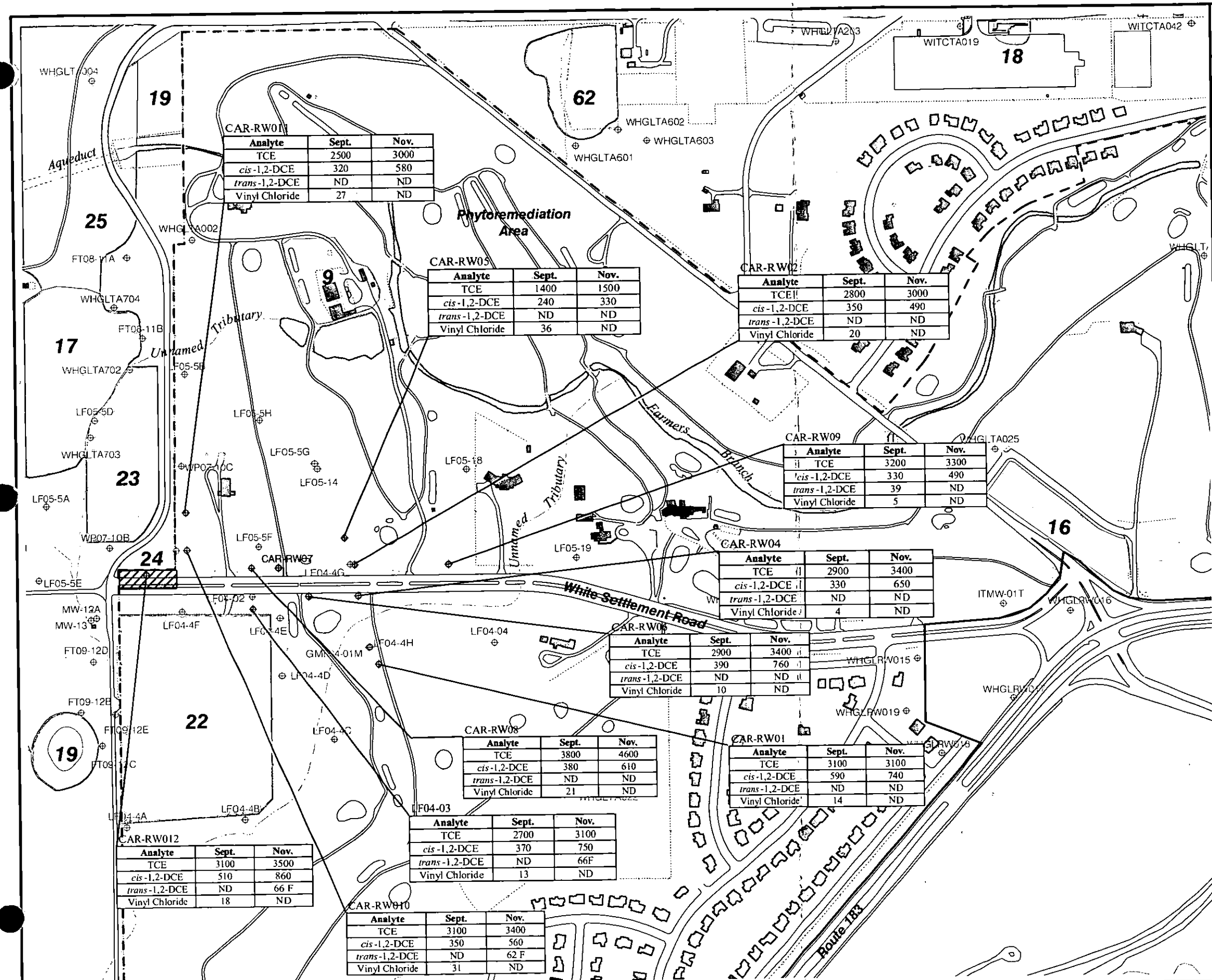
HYDRO GeoLogic INC.



CAR-RW01

Analyte	Sept.	Nov.
TCE	2500	3000
cis-1,2-DCE	320	580
trans-1,2-DCE	ND	ND
Vinyl Chloride	27	ND

CAR-RW05

Analyte	Sept.	Nov.
TCE	1400	1500
cis-1,2-DCE	240	330
trans-1,2-DCE	ND	ND
Vinyl Chloride	36	ND

CAR-RW02

Analyte	Sept.	Nov.
TCE	2800	3000
cis-1,2-DCE	350	490
trans-1,2-DCE	ND	ND
Vinyl Chloride	20	ND

CAR-RW09

Analyte	Sept.	Nov.
TCE	3200	3300
cis-1,2-DCE	330	490
trans-1,2-DCE	39	ND
Vinyl Chloride	5	ND

CAR-RW04

Analyte	Sept.	Nov.
TCE	2900	3400
cis-1,2-DCE	330	650
trans-1,2-DCE	ND	ND
Vinyl Chloride	4	ND

CAR-RW06

Analyte	Sept.	Nov.
TCE	2900	3400
cis-1,2-DCE	390	760
trans-1,2-DCE	ND	ND
Vinyl Chloride	10	ND

CAR-RW08

Analyte	Sept.	Nov.
TCE	3800	4600
cis-1,2-DCE	380	610
trans-1,2-DCE	ND	ND
Vinyl Chloride	21	ND

CAR-RW01

Analyte	Sept.	Nov.
TCE	3100	3100
cis-1,2-DCE	590	740
trans-1,2-DCE	ND	ND
Vinyl Chloride	14	ND

LF04-03

Analyte	Sept.	Nov.
TCE	2700	3100
cis-1,2-DCE	370	750
trans-1,2-DCE	ND	66F
Vinyl Chloride	13	ND

CAR-RW012

Analyte	Sept.	Nov.
TCE	3100	3500
cis-1,2-DCE	510	860
trans-1,2-DCE	ND	66 F
Vinyl Chloride	18	ND

CAR-RW010

Analyte	Sept.	Nov.
TCE	3100	3400
cis-1,2-DCE	350	560
trans-1,2-DCE	ND	62 F
Vinyl Chloride	31	ND

HydroGeoLogic, Inc.
Southern Lobe TCE Groundwater Plume Delineation
NAS Fort Worth JRB, Texas

Figure 5.11
Active Recovery Wells
Trichloroethene and
***cis*-1,2-Dichloroethene Concentrations**
September and November 1999

U.S. Air Force Center for Environmental Excellence

Legend

- NAS Fort Worth JRB Boundary (Carswell Field)
- Former Carswell Air Force Base Boundary
- Recovery Wells
- Monitoring Wells
- Groundwater Treatment System
- Solid Waste Management Unit
  - SWMU 17 Landfill No. 7
  - SWMU 19 Fire Training Area No. 2
  - SWMU 22 Landfill No. 4
  - SWMU 23 Landfill No. 5
  - SWMU 24 Waste Burial Area No. 7
  - SWMU 25 Landfill No. 8
  - SWMU 62 Landfill No. 6
- Area of Concern
  - AOC 9 Golf Course Maintenance Yard
  - AOC 16 Family Camp
  - AOC 18 Suspected Fire Training Area 4
  - AOC 19 Suspected Fire Training Area 8

Note: All concentrations in µg/L
All data are unvalidated

N

400 0 400
SCALE IN FEET

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Project: AFC001-19CD
Created: 02/03/00 jbelcher
Revised: 07/26/00 jb
Map Source: HGL GIS database

HYDRO GeoLogic INC.

Table 5.8
1999 Recovery Well TCE and Daughter Products above Method Quantitation Limits

Monitoring Well	Analyte	Result (µg/L)	
		September	November
CAR-RW01	cis-1,2-Dichloroethene	590	740
	Trichloroethene (TCE)	3100	3100
	Vinyl Chloride	14	ND
CAR-RW02	1,4-DiChlorobenzene	1	ND
	cis-1,2-Dichloroethene	350	490
	Tetrachloroethene (PCE)	3	ND
	Trichloroethene (TCE)	2800	3000
	Vinyl Chloride	20	ND
CAR-RW04	cis-1,2-Dichloroethene	330	650
	Tetrachloroethene (PCE)	7	ND
	Trichloroethene (TCE)	2900	3400
	Vinyl Chloride	4	ND
CAR-RW05	1,3-DiChlorobenzene	2	ND
	cis-1,2-Dichloroethene	240	330
	Trichloroethene (TCE)	1400	1500
	Vinyl Chloride	36	ND
CAR-RW06	cis-1,2-Dichloroethene	390	760
	Tetrachloroethene (PCE)	4	ND
	Trichloroethene (TCE)	2900	3400
	Vinyl Chloride	10	ND
CAR-RW08	cis-1,2-Dichloroethene	380	610
	Tetrachloroethene (PCE)	14	ND
	Trichloroethene (TCE)	3800	4600
	Vinyl Chloride	21	ND
CAR-RW09	cis-1,2-Dichloroethene	330	490
	Tetrachloroethene (PCE)	6	ND
	trans-1,2-Dichloroethene	39	ND
	Trichloroethene (TCE)	3200	3300
	Vinyl Chloride	5	ND
CAR-RW010	cis-1,2-Dichloroethene	350	560*
	Trichloroethene (TCE)	3100	3400*
	Vinyl Chloride	31	ND
CAR-RW011	cis-1,2-Dichloroethene	320	580
	Tetrachloroethene (PCE)	13	ND
	Trichloroethene (TCE)	2500	3000
	Vinyl Chloride	27	ND
CAR-RW012	cis-1,2-Dichloroethene	510	860
	Trichloroethene (TCE)	3100	3500
	Vinyl Chloride	18	ND

Table 5.8 (continued)
1999 Recovery Well TCE and Daughter Products above Method Quantitation Limits

Monitoring Well	Analyte	Result (µg/L)	
		September	November
LF04-03	cis-1,2-Dichloroethene	370	750
	Tetrachloroethene (PCE)	2	ND
	Trichloroethene (TCE)	2700	3100
	Vinyl Chloride	13	ND

Notes:
*The higher duplicate results were used in place of the original environmental sample
F - analyte was detected between the PQL and the reporting limit
ND - not detected

5.2.2.5 1999 Quarterly Groundwater Sampling

As a part of the quarterly groundwater sampling at NAS Fort Worth JRB, several wells in the area of the southern lobe TCE plume are monitored on a quarterly basis. To provide additional background information, the analytical results from the four most recent sampling events (January, April, July, and October 1999) from these wells are presented in Table 5.9. The highest concentrations of TCE on NAS Fort Worth JRB property are generally detected upgradient of the groundwater treatment system and SWMU 24 at monitoring wells HM-123 and WHGLTA701. These higher concentrations are likely caused by TCE migration along the paleochannel. TCE concentrations ranged from 3,300 J to 4,800 μg/L at samples collected from HM-123 and 400 to 2,700 μg/L at WHGLTA701. Other significant TCE concentrations were detected in the area located near the groundwater treatment system in samples collected from the following wells: WP07-10C, WP07-10B, LF05-5G, and LF04-02, where the concentrations range from 560 J to 3,100 J μg/L.

5.2.2.5.1 Natural Attenuation Monitoring

TCE can be present in a groundwater environment either as an original component of a release or as a reductive dechlorination product of PCE. At NAS Fort Worth JRB, the TCE appears to be an original component rather than a dechlorination product, although some PCE has been detected at the sites. TCE undergoes sequential reductive dechlorination initially forming the DCE isomers (mainly *cis*-1,2-DCE), then vinyl chloride, and finally ethene and ethane. The completeness of the sequential dechlorination of TCE to less chlorinated compounds is dependent on the redox conditions in the aquifer (Environmental Science Center, 1997).

Since 1995, natural attenuation parameters have been collected at the site on a regular basis (semi-annually prior to July 1997, and quarterly since July 1997). These parameters include common anions (EPA Method SW9060), methane, ethane, ethene (Method RSK-175) total organic carbon (TOC) (EPA Method E415.1), and alkalinity (EPA Method 310.1), as well as several of the standard field parameters collected at every well. During that same time period, CH2MHILL also conducted an RFI at AOC 2 (CH2MHILL, 1999). Data evaluations from both the AOC 2 RFI report and from the quarterly natural attenuation data have virtually the same conclusions: while some reductive dechlorination has occurred with the TCE plume at NAS Fort Worth JRB, as evidenced by the large extent of *cis*-1,2-DCE, it is limited in extent. The percentage of *cis*-1,2-DCE compared to *trans*-1,2-DCE is approximately 70 percent based on DCE data collected in 1999. This ratio is a strong indicator that the DCE is present from the dechlorination rather than from a direct source.

The following data supports the lack of evidence for complete TCE degradation. Data to support these findings can be found in the 1999 Annual Report (HGL, 2000a):

Table 5.9
1999 Quarterly Groundwater Investigations Detections of TCE and Daughter Products above Method Quantitation Limits in Monitoring Wells Located in the Area of the Southern Lobe TCE Plume

Monitoring Well	Analyte	Result (µg/L)			
		January	April	July	October
FT09-12C	cis-1,2-Dichloroethene	33	26	27	20
	trans-1,2-Dichloroethene	ND	ND	ND	0.6
	Trichloroethene	1	1 J	0.8 F	1
	Vinyl Chloride	4	3	6	4
HM-123	1,1-Dichloroethene	4	3	ND	4 J
	cis-1,2-Dichloroethene	740	680 J	780	680 J
	Tetrachloroethene	0.7	0.7 J	ND	0.8
	trans-1,2-Dichloroethene	24	18	16 F	22
	Trichloroethene	3500	3300 J	4800	3500 J
	Vinyl Chloride	ND	6	ND	7
LF04-02	1,1-Dichloroethene	2	2	2	2
	cis-1,2-Dichloroethene	510	300 J	410	270
	Tetrachloroethene	9	11 J	6	9
	trans-1,2-Dichloroethene	22	24	24	23
	Trichloroethene	3300	2400 J	2800 J	2800
	Vinyl Chloride	3	2	4	4
LF04-4C	cis-1,2-Dichloroethene	7	6	5	6
	trans-1,2-Dichloroethene	2	2	1	1
	Trichloroethene	10	7 J	8 J	10
	Vinyl Chloride	3	2	4	1
LF05-19	cis-1,2-Dichloroethene	13	34	44 J	57
	trans-1,2-Dichloroethene	ND	0.7	1	1
	Trichloroethene	27	68 J	96	140
LF05-5G	1,1-Dichloroethene	3	3	4	3
	cis-1,2-Dichloroethene	290	140	190	250
	trans-1,2-Dichloroethene	20	12	20	32
	Trichloroethene	1000	560 J	920 J	1200
	Vinyl Chloride	8	6	11	18
ITMW-01T	cis-1,2-Dichloroethene	5	NA	3	3
	trans-1,2-Dichloroethene	0.7	NA	ND	ND
	Trichloroethene	12	NA	6	8
USGS07T	cis-1,2-Dichloroethene	0.8	NA	0.7 F	0.5
	Tetrachloroethene	1	NA	1 J	1
	Trichloroethene	0.7	NA	0.7 F	0.6
WHGLTA003	cis-1,2-Dichloroethene	8	7	5	
	Trichloroethene	28	27	18 J	24
WHGLTA004	1,1-Dichloroethene	2	2	2	2
	cis-1,2-Dichloroethene	180	120	140	100
	trans-1,2-Dichloroethene	6	5	5	7
	Trichloroethene	1300	1300 J	1100	870

Table 5.9 (continued)
1999 Quarterly Groundwater Investigations Detections of TCE and Daughter Products above Method Quantitation Limits in Monitoring Wells Located in the Area of the Southern Lobe TCE Plume

Monitoring Well	Analyte	Result (µg/L)			
		January	April	July	October
WHGLTA601	cis-1,2-Dichloroethene	21	27 J	24	39
	trans-1,2-Dichloroethene	2	2	2	4
	Trichloroethene	110	150 J	120	180
WHGLTA701	1,1-Dichloroethene	NA	NA	5	3
	cis-1,2-Dichloroethene	NA	NA	88	450
	Tetrachloroethene	NA	NA	ND	0.6
	trans-1,2-Dichloroethene	NA	NA	70 J	56 J
	Trichloroethene	NA	NA	400	2700
	Vinyl Chloride	NA	NA	25 J	19
WHGLTA704	cis-1,2-Dichloroethene	NA	NA	NA	7
	trans-1,2-Dichloroethene	NA	NA	NA	2
	Trichloroethene	NA	NA	NA	1
	Vinyl Chloride	NA	NA	NA	2
WP07-10B	cis-1,2-Dichloroethene	500	430 J	480	450
	Tetrachloroethene	15	8 J	3	5
	trans-1,2-Dichloroethene	39	34	38	50
	Trichloroethene	3100	3100 J	2900 J	2700
	Vinyl Chloride	9	ND	15	14
WP07-10C	cis-1,2-Dichloroethene	300	320 J	350	250
	trans-1,2-Dichloroethene	26	35	65	
	Trichloroethene	1300	1500 J	910 J	1100
	Vinyl Chloride	25	24	83	17

Notes:
F - analyte was detected between the PQL and the reporting limit
J - analyte was positively identified, the quantitation is an estimation
NA - not analyzed
ND - not detected

- Sampling data indicate virtually no presence of ethene or ethane, the ultimate products of TCE degradation (assuming complete reductive dechlorination). Only 10 quarterly wells out of 62 sampled over the past 3 years have displayed any concentration of ethene. The highest concentrations of ethene and ethane were 7 μg/L and 74 μg/L, respectively.

- Some nitrate and high sulfate concentrations exist at the site. These preferred electron acceptors compete with the TCE. The areas of high sulfate and nitrate concentrations occur in the areas of highest TCE contamination in the southern TCE plume near the landfill area, most likely inhibiting the degradation of the TCE.

- TOC concentrations are extremely low at the site, averaging less than 4 mg/L over the 62 quarterly wells sampled. The wells with the lowest TOC concentrations correlate with the areas of highest TCE concentration, indicating that the carbon source has been virtually depleted. TOC concentrations of 20 mg/L or more are considered a significant level of organic carbon source (CH2MHILL, 1999). Carbon acts as an electron donor and is considered one of the more important factors in order for degradation to occur.

- Sampling data from 1998 and 1999 indicate only 14 of 54 quarterly monitoring wells have shown any concentrations of vinyl chloride, the first degradation product of DCE (Table F.6). Concentrations of vinyl chloride ranged from non-detect in many wells to 490 μg/L in LF05-01.

- DCE concentrations are substantially lower than TCE concentrations, showing that TCE is still the dominant contaminant, resisting degradation.

In addition to the evidence above, the AFCEE and EPA protocol (AFCEE, 1996) for "scoring" the potential for natural attenuation of chlorinated solvents was applied to the 1999 quarterly data at the site in the 1999 Annual Report (HGL, 2000a). According to the guidelines the following conclusions can be made for the scores below:

- 0 to 5 = Inadequate evidence for biodegradation of chlorinated organics

- 6 to 14 = Limited evidence for biodegradation of chlorinated organics

- 15 to 20 = Adequate evidence for biodegradation of chlorinated organics

- >20 = Strong evidence for biodegradation of chlorinated organics

The sampling data for January 1999, April 1999, July, and October 1999 were evaluated using the scoring protocol. All wells sampled for natural attenuation parameters and VOCs (on average 27 wells) were included in this evaluation. Only two wells, LF05-01 and FT09-12C, demonstrated a score greater than 20, which is a score that indicates strong evidence for biodegradation of chlorinated organics. Six wells scored between 15 to 20 at least once during the four quarters. This score indicates adequate evidence for biodegradation of chlorinated organics. Twenty-two wells scored between 6 to 14 at least once during the four quarters.

Twenty-one wells scored 0 to 5 at least once during the four quarters. These scoring ranges indicate inadequate evidence to support the biodegradation of chlorinated organics.

5.3 LITHOLOGICAL FINDINGS

Nine monitoring/extraction wells were installed in the southern groundwater plume area to determine the depth to bedrock, the lithologic unit which represents bedrock, the depth to groundwater, and the direction of the groundwater flow. The results from these lithological investigations were utilized along with existing lithological information to create geologic cross sections of the south and southeastern area of the base. The cross section location map is presented as Figure 5.12. Each of the cross sections are discussed individually below. The lithology of the cross sections are discussed, and then the lithology's effect on the contamination is interpreted. Bedrock elevation data from borings and wells located throughout NAS Fort Worth JRB have been incorporated into a bedrock elevation contour map (Figure 5.13).

5.3.1 Cross-Section B-B'

Cross section B-B' (Figure 5.14) depicts the stratigraphy of the Alluvial Terrace deposit and elevation of bedrock along the axis of the southern section of the southern lobe of the regional TCE plume. The stratigraphic sequence for this cross-section indicates a pattern of fine-grained soils grading to coarser grained soils with depth. Clay is found at the surface overlying a discontinuous layer of silt. A continuous layer of well sorted fine to medium sand is found below the silt layer. The base of the Alluvial Terrace deposit is composed of gravelly sand overlying a poorly sorted sandy gravel which is referred to as basal gravel. Bedrock elevations generally decrease in an easterly direction. Note that a hatch pattern is present at monitoring well locations where bedrock was not clearly encountered.

As discussed previously, the southern lobe is migrating southeast along a former paleochannel of the West Fork Trinity River (Parsons, 1998). It crosses the flightline and landfill areas of NAS Fort Worth JRB before turning east along White Settlement Road. Cross-section B-B' intersects the southeasterly trending paleochannel at monitoring well HM-123 near the point where the paleochannel is diverted east along White Settlement Road. Historically TCE has not been detected in groundwater at HM-127. In contrast, monitoring wells HM-123, LF05-5A, WP07-10A, and LF05-5F have all exhibited TCE concentrations greater than 1 mg/L. TCE concentrations decrease in an easterly direction. Note that an unnamed intermittent tributary of Farmers Branch Creek is located just west of LF05-19. A significant portion of the TCE plume is migrating towards Farmers Branch Creek along this valley.

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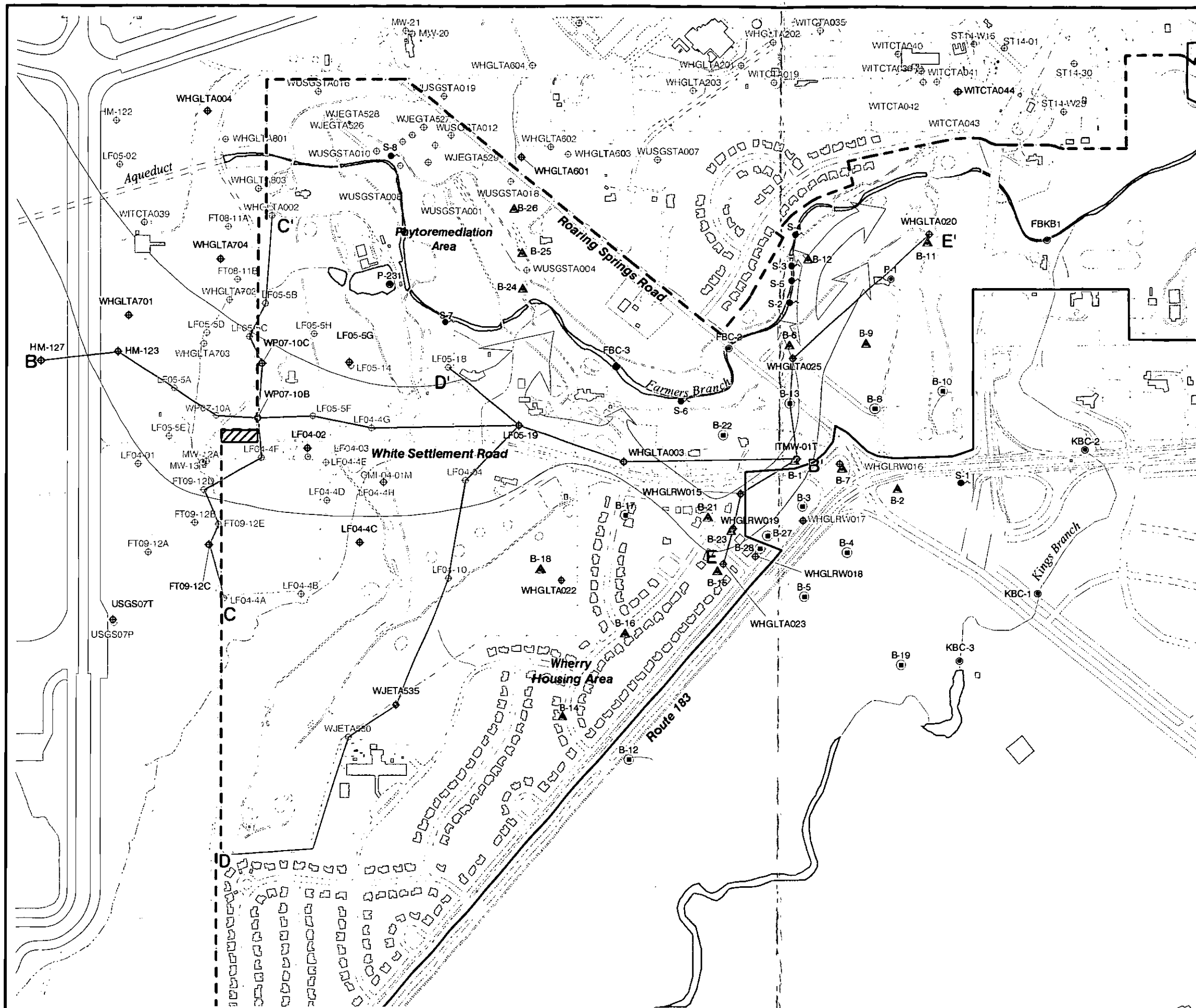

HydroGeoLogic, Inc.
Southern Lobe TCE Groundwater Plume Delineation
NAS Fort Worth JRB, Texas

Figure 5.12
Regional Cross Section Location
B-B', C-C', D-D', E-E'

U.S. Air Force Center for Environmental Excellence

Legend

- NAS Fort Worth JRB Boundary (Carswell Field)
- Former Carswell Air Force Base Boundary
- Plume Monitoring Wells
- Other Monitoring Wells
- Monitoring Wells Installed in 1999 For The Southern Lobe TCE Plume Delineation
- 1998 Boring Locations
- 1998 Boring/Temporary Piezometer Locations
- 1998 Spring Sample Locations
- 1998 Boring Locations
- B——B' Cross Section Location
- Preferential Flow Pathway (Paleochannel and Bedrock Low)
- Groundwater Treatment System

N

400 0 400 800

SCALE IN FEET

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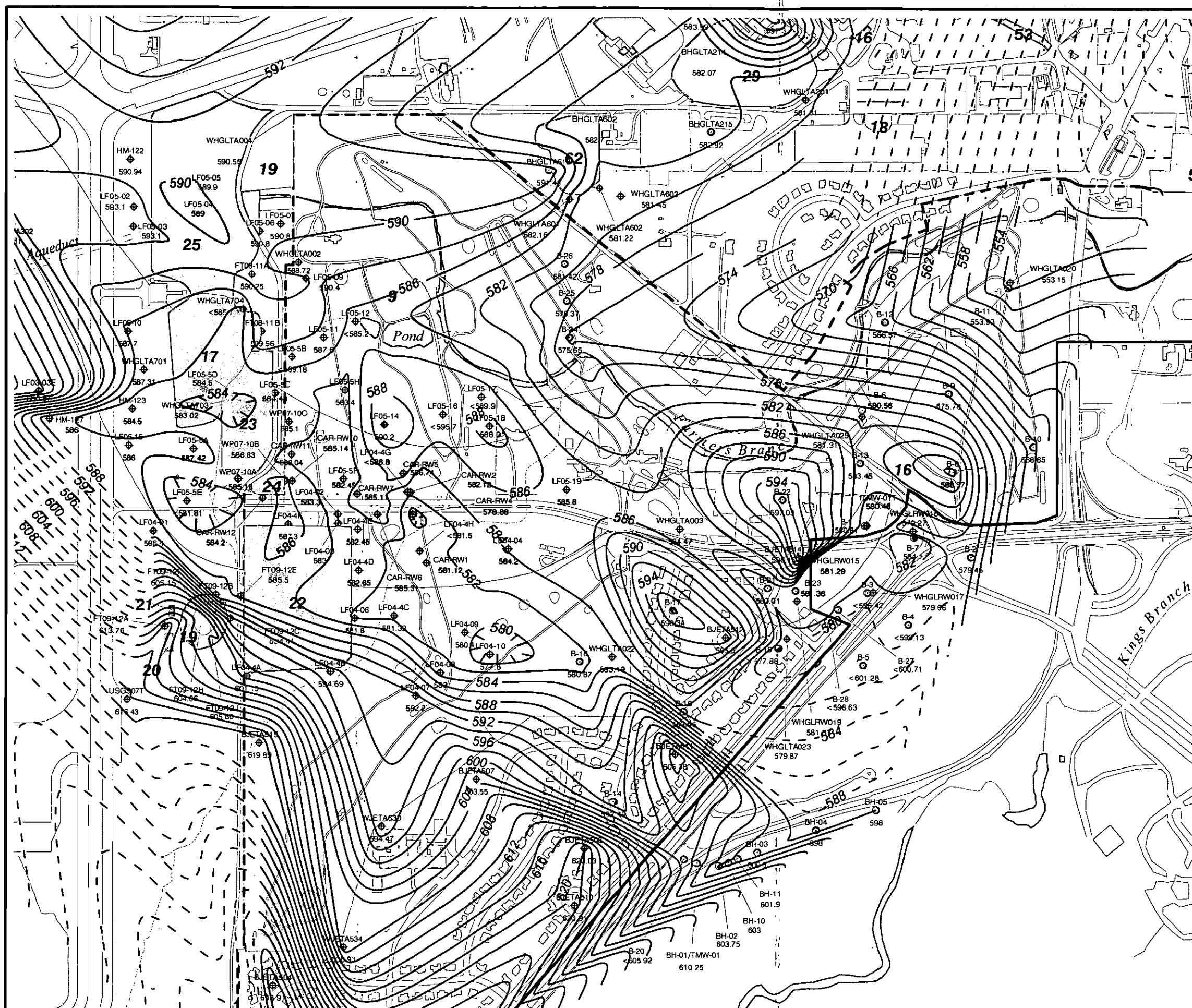
Created: 01/11/00 jbelcher
Revised: 07/26/00 jb
Map Source: HGL ArcView GIS Database

HYDRO GeoLogic INC.



HydroGeoLogic, Inc.
Southern Lobe TCE Groundwater Plume Delineation
NAS Fort Worth JRB, Texas

Figure 5.13

Bedrock Elevations and Preferential Flow Pathways

U.S. Air Force Center For Environmental Excellence

Legend

- - - - NAS Fort Worth JRB (Carswell Field)

——— Former Carswell Air Force Base

—586— Bedrock Elevation (ft msl)

LF04-01 Monitoring Well Id

586.50 Bedrock Elevation (ft msl)

FT09-12J Soil Boring Id

586.50 Bedrock Elevation (ft msl)

Preferential Flow Pathway (Paleochannel and Bedrock Low)

Solid Waste Management Unit (SWMU)

Area of Concern (AOC)

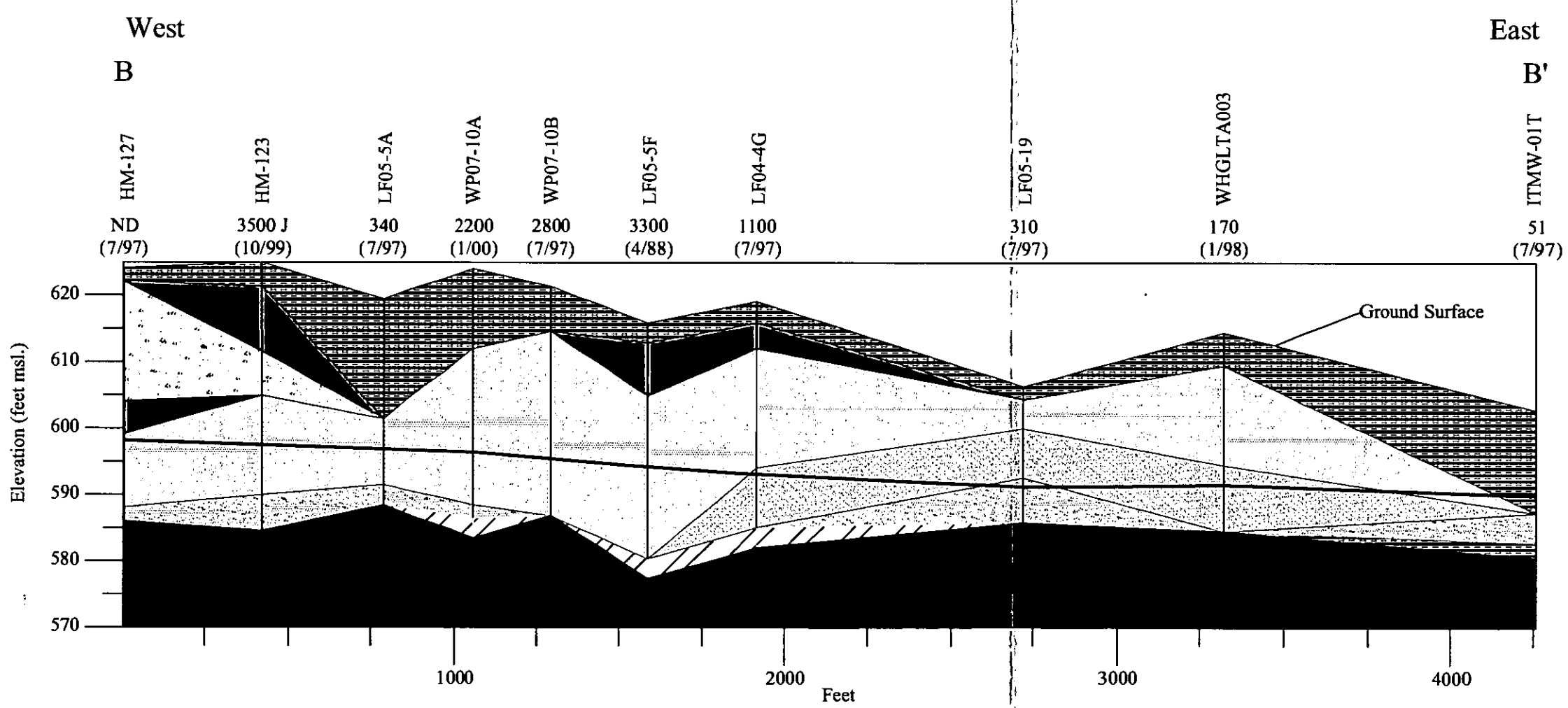
Note: < indicates bedrock was not encountered, the elevation is the end of the boring

N

300 0 300 600
SCALE IN FEET

Filename: X:\Afc001\19cd\Final_Summary_ Southern_Lobe\ bedrock&gravel.apr
Project: AFC001-19CD
Created: 03/22/00 jbelcher
Revised: 07/26/00 jb
Map Source: HydroGeoLogic GIS Database

HYDRO GeoLogic INC.



HydroGeoLogic, Inc.
Southern Lobe TCE Groundwater Plume Delineation
NAS Fort Worth JRB, Texas

Figure 5.14

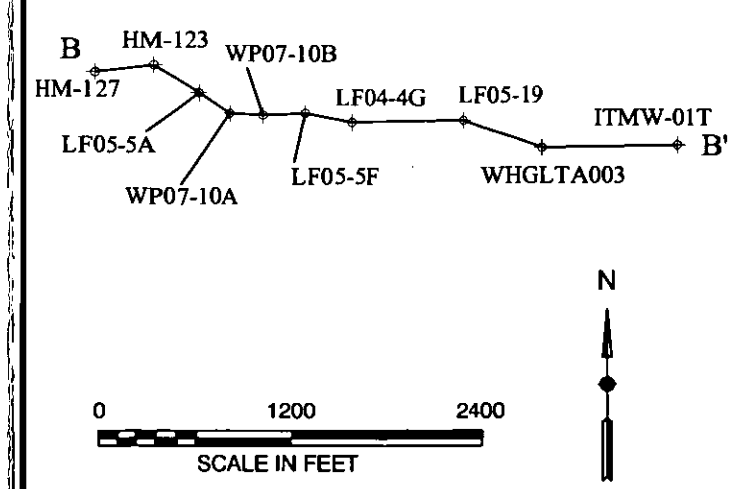
Regional Geologic Cross Section B-B'

U.S. Air Force Center For Environmental Excellence

LEGEND

	Clay		Sand
	Gravel		Gravel with Sand
	Silt		No Data - Bedrock Not Encountered
	Sand with Gravel		Bedrock
	Groundwater Elevation	0.8	TCE Concentrations (ug/L)
J	Estimated Value	ND	Not Detected

Vertical Exaggeration = 20 X



HYDRO GeoLogic INC.

Filename: F:\Fileserver1\AFC001\DO19\Boring Logs \Cross_Section_B-B(H-H).dwg
Project No: AFC001-19CD

5.3.2 Cross-Section C-C'

Cross section C-C' (Figure 5.15) depicts the stratigraphy of the Alluvial Terrace deposit and elevation of bedrock along a transect of the paleochannel within the southern lobe of the regional TCE plume. This cross-section runs south to north along the boundary of NAS Fort Worth, JRB and SWMU 24. The paleochannel is clearly evident between FT09-12C and LF05-5B. A steep rise in the elevation of bedrock at FT09-12C as well as a steep groundwater gradient to the northeast diverts the paleochannel from the southeasterly trend it has followed from AFP 4 to an easterly trend paralleling White Settlement Road.

5.3.3 Cross-Section D-D'

Cross section D-D' (Figure 5.16) depicts the stratigraphy of the Alluvial Terrace deposit from a bedrock high in the southern portion of the site, near the Wherry Housing Area, to the center of the paleochannel along White Settlement Road. The groundwater gradient (Figure 5.4) also dips steeply to the north in this area, mimicking the bedrock and ground surface. The bedrock low point along this transect is located at LF04-10; however, the presence of a clay layer just above bedrock inhibits groundwater to this point. The core of the paleochannel is found between LF04-04 and LF05-19 where the basal gravel is present. Note that the basal gravel pinches out between LF04-10 and LF04-04 as well as between LF05-19 and LF05-18.

LF04-10 and all of the monitoring wells located south of LF04-10 have historically not shown detect for TCE or TCE related compounds. In contrast, TCE concentrations ranging from 0.1 mg/L to 0.5 mg/L have been detected from samples LF04-04, LF05-19, and LF05-18.

5.3.4 Cross-Section E-E'

Cross section E-E' (Figure 5.17) depicts the stratigraphy of the Alluvial Terrace deposit at the leading edge of the regional TCE plume. The E-E' transect runs south to northeast along the axis of detected TCE concentrations. The basal gravel is present at WHGLRW019 and WHGLRW015; however, it pinches out to the south at WHGLTA023 and to the north at ITMW-01T. Bedrock along the south to north transect is relatively flat at an elevation of approximately 581 feet between WHGLRW023 and ITMW-01T; however it rises to approximately 589 feet at B-13 before dropping off to 555 feet at WHGLTA020 located near Farmers Branch Creek. A thin layer of the basal gravel is also present between WHGLTA025 and WHGLTA020.

The TCE plume ceases just east of this transect and appears to migrate north towards Farmers Branch Creek despite the rise in bedrock at B-13. Concentrations of TCE during the October-November 1999 sampling event ranged from below detection limits at WHGLRW023 and WHGLRW019 to 24 μg/L at WHGLRW015 before dropping to 8 μg/L at ITMW-01T, 9 μg/L at WHGLTA025, and below detection limits at WHGLTA020.

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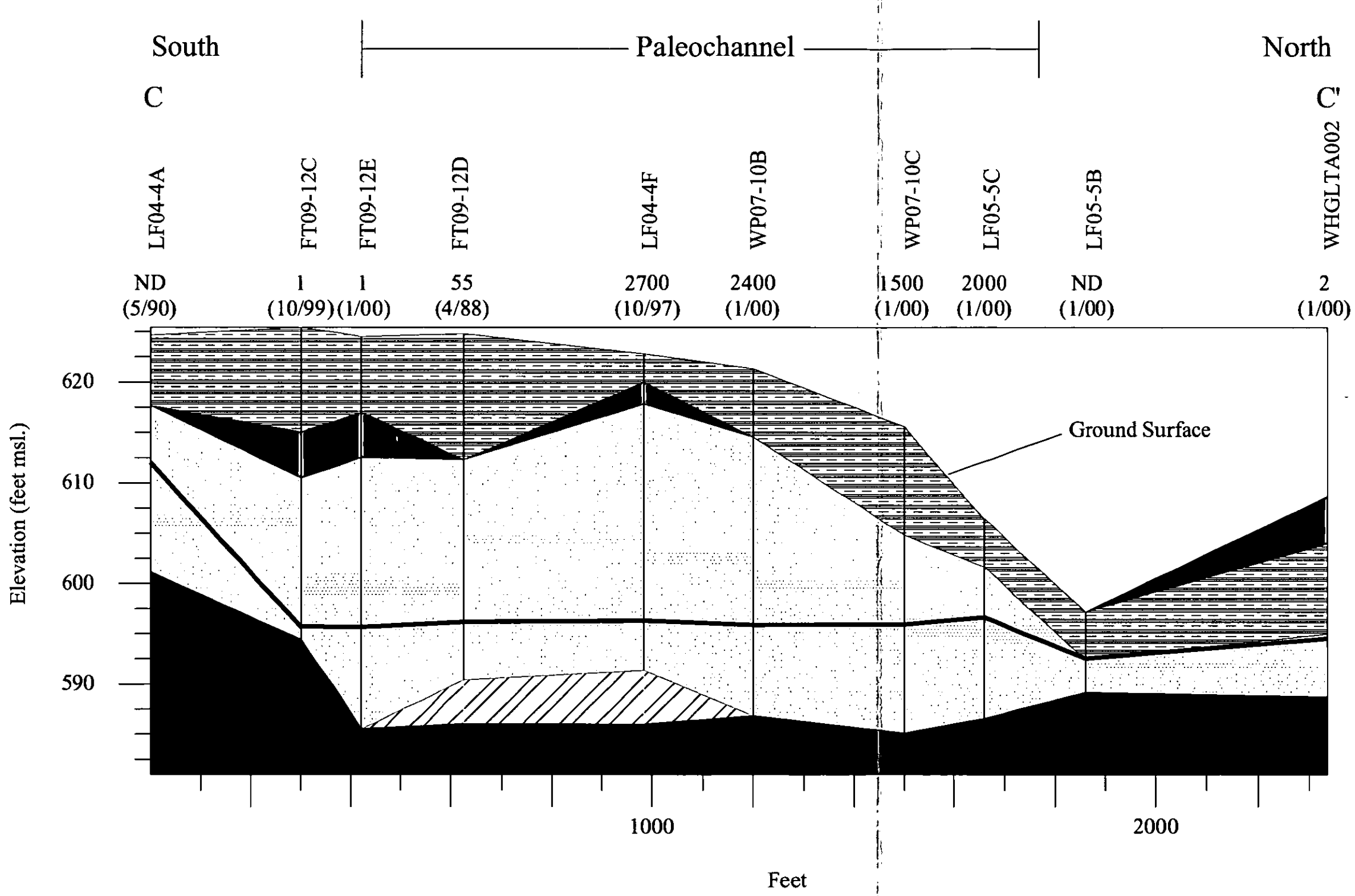


HydroGeoLogic, Inc.
Southern Lobe TCE Groundwater Plume Delineation
NAS Fort Worth JRB, Texas

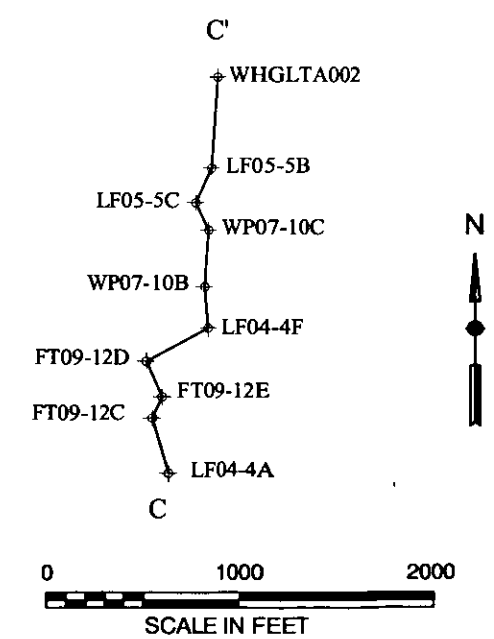
Figure 5.15

Regional Geologic Cross Section C-C'

U.S. Air Force Center For Environmental Excellence

LEGEND

- Clay
- Silt
- Sand
- Groundwater Elevation
- ND Not Detected
- No Data - Bedrock Not Encountered
- Bedrock
- 0.8 TCE Concentrations (ug/L)
- Vertical Exaggeration = 20X



HYDRO GeoLogic INC.

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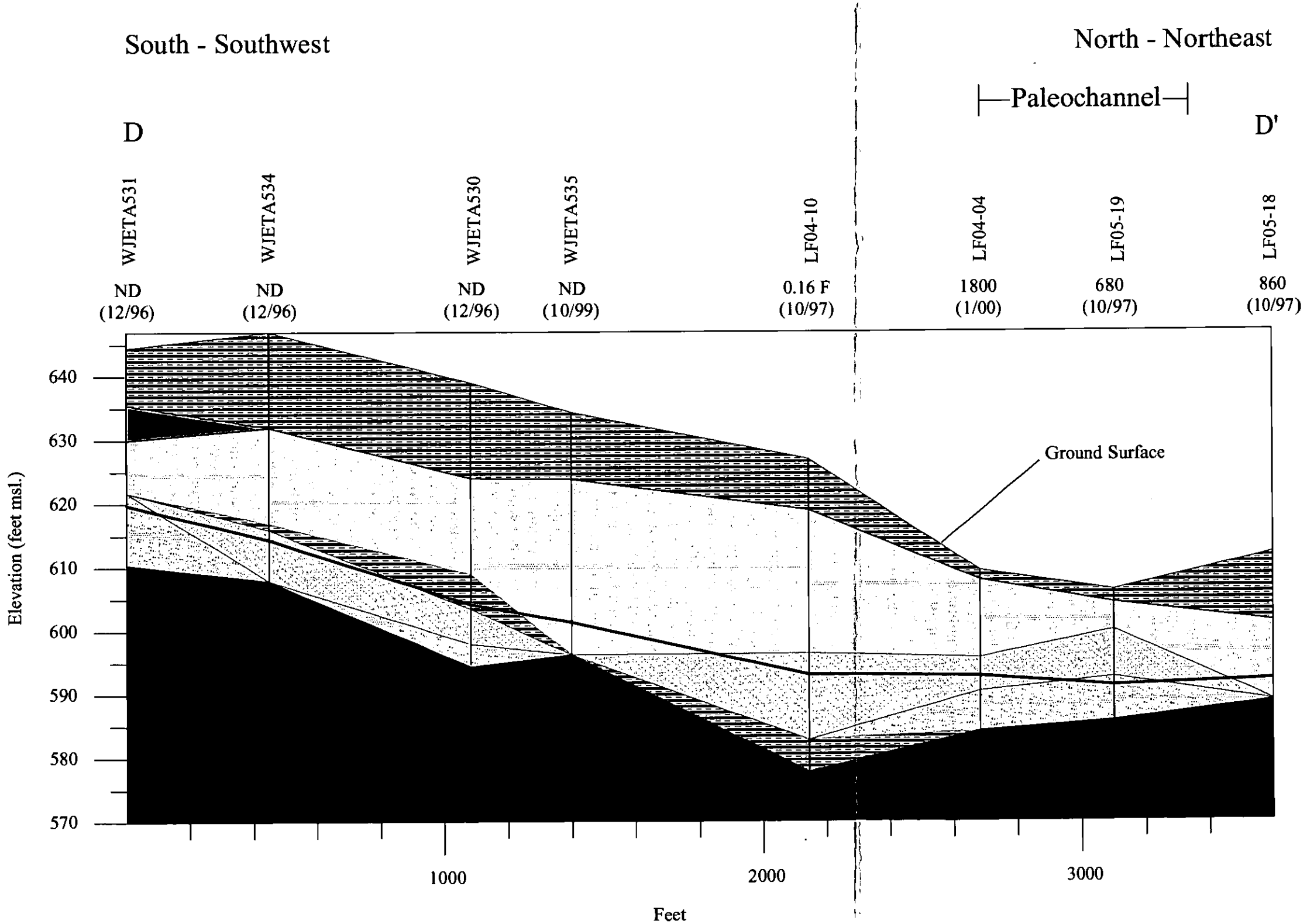
Project No: AFC001-19CD



HydroGeoLogic, Inc.
Southern Lobe TCE Groundwater Plume Delineation
NAS Fort Worth JRB, Texas

Figure 5.16

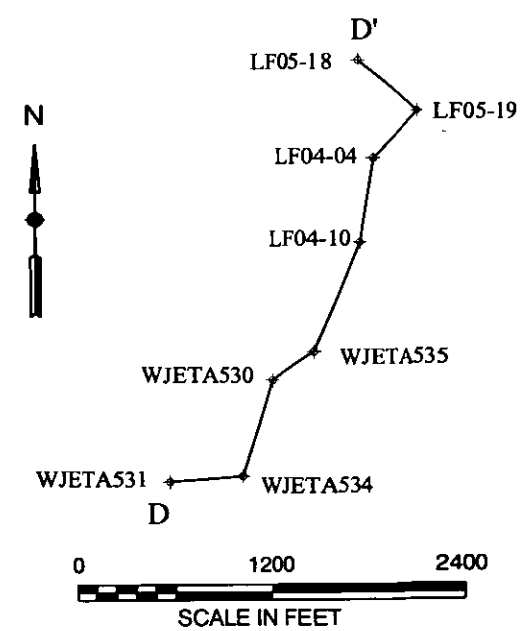
Regional Geologic Cross Section D-D'

U.S. Air Force Center For Environmental Excellence

LEGEND

- Clay
- Silt
- Sand
- Groundwater Elevation
- ND Not Detected
- Sand with Gravel
- Gravel with Sand
- Bedrock
- 0.8 TCE Concentrations (ug/L)
- F Estimated Value Below Reporting Limit

Vertical Exaggeration = 20 X



HYDRO GeoLogic INC.

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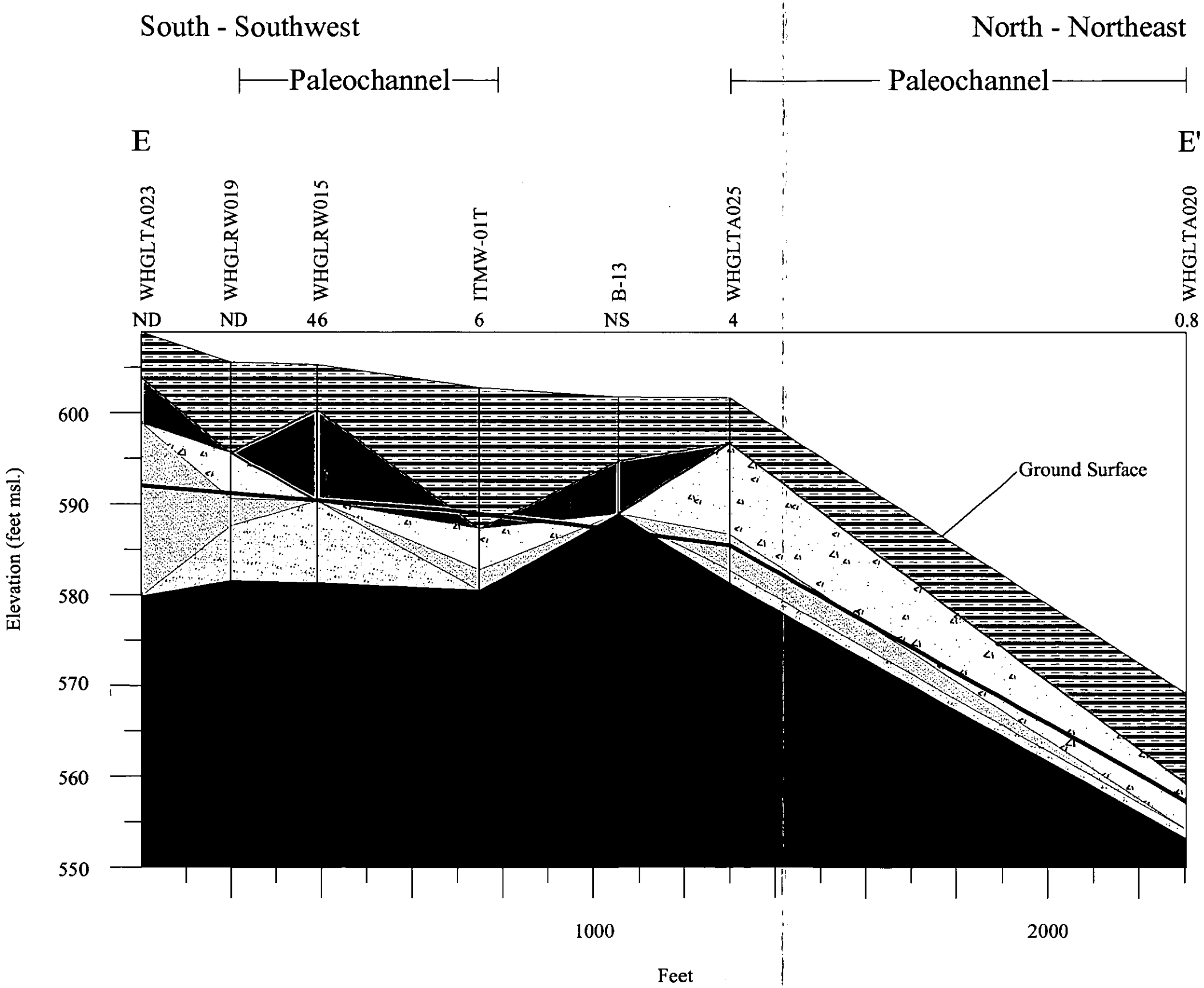


HydroGeoLogic, Inc.
Southern Lobe TCE Groundwater Plume Delineation
NAS Fort Worth JRB, Texas

Figure 5.17

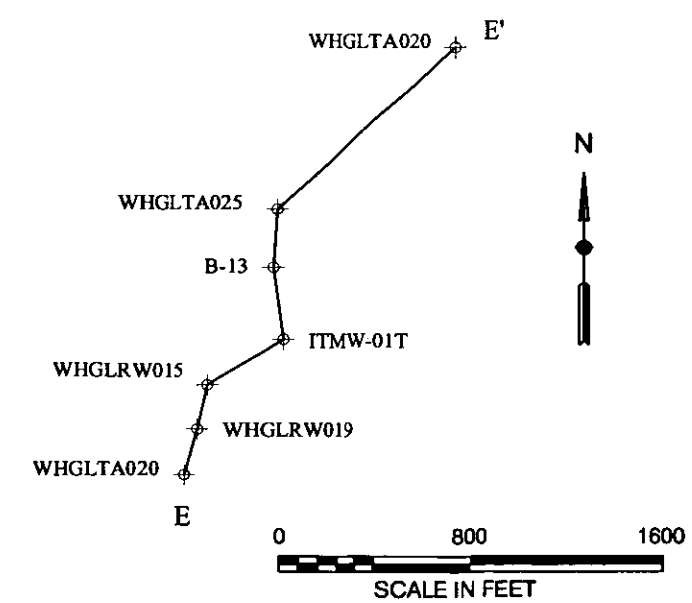
Regional Geologic Cross Section E-E'

U.S. Air Force Center For Environmental Excellence

LEGEND

	Clay		Sand with Gravel
	Silt		Gravel with Sand
	Gravel		Bedrock
	Groundwater Elevation	0.8	TCE Concentrations July 1999 (ug/L)
NS	Not Sampled	ND	Not Detected

Vertical Exaggeration = 20 X



HYDRO GeoLogic INC.

Filename: F:\Fileserver1\AFC001\DO19\Boring Logs \Cross_Section_E-E.dwg
Project No: AFC001-19CD

5.3.5 Influence of Basal Gravel, Bedrock, and Groundwater Flow on the Regional TCE Plume

Bedrock elevations (Figure 5.13) and groundwater flow (Figures 5.1 and 5.4) appear to have a dramatic influence on the direction of the TCE plume. The primary interpreted migration paths of the regional TCE plume based on the bedrock, paleochannel, and TCE data are depicted on Figure 5.13. A steep southwest to northeast groundwater gradient as well as high bedrock elevations divert the southeasterly trending TCE plume to an easterly direction in the vicinity of SWMU22. Although there is no TCE data to confirm TCE migrations towards Farmer's Branch Creek, east of the landfill area, channeling of the TCE plume towards Farmers Branch Creek appears to be occurring along the unnamed tributaries of Farmers Branch Creek in the vicinity of LF05-18 and LF05-19. Another bedrock channel located just north of WHGLTA003 may also be diverting part of the TCE plume northward towards Farmers Branch Creek. These data gaps will be resolved in an upcoming investigation.

East of WHGLTA003 a narrow bedrock channel diverts the TCE plume to the southeast. The TCE plume appears to shift where it encounters a bedrock high along route 183. This bedrock high forms the hydrogeologic divide between Farmers Branch Creek and Kings Branch Creek diverting the eastern trend of the TCE plume into a northerly trend. Evidence of this northerly trend in the TCE plume is found as decreasing concentrations of TCE in monitoring wells WHGLRW015, ITMW-01T, WHGLTA025, and WHGLTA020. WHGLRW015 appears to be in the center of a narrow channel diverting the TCE plume northward. The fact that samples from monitoring wells WHGLRW017 and WHGLRW016, located east of WHGLRW015, did not contain concentrations of TCE supports this hypothesis. Data gaps in bedrock elevation between WHGLTA015 and WHGLTA017 prevent a clear definition of eastern slope of the bedrock channel. With the current data available the exact location of the channel between B-13 and B-8 is not clearly defined at this time. These data gaps will be addressed under the upcoming data gap field investigations (HGL, 2000b).

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TAB

Section 6.0

6.0 CONCLUSIONS AND RECOMMENDATIONS

Groundwater screening data collected in 1998 were used to identify locations to install additional monitoring/recovery wells necessary to collect definitive sampling data. In 1999, nine additional wells, WHGLTA020, WHGLTA022, WHGLTA023, WHGLTA025, WHGLRW015, WHGLRW016, WHGLRW017, WHGLRW018, and WHGLRW019, were installed to bedrock along the south and southeastern border of the site near the intersection of Route 183 and White Settlement Road, as well as to the south of the base entrance. Three bi-monthly rounds of groundwater sampling were conducted at these wells.

Groundwater samples from two of the nine wells contained TCE concentrations above the RRS2/MCL concentration of 5 μg/L, and ranged from 6 μg/L in WHGLTA025 to 42 μg/L in WHGLRW015. TCE concentrations in WHGLRW015 decreased from 42 μg/L in July 1999, to 34 and 24 μg/L, in September and November 1999, respectively. All detected concentrations of *cis*-1,2-DCE were below the RRS 2 concentration of 70 μg/L, ranging from below detection limits in many wells to 15 μg/L in WHGLRW015. No detections of vinyl chloride of trans-1,2-DCE were detected above the PQL in any of the nine new wells.

The southern lobe of the regional TCE plume has been defined and bounded by a series of sentinel monitoring wells (WHGLRW016, WHGLRW017, WHGLRW018, and WHGLRW019). The TCE plume appears to have migrated onto a narrow strip of private property near the intersections of White Settlement Road, Roaring Springs Road, and Route 183 before the plume the TCE plume is diverted north by what appears to be the hydrogeologic divide between Farmers Branch Creek and Kings Branch Creek. Monitoring wells and recovery wells have been strategically located to monitor the plume.

The southern lobe of the regional TCE plume can be subdivided into northern and southern sections that are both converging on Farmers Branch Creek. The northern section crosses the phytoremediation area and SWMUs 62 and 29 before converging on Farmers Branch Creek. The southern section passes under the flightline landfill area migrating eastward along White Settlement Road before being diverted northward by several preferred pathways to Farmers Branch Creek. Concentrations of TCE in each section of the southern lobe of the regional plume tend to decrease towards Farmers Branch Creek, while concentrations of TCE breakdown products increase as the plume approaches Farmers Branch Creek.

A combination of factors combine to influence the migration directions of the southern section of the southern lobe of the regional TCE plume. These factors are bedrock elevations and groundwater flow directions which produce preferred migration pathways in bedrock channels containing the basal gravel deposit. A steep bedrock slope combined with a steep groundwater gradient to the northeast turns the TCE plume from a southeasterly trend in the flightline area to an easterly trend down White Settlement Road near SWMU 22. The bedrock valley of an unnamed intermittent tributary of Farmers Branch Creek, which flows from the flightline/landfill area, south of SWMU 22, north to Farmers Branch Creek, may be capturing the majority of the south section of the southern lobe of the TCE plume. A portion of the TCE plume bypasses the unnamed tributary valley and is directed to the southeast by a narrow

bedrock channel. It is then diverted northward within a narrow bedrock channel with a northerly groundwater flow pattern at the hydrogeologic divide between Farmers Branch Creek and Kings Branch Creek.

HydroGeoLogic recommends although there is no current data to suggest that the plume is migrating, that sentinel wells WHGLRW016, WHGLRW017, WHGLRW018, and WHGLTA019 be monitored at least semi-annually to ensure that the TCE plume is not migrating further offsite.

TAB

Section 7.0

7.0 REFERENCES

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TAB

Appendix A

APPENDIX A.1
JULY 1998 SCREENING INVESTIGATION
BORING LOGS

HYDRO GeoLogic INC.

Borehole ID: B-1

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location: Loc. #32

Date: 7/23/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
1 2 3 4		***No Recovery*** Surface is grassy and rocky, no recovery.	-4		0%			No recovery due to rock in sample tube
5 6 7		***Gravelly Silt*** 2.5YR 8/2 pale yellow Gravelly SILT with some clay and sand, low plasticity, firm, dry, poorly sorted.	-7	ML	70%	dry	0.0	
8 9 10		***Silty Clay*** 10YR 7/4 very pale brown silty CLAY, medium plasticity, stiff, dry, moderately sorted.	-10	CL	100%	dry	0.0	
11 12 13		***Silty Clay*** 10YR 7/6 yellow silty CLAY, high plasticity, stiff, damp to moist, well sorted.	-13	CH	100%	damp moist	0.0	
14 15 16		***Sandy Clay*** 10YR 5/8 yellowish brown sandy CLAY, high plasticity, very stiff, moist, well sorted.	-16	CH	100%	moist	0.0	
17 18 19		***Sandy Gravel*** 10YR 7/6 yellow sandy GRAVEL with silt, low plasticity, firm, saturated, poorly sorted.	-19	GM		satur-ated	0.0	Collected sample from 18.5 - 19.0' @ 1145
20 21 22		***Sandy Gravel*** 10YR 7/6 yellow sandy GRAVEL with silt, low plasticity, firm, saturated, poorly sorted.	-22	GM		satur-ated		Collected sample from 21.5 - 22.0' at 1155 Bedrock at 22.0' End of boring

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 2"

Total Depth Drilled: 22'

Sheet: 1 of 1

HydroGeoLogic INC.

Borehole ID: B-2

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location: Loc. #39

Date: 7/23/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
		Topsoil Grass and topsoil	-1					
1		***Clayey Sandy Silt*** 7.5YR 6/2 pinkish gray clayey sandy SILT, hard, low plasticity, dry, well sorted.	-4	ML		dry	0	
2								
3								
4		***Silty Clay*** 10BG 6/1 greenish gray silty CLAY with trace of gravel, moderate plasticity, stiff, medium sorted.	-7	CL			0	
5								
6								
7		***Gravelly Clay*** 10YR 7/6 yellow gravelly CLAY with silt, high plasticity, stiff, poorly sorted, moist to saturated.	-10	CH		moist satur. ated	0	
8								
9								
10		***Sand*** 10YR 6/8 brownish yellow SAND with silt, low plasticity, loose, saturated, well sorted.	-13	ML		satur. ated		Collected sample from 11.0 - 11.5' @ 1510
11								
12								
13		***Sand*** 10YR 6/8 brownish yellow SAND with silt, low plasticity, loose, saturated, well sorted with some gravel	-16	SM		satur. ated		Collected sample from 13.5 - 14.0' @ 1520
14								
15								
16		***Clay*** 10YR 6/8 brownish yellow CLAY with weathered bedrock, lithified layers, dry.	-17.5	CH		dry		Refusal at 17.5' , bedrock
17								
18								End of boring

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 2"

Total Depth Drilled: 17.5'

Sheet: 1 of 1

HYDRO GeoLogic INC.

Borehole ID: B-3

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location: Loc. #33

Date: 7/24/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
		Topsoil Grass and topsoil	-1					
1		***Sandy Silt*** 10YR 3/4 dark yellowish brown sandy SILT, hard, low plasticity, dry, well sorted, trace gravel.	-4	ML		dry		
2								
3								
4		***Sandy Clay*** 10YR 7/6 yellow sandy CLAY, very hard, moderate to high plasticity, very dry, well sorted.		CL		very dry		
5								
6								
7						very dry		
8			-8.5					Refusal @ 8.5' End of boring
9								
10								
11								
12								

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 2"

Total Depth Drilled: 8.5'

Sheet: 1 of 1

HYDRO GeoLogic INC.

Borehole ID: B-4

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location: Loc. #40

Date: 7/24/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
		Topsoil Grass and topsoil	-1					
1		***Silty Clay*** 7.5YR 4/3 brown silty CLAY, moderate to high plasticity, very hard, very dry, well sorted.	-4	CL		very dry		
2								
3								
4		***Silty Clay*** 10YR 7/6 yellow silty CLAY, very hard, high plasticity, very dry, well sorted.	-7.5	CH		very dry		
5								
6								
7						very dry		Refusal at 7.5' End of boring
8								
9								
10								
11								

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 2"

Total Depth Drilled: 7.5'

Sheet: 1 of 1

HYDRO GeoLogic INC.

Borehole ID: B-5

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location: Loc. #41

Date: 7/24/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
		Topsoil Grass and topsoil	-1					
1 2 3		***Silty Clay*** 7.5YR 4/3 brown silty CLAY, moderate to low plasticity, very hard, very dry, well sorted, some organic material.	-4	CL		very dry	0	
4 5 6 7		***Silty Clay*** 10YR 7/6 yellow silty CLAY, very hard, high plasticity, very dry, well to moderately sorted, trace weathered limestone, calcareous pockets and nodules.	-8	CH		very dry		
8								Refusal at 8.0' End of boring
9 10 11								

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 2"

Total Depth Drilled: 8.0'

Sheet: 1 of 1

HYDRO GeoLogic INC.

Borehole ID: B-6

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location: Loc. #30

Date: 7/25/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
1		***Topsoil*** Grass and topsoil	-1					
2–4		***Silt*** 10YR 6/3 pale brown SILT with 1/4" quartz and limestone pebbles, 10% oyster fossils and roots, gravel increases in size to 1/2" at 4'.	-4	ML		dry	0.0	No odor
5–7		***Silt*** 10YR 4/6 dark yellowish brown SILT with coarse sand and 2" gravel grading to 25% 10YR 8/2 very pale brown 2" gravel with silt, coarse sand, and very fine sand.	-7	ML		dry		
8–10		***Clay*** 10YR 3/6 dark yellowish brown CLAY with coarse sand and gravel (25%) grading to 10YR 8/2 coarse, fine, and very fine sandy gravel, 1" limestone cobbles.	-10	GM		slight moist		
11–13		***Clay*** 7YR 4/6 strong brown CLAY, soft, with coarse sand and gravel grading to 10YR 5/4 silty clay with coarse sand and 1/4" gravel at 12'.	-13	GM		moist		
14–16		***Clay*** 10YR 5/4 CLAY with fine sand grading to all clay, soft, very moist at bottom.	-16	CL		very moist		
17–19		***Clay*** Same as above with some chert pebbles.	-19	CL		very moist		
19–20		***Sand*** 10YR 6/6 brownish yellow coarse SAND with gravel.	-20					Water at 19.0' Refusal at 20' in limestone bedrock End of boring
21–22								

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 2"

Total Depth Drilled: 20.0'

Sheet: 1 of 1

HYDRO GeoLogic INC.

Borehole ID: B-7

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location: Loc. #53

Date: 7/25/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
		Topsoil Grass and topsoil	-1					
1–4		***Silt*** 10YR 2/1 black SILT with 1/8" pebbles (5%), roots, and organic debris grading to a 10YR 2/1 silty clay with subangular 1/8" quartz pebbles.	-4	ML	20%	dry	0.0	
4–7		***Silt*** Same as above with increasing percentages of gravel to 20%. Gravel ends at 6.5', only silty clay from 6.5 to 7.0'.	-7	ML	50%	dry	0.0	
7–10		***Clay*** 10YR 3/3 dark brown CLAY, medium stiff, with silt and very fine sand, some subrounded gravel (5%) and roots.	-10	ML	70%	moist	0.0	
10–13		***Clay*** 10YR 6/1 gray CLAY, very stiff, with some 2mm gravel (5%).	-13	ML	90%	moist	0.0	
13–15		***Clay*** Same as above with increasing gravel (30%) and very fine sand, angular to subrounded, 5mm to 20mm.	-15	ML	75%	moist	0.0	
15		***Sand*** 10YR 6/6 very fine SAND with some small gravel (30%), 40mm.	-15.5	SM				
16		***Gravel*** 10YR 6/6 GRAVEL (60%) with very fine sand.	-16	GM	50%	moist wet	0.0	
17–19		***Sand*** 10YR 6/4 very fine SAND with silt and gravel (20%), 5-10mm.	-19	LS				Bedrock at 19' - limestone End of boring
20–21								

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 2"

Total Depth Drilled: 19.0'

Sheet: 1 of 1

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HYDRO GeoLogic INC.

Borehole ID: B-8

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location: Loc. #38

Date: 7/25/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			Remarks
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	
		Topsoil Grass and topsoil	-1					
1		***Silt*** 10YR 5/2 grayish brown SILT with gravel, 1/8" to 1/2", angular to subrounded, and 15-25% plant roots, very hard and dry.	-4	ML		dry	0.0	
2								
3								
4		***Silt*** 10YR 5/2 very hard SILT with gravel (subrounded chert and weathered limestone pebbles).	-5	ML		dry	0.0	
5								End of boring at 5.0'
6								
7								
8								
9								

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

HydroGeoLogic, Inc.
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Hole Size: 2"

Total Depth Drilled: 5.0'

Sheet: 1 of 1

HYDRO GeoLogic INC.

Borehole ID: B-9

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location: Loc. #37

Date: 7/26/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
17		***Clay*** 10YR 7/3 stiff CLAY mottled with 10YR 7/2.	-17	ML		wet	0.0	
18		***Clay*** 10YR 6/8 brownish yellow stiff CLAY, mottled with 10YR 7/2 light gray with some quartz and limestone pebbles (3mm), subrounded to angular.		CL		wet		
19			-19.5	CL	100%	wet	0.0	
20		***Sand*** 10YR 6/3 pale brown well sorted very fine SAND, wet.	-21	SW	5%	wet		
21		***Gravelly Clay*** 10YR 6/6 brownish yellow Gravelly CLAY.	-22	CL		moist		Refusal at 22'
22								End of boring
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

HydroGeoLogic, Inc.
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Hole Size: 2"

Total Depth Drilled: 22.0'

Sheet: 2 of 2

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HydroGeoLogic INC.

Borehole ID: B-9

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location: Loc. #37

Date: 7/26/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			Remarks
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	
		Topsoil Grass and topsoil	-1					
1–4		***Silt*** 10YR 4/3 brown SILT, very hard, with some angular limestone pebbles, roots, and grass.	-4	ML	25%	very dry	0.0	
4–7		***Silt*** 10YR 6/4 light yellowish brown SILT with some fine grained sand, very hard and dry, chalky.	-7	ML	50%	dry	0.0	
7–10		***Silt*** Same as above with more fine grained sand.	-10	ML	100%	dry	0.0	
10–13		***Silt*** Same as above with some small gravel.	-13	ML	100%	dry	0.0	
13–16		***Silt*** Same as above with increasing clay content (10YR 7/2, light gray) and without gravel. Some roots.	-16	ML	100%	semi moist	0.0	

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

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Herndon, VA 20170
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Hole Size: 2"

Total Depth Drilled: 22.0'

Sheet: 1 of 2

HYDRO GeoLogic INC.

Borehole ID: B-10

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location: Loc. #45

Date: 7/26/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
1		***Silt*** 10YR 3/2 very dark grayish brown SILT with roots, grass, twigs, and bugs.	-2	ML	50%	dry	0.0	
2		***Silt*** 10YR 3/2 and 10YR 7/4 very pale brown mottled SILT with coarse sand and small gravel, 2mm to 15mm.	-4	ML		dry	0.0	
4		***Clay*** 10YR 5/1 and 10YR 5/6 mottled saprolitic CLAY, hard, with calcite veins.	-5	CL				
5								End of boring in limestone bedrock
6								
7								
8								
9								

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

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Hole Size: 2"

Total Depth Drilled: 5.0'

Sheet: 1 of 1

HYDRO GeoLogic INC.

Borehole ID: B-11

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location: Loc. #42

Date: 7/26/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
1		***Topsoil*** Grass and topsoil	-1					
2–4		***Silt*** 10YR 5/1 gray SILT with 25% gravel, 5-20mm, angular, subangular, and rounded. Some roots and grass and fine sand.	-4	ML	20%	dry	0.0	
5–7		***Silt*** 10YR 3/2 very dark grayish brown SILT with some coarse grained sand,very hard, grading to a 10YR 4/6 dark yellowish brown mottled silt with coarse grained sand and some limestone gravel (30%), 10mm.	-8	ML	50%	dry	0.0	
8		***Silt*** 10YR 5/3 mottled SILT with subrounded to subangular gravel.	-9	ML	100%	dry	0.0	
9–10		***Clayey Silt*** 10YR 5/6 yellowish brown CLAYEY SILT with fine sand.	-10	ML		semi moist		
11–13		***Gravelly Sand*** Medium to fine GRAVELLY SAND, 30% gravel, 5mm to 35mm.	-13	SP	100%	semi moist	0.0	
14		***Clayey Sand*** 10YR 7/2 light gray CLAYEY SAND, very fine grained with 5% gravel.	-14	SC		moist	0.0	
15		***Sand*** 10YR 6/4 light yellowish brown SAND, very fine grained, well sorted.	-15.5	SW		wet	0.0	Refusal at 15.5' End of boring
16								

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

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Hole Size: 2"

Total Depth Drilled: 15.5'

Sheet: 1 of 1

HYDRO GeoLogic INC.

Borehole ID: B-12

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location: Loc. #31

Date: 7/27/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
1		***Topsoil*** Grass and topsoil	-1					
2, 3		***Silty Clay*** Silty CLAY, moderate plasticity, very hard, very dry, poorly sorted with some gravel.	-4	CL		very dry		
4, 5, 6		***Gravelly Clay*** Gravelly CLAY, moderate plasticity, hard, dry, poorly sorted with some calcareous nodules.	-7	CL		dry		
7, 8, 9		***Silty Clay*** Silty CLAY with sand, high plasticity, moist, firm. Increase in sand with depth. Very moist at 9.0', some gravel at 9.5'.	-10	CH		moist		
10, 11, 12		***Sandy Clay*** Sandy CLAY with silt, high plasticity, saturated, firm. Sand layer from 11.5-12.0', trace gravel at 12.9'.	-13	CH		satur-ated		Collect sample 10.5-11.0'
13, 14, 15		***Shaley Clay*** Shaley CLAY, hard, high plasticity, dry. Platey texture, breaks on horizontal planes.	-16	CH		dry		Bedrock at 13.3'
16								End of boring @ 16.0'
17								

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

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Hole Size: 2"

Total Depth Drilled: 16'

Sheet: 1 of 1

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HYDRO GeoLogic INC.

Borehole ID: B-13

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location: Loc. #37

Date: 7/27/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
		Topsoil Grass and topsoil	-1					
1		***Fill Materials*** Caliche roadbase material with a mixture of clay.						
2				CL				
3			-4					
4		***Gravelly Clay*** Gravelly CLAY, moderate plasticity, firm, dry, crumbly, poorly sorted with some limestone gravel and shell material.						
5				CL		dry		
6			-7					
7		***Silty Clay*** Silty CLAY, high plasticity, very stiff, well sorted, damp with some orange staining. Clay breaks on horizontal planes; evidence of micro-fracturing (weathered fractures).						
8						damp		
9								
10				CH				
11						damp		
12								Bedrock at 12.8'
13			-13					End of boring at 13.0'
14								

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

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Hole Size: 2"

Total Depth Drilled: 13'

Sheet: 1 of 1

HYDRO GeoLogic INC.

Borehole ID: B-14

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location: Loc. #15

Date: 7/27/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
1		***Topsoil*** Grass and topsoil	-1					
2–4		***Silty Clay*** Dark gray silty CLAY, high plasticity, hard, dry, moderately sorted.	-4	CL		dry	0.0	
5–7		***Silty Clay*** Dark gray silty CLAY, high plasticity, stiff, damp, well sorted with some root material.	-7	CL		damp	0.0	
8–10		***Silty Clay*** Dark gray grading to yellowish brown silty CLAY, high plasticity, stiff, damp, well to moderately sorted with some calcareous nodules from 9.5 to 10.0'.	-10	CL		damp		
11–13		***Sandy Clay*** Yellowish brown sandy CLAY with gravel (and calcareous nodules), high plasticity, stiff, damp, moderately sorted.	-13	CH		damp		
14		***Sandy Clay*** Yellowish brown sandy CLAY with a trace of very fine sand and gravel, moderate plasticity, stiff, damp, moderately sorted.	-14.5	CH		damp		
15–16		***Silty Gravel*** Light yellowish brown silty limestone GRAVEL with clay, loose, poorly sorted, dry.	-16	GM		dry		
17–22		***Gravelly Sand*** Yellowish brown gravelly SAND, loose, damp, poorly sorted, gravel is angular to rounded.	-22	SP		damp		Increase in moisture
23–24		***Sandy Gravel*** Sandy GRAVEL grading to shaly CLAY, weathered, hard. Clay breaks in horizontal planes.	-24	SP		dry		End of boring at 24.0'
25								

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

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Hole Size: 2"

Total Depth Drilled: 24'

Sheet: 1 of 1

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HYDRO GeoLogic INC.

Borehole ID: B-15

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location: Loc. #28

Date: 7/27/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
1		***Topsoil*** Grass and topsoil	-1					
2–4		***Silty Clay*** 10YR 3/6 dark yellowish brown silty CLAY with sand and a trace of gravel (calcareous nodules), high plasticity, very hard, dry, moderately to poorly sorted.	-4	CL	70	dry	0.0	
5–7		***Sandy Clay*** 10YR 4/6 dark yellowish brown sandy CLAY with a trace of gravel (calcareous nodules), high plasticity, stiff, dry to damp, moderately sorted.	-7	SC	100	dry damp	0.0	
8–10		***Sandy Silty Clay*** 10YR 7/4 very pale brown sandy silty CLAY, high plasticity, firm, damp, well to moderately sorted.	-10	SC	100	damp		
11–13		***Sandy Gravelly Silt*** 10YR 4/6 dark yellowish brown sandy gravelly (calcareous nodules and alluvial deposits) SILT, moderate plasticity, firm, damp, poorly sorted.	-13	GM	70	damp		
14–16		***Sandy Silt*** 10YR 7/3 very pale brown sandy SILT with gravel, moderate plasticity, firm to stiff, damp to dry, poorly sorted.	-16	GM	70	dry damp		
17–19		***Gravelly Silt*** Gravelly SILT, loose, dry (very little recovery). Sand (as per driller) from 18.0 - 19.0'.	-19	GM	5	dry		
20–21		***Sandy Gravel*** 10YR 7/6 yellow coarse to medium sandy GRAVEL, loose, poorly sorted, saturated. Clay at 31.0' (probably weathered bedrock), clay is hard and breaks on horizontal planes.		GP		satur-ated		Collected sample 21-21.5'
22–23					20	satur-ated		
24–27					40	satur-ated		Collected sample 27-27.5'
28–30						satur-ated		
31			-31.5					End of boring at 31.5'
32								

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

HydroGeoLogic, Inc.
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Hole Size: 2"

Total Depth Drilled: 31.5'

Sheet: 1 of 1

HYDRO GeoLogic INC.

Borehole ID: B-16

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location: Loc. #23

Date: 7/28/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			Remarks
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	
		Topsoil Grass and topsoil	-1					
1–4		***Silty Clay*** 10YR 3/2 very dark grayish brown silty CLAY with trace sand (calcareous nodules), high plasticity, stiff, dry, well sorted, some organics.	-4	CL		dry	0.0	
4–7		***Silty Clay*** 10YR 3/4 dark yellowish brown silty CLAY with trace gravel (calcareous nodules), high plasticity, stiff, damp, moderately sorted with a trace of organics.	-7	CL		damp	0.0	
7–10		***Silty Clay*** 10YR 5/6 yellowish brown silty CLAY with some gravel (calcareous nodules), high plasticity, firm, moist, moderately sorted.	-10	CL		moist	0.0	
10–13		***Gravelly Clay*** 10YR 5/8 yellowish brown gravelly CLAY, high plasticity, firm, moist to very moist, poorly sorted. Gravel is composed of subangular to subrounded limestone.	-13	CL		moist v moist	0.0	
13–15		***Clayey Gravel*** Clayey GRAVEL (very little recovery).		GS				

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

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Hole Size: 2"

Total Depth Drilled: 28.0'

Sheet: 1 of 2

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HYDRO GeoLogic INC.

Borehole ID: B-16

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location: Loc. #23

Date: 7/28/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
16		***Clayey Gravel*** Clayey GRAVEL (very little recovery).						
17				GS		saturated		
18								
19			-19					
		Clayey Gravel 7.5YR 5/8 strong brown clayey GRAVEL, high plasticity, firm, saturated, poorly sorted.	-20	GS				
20						saturated		Collected sample from 21.0 - 21.5'
21		***Sandy Clay*** 7.5YR 5/8 strong brown sandy CLAY with gravel, high plasticity, firm, saturated, poorly sorted.		CL				
22			-22					
23		***Sandy Gravelly Clay*** 7.5YR 5/8 strong brown sandy gravelly CLAY with some red chert, high plasticity, firm, saturated, poorly sorted.		CL		saturated		
24			-24					Collected sample from 24.0 - 24.5'
25		***Sandy Gravel*** 7.5YR 5/8 strong brown sandy GRAVEL with some red chert, loose, saturated, poorly sorted.				saturated		
26				GP		saturated		
27								
28			-28					Refusal at 28.0'
29								End of boring
30								

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

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Hole Size: 2"

Total Depth Drilled: 28.0'

Sheet: 2 of 2

HYDRO GeoLogic INC.

Borehole ID: B-17

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location: Loc. #21

Date: 7/28/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
		Topsoil Grass and topsoil	-1					
1		***Silty Clay*** 7.5YR 2.5/3 very dark brown silty CLAY, high plasticity, firm, damp, moderately to well sorted.	-4	CL		damp		
2								
3								
4		***Gravelly Clay*** 5YR 4/6 yellowish red gravelly (calcareous nodules and chert/quartz) CLAY, moderate plasticity, firm, moist, poorly sorted.	-6	CL		moist		
5								
6		***Clayey Sand*** 5YR 4/6 yellowish red clayey SAND, low plasticity, firm, moist, moderately sorted.	-9	SC		moist		
7								
8								
9		***Sandy Gravel*** 10YR 8/3 very pale brown sandy GRAVEL (angular and subangular red chert), loose, damp, poorly sorted. Bedrock at 10.5'.	-11	SP		damp		Refusal at 11.0'
10								
11								End of boring
12								

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

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Hole Size: 2"

Total Depth Drilled: 11.0'

Sheet: 1 of 1

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HYDRO GeoLogic INC.

Borehole ID: B-18

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location: Loc. #13

Date: 7/28/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			Remarks
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	
1		***Topsoil*** Grass and topsoil	-1					
2–4		***Silty Clay*** 10YR 3/4 dark yellowish brown silty CLAY, moderate to high plasticity, stiff, dry, well sorted.	-4	CL		dry		
5–7		***Sandy Clay*** 7.5YR 5/6 strong brown sandy CLAY, very hard, very dry, well sorted.	-7	CL		very dry		
8–10		***Silty Sand*** 7.5YR 5/8 strong brown silty fine SAND with some clay, low plasticity, stiff, dry.	-10	SM		dry		
11		***Sand*** 10YR 7/3 very pale brown SAND, medium grained, loose, dry, well sorted.	-11	SW		dry damp		
12		***Silty Sand*** Silty SAND, firm, dry to damp, well sorted.	-11.5	SM				
13		***Sand*** 10YR 7/3 very pale brown SAND, loose, dry, well sorted.	-13	SW				
14–16		***Sand*** 10YR 7/4 very pale brown SAND, medium grained, loose, dry to damp, well sorted. Trace of gravel from 16.5 - 17.0'.		SW		dry damp		
17–19			-19			dry		
20–21		***Sand*** 10YR 7/4 very pale brown SAND, medium to fine grained, loose, dry, well sorted. Trace of cementation at 21.8'. Trace of weathered limestone at 24.9'.		SW				

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

HydroGeoLogic, Inc.
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Hole Size: 2"

Total Depth Drilled: 39.0'

Sheet: 1 of 2

HYDRO GeoLogic INC.

Borehole ID: B-18

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location: Loc. #13

Date: 7/28/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
22, 23, 24, 25		***Sand*** 10YR 7/4 very pale brown SAND, medium to fine grained, loose, dry, well sorted. Trace of cementation at 21.8'. Trace of weathered limestone at 24.9'.	-25			saturated		
26, 27, 28		***Gravelly Sand*** 10YR 7/6 yellow gravelly SAND, loose, saturated, poorly sorted.	-28	SP		saturated		Collected sample from 27.0 - 27.5'
29, 30, 31		***Gravelly Sand*** 10YR 6/8 brownish yellow gravelly SAND with silt, loose, saturated, poorly sorted. Gravel is rounded to subrounded. Chert in gravel. Some clay from 31.0 - 32.0'.	-31	SP		saturated		Collected sample from 30.0 - 30.5'
32, 33, 34		***Gravelly Sand*** 10YR 6/8 brownish yellow gravelly SAND, medium grained, with silt, medium grained, loose to firm, saturated, poorly sorted. Gravel is rounded to subrounded. Some chert in gravel.	-34	SP		saturated		
35, 36, 37		***Silty Gravelly Sand*** 10YR 6/8 brownish yellow silty gravelly SAND, firm, moist to saturated, poorly sorted. Moisture is preferential to the gravel zones. Some chert and limestone in gravel.	-37	SP		moist saturated		
38		***Clayey Gravelly Sand*** Clayey Gravelly SAND.	-38	SP		damp		Bedrock at 38.5'
39		***Clay*** Gray CLAY, very stiff, damp, breaks on horizontal planes.	-39	CL				End of boring at 39.0'
40, 41, 42								

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

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Hole Size: 2"

Total Depth Drilled: 39.0'

Sheet: 2 of 2

524 125

HYDRO GeoLogic INC.

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location: Loc. #50

Borehole ID: B-19

Date: 7/29/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
		Topsoil Grass and topsoil	-1					
1		***Gravelly Clay*** 10YR 8/2 very pale brown and 10YR 3/4 dark yellowish brown gravelly CLAY, very hard, very dry, poorly sorted.		CL		very dry		
2								
3								
4			-4					Refusal at 4'
								End of boring
5								
6								
7								
8								

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 2"

Total Depth Drilled: 4.0'

Sheet: 1 of 1

524 126

HYDRO GeoLogic INC.

Borehole ID: B-20

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location: Loc. #25

Date: 7/29/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			Remarks
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	
		Topsoil Grass and topsoil	-1					
1		***Silty Clay*** 10YR 8/2 very pale brown silty CLAY with gravel, very hard, very dry, poorly sorted.		CL		very dry		
2								
3								
			-4					Refusal at 4'
4								End of boring
5								
6								
7								
8								

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 2"

Total Depth Drilled: 4.0'

Sheet: 1 of 1

524 127

HYDRO GeoLogic INC.

Borehole ID: B-21

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location: Loc. #27

Date: 7/29/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
1		***Topsoil*** Grass and topsoil	-1					
2–4		***Silty Clay*** 10YR 2/2 very dark brown silty CLAY with trace of gravel, high plasticity, hard, dry, well sorted.	-4	CL		dry		
5–7		***Silty Clay*** 10YR 4/2 dark grayish brown silty CLAY, high plasticity, stiff, dry, well sorted.	-7	CL		dry		
8–9		***Clayey Gravelly Sand*** 10YR 5/2 grayish brown clayey gravelly SAND, low plasticity, stiff, dry, poorly sorted.	-9	SP		dry		
10–13		***Sand*** 10YR 7/3 very pale brown SAND, loose, dry, well sorted. Trace of gravel (medium, rounded to subrounded) from 12.5 - 13.0', and increase in moisture.	-13	SW		dry		
14–16		***Gravelly Sand*** 7.5YR 6/8 reddish yellow gravelly SAND with clay, low plasticity, firm, moist to saturated, poorly sorted with a trace of chert in gravel.	-16	SP		moist saturated		
17–22		***Gravelly Sand*** 7.5YR 6/8 reddish yellow gravelly SAND, loose, saturated, poorly sorted with trace chert in gravel.	-22	SP		saturated		Collected sample from 18.0 - 18.5'
23–25		***Gravelly Sand*** 7.5YR 6/8 reddish yellow gravelly SAND with clay, slight plasticity, firm, saturated.	-25	SP		saturated		Refusal at 25.0' End of boring
26–27								

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 2"

Total Depth Drilled: 25.0'

Sheet: 1 of 1

HYDRO GeoLogic INC.

Borehole ID: B-22

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location: Loc. #26

Date: 7/30/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
		Topsoil Grass and topsoil	-1					
1		***Silty Clay*** 7.5YR 4/4 brown silty CLAY with trace of gravel, high plasticity, stiff, dry.	-4	CL		dry		
2								
3								
4		***Caliche*** 10YR 6/4 light yellowish brown CALICHE with clay and gravel, stiff, dry.	-6.5	GM		dry		Caliche is calcareous gravel with sand and clay filling
5								
6								
7		***Sand*** 7.5YR 5/8 strong brown SAND, loose, dry, well sorted.	-9	SW		dry		
8								
9		***Silty Gravel*** 10YR 8/2 very pale brown silty GRAVEL (weathered limestone bedrock).	-10	GM				
10								Refusal at 10.0' End of boring No water encountered
11								
12								

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 2"

Total Depth Drilled: 10.0'

Sheet: 1 of 1

524 129

HydroGeoLogic INC.

Borehole ID: B-23

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location:

Date: 7/29/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
1		***Topsoil*** Grass and topsoil	-1					
2–4		***Silty Clay*** 10YR 2/1 black silty CLAY, high plasticity, very hard, dry, well sorted.	-4	CL		dry	0.0	
5–7		***No Recovery***	-7					
8–10		***Clayey Silt*** 7.5YR 8/2 pinkish white clayey SILT with trace of gravel (calcareous nodules), moderate plasticity, very hard, very dry, moderately sorted. Increase in sand from 9.0 - 10.0'.	-10	ML		very dry	0.0	
11–13		***Sandy Gravelly Clay*** 7.5YR 5/6 strong brown sandy gravelly CLAY, high plasticity, firm, moist, poorly sorted. Increase in sand with depth.	-13	CL		moist		
14–16		***Gravelly Clay*** 10YR 5/8 yellowish brown gravelly CLAY, high plasticity, firm, moist to very moist (very moist to saturated at 14'), poorly sorted.	-16	CL		moist v moist	0.0	
17–19		***Clayey Gravel*** 10YR 5/8 yellowish brown clayey GRAVEL with some sand, moderate plasticity, firm, saturated, poorly sorted.	-19	GC		satur-ated	0.0	Very little recovery
20–22		***Clayey Gravel*** 10YR 5/8 yellowish brown clayey GRAVEL with some sand, moderate plasticity, firm, very moist, poorly sorted.	-22	GC		v moist	0.0	
23		***Silty Gravel*** 10YR 5/8 yellowish brown silty GRAVEL, loose, saturated, poorly sorted.	-23	GM		satur-ated		Hit limestone bedrock at 23.0'
24–25								End of boring

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 2"

Total Depth Drilled: 23.0'

Sheet: 1 of 1

HYDRO GeoLogic INC.

Borehole ID: B-24

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location:

Date: 7/31/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
		Topsoil Grass and topsoil	-1					
1		***Gravelly Clay*** Gravelly CLAY, high plasticity, stiff, damp, moderately sorted.	-3	CL		damp		
2								
3		***Sandy Clay*** 10YR 5/8 yellowish brown sandy CLAY, high plasticity, stiff, damp, well sorted.	-4	CL		damp		
4		***Sandy Clay*** 10YR 5/8 sandy CLAY, high plasticity, firm, moderately sorted.	-5	CL				
5		***Clayey Sand*** 10YR 5/8 yellowish brown clayey SAND, high to moderate plasticity, moist to saturated, moderately sorted.	-6	SC		moist saturated		
6		***Sandy Clay*** 10YR 5/8 yellowish brown sandy CLAY, high plasticity, firm.	-6.5	CL		moist		
7		***Clayey Gravel*** 10YR 5/8 yellowish brown clayey GRAVEL, moderate plasticity, firm, moist, poorly sorted.	-8	GC				Refusal at 8.0' in limestone bedrock
8								End of boring
9								
10								

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 2"

Total Depth Drilled: 8.0'

Sheet: 1 of 1

524 131

HYDRO GeoLogic INC.

Borehole ID: B-25

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location:

Date: 7/31/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
		Topsoil Grass and topsoil	-1					
1		***Silty Clay*** 10YR 2/1 black silty CLAY, high plasticity, firm, damp, well to moderately sorted. Some gravel from 2.0 - 2.7', increasing with depth.	-3	CL		damp	0.0	
2								
3		***Gravelly Clay*** 10YR 6/2 light brownish gray gravelly CLAY, firm, damp, poorly sorted.	-4	CL				
4		***Sandy Clay*** 10YR 6/2 light brownish gray sandy CLAY with some gravel, moderate plasticity, firm, damp, well to moderately sorted. Chunk of gravel at 7.0'.	-7	CL		damp	0.0	
5								
6								
7		***Gravelly Silt*** 10YR 8/3 very pale brown gravelly SILT with sand, loose, damp, poorly sorted.	-10	GM		damp	0.0	
8								
9								
10		***Sandy Silty Gravel*** 10YR 5/8 yellowish brown sandy silty GRAVEL, firm, moist to saturated, poorly sorted.	-12.5	GM		moist satur-ated	6.0	Refusal at 12.5' in bedrock End of boring
11								
12								
13								
14								

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 2"

Total Depth Drilled: 12.5'

Sheet: 1 of 1

HYDRO GeoLogic INC.

Borehole ID: B-26

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location:

Date: 7/31/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
		Topsoil Grass and topsoil	-1					
1		***Silty Clay*** 10YR 2/1 black silty CLAY, high plasticity, stiff, damp, well sorted.	-4	CL		damp		
4		***Sandy Clay*** 10YR 6/3 pale brown sandy CLAY with some gravel, high plasticity, stiff, damp.	-10	CL		damp		
7						damp		
10		***Clayey Gravel*** 10YR 7/6 yellow clayey GRAVEL with silt, low plasticity, moist, poorly sorted.	-11.5	GC		moist		
12		***Sand*** 10YR 6/3 pale brown SAND with trace gravel, firm, saturated, moderately sorted.	-13	SW				
13		***Sandy Gravel*** 10YR 6/6 brownish yellow sandy GRAVEL, loose, saturated, poorly sorted.	-14	GP		satur-ated		End of boring at 14.0' in bedrock
14								
15								
16								

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 2"

Total Depth Drilled: 14.0'

Sheet: 1 of 1

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HYDRO GeoLogic INC.

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location:

Borehole ID: B-27

Date: 8/1/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
		Topsoil Grass and topsoil	-1					
1		***Silty Clay*** 10YR 2/1 black silty CLAY, high plasticity, stiff, damp, well sorted.	-4	CL		damp		
2								
3								
4		***Sandy Clay*** Sandy CLAY, very hard (no recovery).	-6	CL				Very hard at 5.5' Refusal at 6' End of boring
5								
6								
7								
8								

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 2"

Total Depth Drilled: 6.0'

Sheet: 1 of 1

HYDRO GeoLogic INC.

Borehole ID: B-28

Project No: AFC001-18BB

Project: NAS FTW TCE Plume Delineation

Client: AFCEE

Location:

Date: 8/1/98

Geologist: Brad Nielsen

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
		Topsoil Grass and topsoil	-1					
1		***Silty Clay*** Silty CLAY, high plasticity, stiff, damp, well sorted.	-4	CL		damp		
2								
3								
4		***Sandy Clay*** Sandy CLAY with gravel, very hard, very dry.	-7	CL		very dry		
5								
6								
7		***Sandy Clay*** Sandy CLAY with trace gravel, very hard, very dry.	-9	CL		very dry		Very little recovery
8								
9								Refusal at 9.0' End of boring
								No water encountered
10								
11								

Drilled By: Precision

Drill Method: DPT

Drilling Equipment: XD-2

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 2"

Total Depth Drilled: 9.0'

Sheet: 1 of 1

APPENDIX A.2
JULY 1998 SCREENING INVESTIGATION
FIELD NOTES

12 June 1988 Sunny (98°) breezy Brad Nielsen

0830 Arrived fieldhouse. Schwarz Trice (HAL) on site.
0930 Drillers arrive at fieldhouse. Conduct health and safety meeting with the above members.
0950 Mob to LC-9 to perform one boring (BHLM924).
1015 Start drilling at BHLM924
1020 Refusal reached at 11.0 ft. Offset location to east 10 ft.
1050 Total depth reached at 16 ft bgs. Groundwater encountered at 15 ft bgs. Some hard material to 8 ft bgs. Samples were lithologically described but no chemical analysis.
1100 Break for lunch.
1400 Return from lunch. Drillers pack up rig and sampling equipment.
1500 Drillers return to fieldhouse. Complete paperwork.
1650 Drillers off site.

Brad Nielsen 6/14/88

23 July 1998 Sunny Hot (102°), light breeze Bob Bielsen

0730 Calibrate PID and load gluser collect sampling equipment
1000 Move to location of B-1
1010 Runner on site is clear some time to move battery
1020 Begin drilling at B-1 Harrison is the drilling company
Noel Floyd Hanson is the driller, Tom Tom is the helper.
1145 Collected soil sample from 18.5-19.0'. Sample was
marked and immediately given to the mobile lab (TEO)
for TCE analysis. Sample is saturated
1155 Collected sample from 21.5-22.0'. Sample is saturated
1230 Break for lunch.
1330 Return from lunch
1400 Finish boring. Set temporary well at total depth of 22.0'
Use 5' of screen at bottom.
1435 Begin drilling at B-2
1510 Collect sample from 11.0-11.5'. Sample is saturated
1515 Collected sample from 13.5-14.0'. Sample is saturated
1540 Reach total depth of 17.5' bgs. Set temp.
well at total depth. Use 5' of screen. Riser to surface
1800 Return to field house
1800 Leave site for day

Bob Bielsen 7/27

24 July 1998 Sunny Hot (108°), light breeze Brad Nielsen

0910 Arrive on-site. Precision arrives on-site. Cal Brown
AT Paul and Lee Bazer with field sampling equipment.
Drillers doing maintenance on rig and support vehicle. Battery
is charged, load equipment on trailer.
0930 Begin drilling at B-3 along Hwy 183
1010 HA refusal at 7' offset location to the west in 20th
1050 HA refusal again at 8.5' will offset across 183.
Breakdown equipment.
1200 Break for lunch.
1300 Return from lunch. Drillers go to hardware store to
pick up battery.
1330 Move to B-4
1400 Start drilling at B-4
1440 Refusal at 4.5'
1505 Start drilling at B-5
1545 HA refusal 7.5'
1600 Start breaking down equipment.
1635 Return to field office.
1800 Leave site for day

Brad Nielsen 7/24/98

(38)

27 July 1
0800 Arriv
0810 Call
0830 Mov
0835 Call
0845 Rea
Set
0900 Mov
015 Set
120 Rea
Mo
145 Brea
245 Retu
300 Mob
315 Start
430 Rea
on
wi
535 Sta
640 Cal
655 Call
700 Rea
w
the
po
Tea
015 Lea

27 July 1988 Sunny, Hot (103°) light breeze Brad Olelsen

0800 Arrive on site from Austin.
0810 Calibrate PID
0830 Mob to B-14 where Precision Drilling is already located.
0835 Collected saturated soil sample from 105-110'.
0845 Reach total depth at 116'. Bedrock is at 13.5'.
Set temp. well at 16' w/ 5 ft of screen and riser to surface.
0900 Mob to decon area to dump decon water.
0915 Set up at B-13 on Roaring Springs. Start drilling.
1120 Reached total depth at 13.0'. Bedrock started at 12.8'.
No water encountered. Abandon boring. No sample collected.
1145 Break for lunch
1245 Return from lunch.
1300 Mob to boring location B-14 on Mathers St and Duncan.
1315 Start drilling. Bottom is 43 ft off a PG&S boring location.
1430 Reach total depth at 24'. Bedrock at 23.5'. No water encountered. No sample collected. Set temporary well at 24' w/ 5 ft screen and riser to surface.
1535 Start drilling at B-15
1640 Collected sample from 21-21.5
1655 Collected sample from 27-27.5
1700 Reached total depth at 31.5'. Set temporary well at w/ 27 w/ 5 ft of screen and riser to surface.
Had problem with heaving sands. Use a disposable (plastic) point to drive casing to total depth to install the temp. well. Return to field office to complete paperwork
2015 Leave site for day.

Brad Olelsen 7/27/88

18 July 1998 Sunny, Hot (103°). light breeze Brad Nielsen

0710 Arrive on site. Precision (Paul Henson & Todd Jewell) also on site. Calibrate PID and Lead Blazer w/ field sampling equipment and supplies.
0800 Mob to B-16
0825 Start drilling at B-16.
0930 Collected sample from 21-21.5 from saturated soil.
0935 Collected sample from saturated soil at 24-24.5.
1000 Hit refusal at 28.0'. Bedrock at 27'. Set temporary at 28.0' w/ 5 ft of screen and riser to surface.
1015 Mob to B-17 at 108 Bill Mitchell Dr.
1020 Reach total depth of B-17. Hit refusal.
1200 Break for lunch.
1300 Return from lunch.
1320 Tim Sewell (TNRCC) on site. Cindy Fox (EPA) also on site.
1340 Offset boring B-17 to determine if refusal at B-17 was bedrock.
1410 Reach 9' in B-17 and hit bedrock. Breakdown equipment.
1500 Mob to B-18 on Hole #10 at golf course in #13.
1535 Start drilling at B-18.
1705 Collect sample from 27-27.5'
1720 Collected sample from 30-30.5ft
1800 Reached total depth of boring at 32.0'. Bedrock at 38.5'. Set well at 33.0' w/ 5 ft of screen and riser to surface.
1825 Return to field office to complete paperwork.
1845 Leave site for day.

1/28/98

19 July 199

0705 Arrive
0725 Precision
0730 Conduct
0745 Pick up
0830 Arrive
0850 Rig bite
1000 Reason
1030 Begin d
1040 Hit ref
1045 Begin d
1100 Third a
down e
1130 Set tem
1140 Begin d
1150 Hit re
1200 Break
1230 Break
1440 Driller
1500 Start
1550 Colle
1615 Hit
well
1630 Break
1730 Return
1800 Leave

Nelson

site.
ment

al

98

29 July 1998 Sunny, Hot (103°), light breeze Brad Nelson

0715 Arrive on-site. Pee Ann Kelly (United) also on-site.
0725 Precision is on site (Paul Hanson + Todd Jewell)
0730 Conduct Health and Safety meeting with above members present.
0745 Pick up rig and support vehicle from golf course. And mob to B-19
0830 Arrive at B-19 on Leonard Frost property.
0850 Rig blew a hydraulic hose. Down time to complete repairs.
1000 Return to rig and set up for drilling
1030 Begin drilling at B-19
1040 Hit refusal at 3'. Off set location by 10'
1045 Begin drilling. Hit refusal at surface (1-2'). Off set again
1100 Third attempt, hit refusal at 4'. Abandon boring location. Break down equipment and mob to next location
1130 Set up at B-20 on 18S. along east side at loc. # 25
1140 Begin drilling
1150 Hit refusal at 4.0'. Very hard and very dry clay is the reason.
1200 Breakdown equipment and mob to B-21 & 104 Timber Dr.
1230 Break for lunch.
1440 Drillers return from lunch.
1500 Start drilling at B-21
1550 Collect sample from saturated soil at 18-18.5'
1615 Hit refusal at 25.0'. Total depth at 25.0. Set well at 25.0' w/ 5' screen and riser to surface.
1630 Breakdown equipment.
1730 Return to field office.
1800 Leave site for day.

7/29/98

524 142

30 July 1998 Sunny, Hot (103°), light breeze Brad Nielsen

0730 Arrive on-site. Precision on-site (Paul Hansen, Todd Tewell). Bobcat (HGL) on-site.
0800 Calibrate PID and load sampling equipment. Drillers are filling water tank w/ truck.
0830 Mob to location of B-22. Set up rig and equipment.
0850 Start drilling at B-22 (Loc #16).
0910 Reach total depth of 10' at B-22. Hit bedrock at 9.0'. No water encountered. Abandoned boring.
0930 Start breaking down equipment. Precision rig breaks a clamp cylinder. Unable to continue until cylinder is replaced. Cylinder will be coming from California via Fed Ex overnight.
1130 Break for lunch.
1230 Return from lunch.
1300 Drillers taking care of miscellaneous tasks. Brad is completing paperwork. Drums in drum storage area need to be removed and additional drums need to be transported to this area from various locations on-site. Bob w/ HGSA about transporting small bobcat w/ drum grapples. Various other tasks are taken care of.
1600 Sit in on conference call w/ Jim Costello regarding workplan for DSTS on site at Caswell AFB.
1730 Bobcats delivered to site, begin moving drums and retrieving ones not currently secure which were produced during the DOIG activities.
2000 Finish with drums for today.
2030 Leave site for day.

Brad Nielsen 7/30/98

(33)

31 July 19

0730 Arrive
0830 Mob to
drums, co
installat
1000 Return fo
miscelane
1100 Break
1300 Return
for dr
1500 Begin d
1630 Reache
collecte
screen
move
1815 Begin d
1850 Reach fo
collecte
of scre
to nex
1910 Begin d
1930 Reach
collecte
w/ 5
to nex
1945 Begin
2010 Reach
collec
w/ 5
equipm
2100 Leave

[redacted]

31 July 1998 Sunny, Hot (102°), light breeze. Brad Nielsen

0730 Arrive on-site. Precision is already onsite.
0830 Mob to Parson's wells area (GHELTA001) to pick up drums, which contain soil cuttings from well/boring installation. Drop off drums at drum storage area.
1000 Return to field house. Take care of paper work and other miscellaneous activities.
1200 Break for lunch.
1300 Return from lunch. Drillers are repairing rig and preparing for drilling in afternoon.
1500 Begin drilling at B-23
1630 Reached total depth at 23.0'. No soil samples were collected. Temporary well was set at 23.0' w/ 5 feet of screen and riser to surface. Break down equipment and move to next location on golf course.
1815 Begin drilling at B-24
1850 Reach total depth at 8.0' No soil samples were collected. A temporary well was set at 8.0' and 5 feet of screen was used w/ riser to surface. Move to next location on golf course.
1910 Begin drilling at B-25.
1930 Reach total depth of 12.5'. No soil samples were collected. A temporary well was installed at 12.5 feet w/ 5 ft of screen and riser to the surface. Move to next location.
1945 Begin drilling at B-26.
2010 Reach total depth of 14.0'. No soil samples were collected. A temporary well was installed at 14.0' w/ 5 ft of screen and riser to surface. Break down equipment and return to field house.
2100 Leave site for day.

1/31/98

8/1/98 Brad Nielsen

0800 Arrive on site. Precision drilling on site.
Conduct Health and Safety meeting
0850 Leave Rel House to stake temporary well location
0855 Receive analytical data from lab. Temporarily B-
not 7.1 ug/L TCE. Will now install points further
out of plume to delineate boundary.
0910 Begin taking water levels and stake locations.

	well ID	DTW (FTOC)
0914	B-1	14.85'

0930 Drillers are ready to begin drilling at B-27 to delineate the extent of contamination to the east.
0940 Begin drilling at B-27
1000 Hit refusal at 5.5'. Very hard material. Abandon boring and set to next boring location approximately 100' to the south.
1030 Begin drilling at B-28.
1110 Hit refusal at 7.0'. Very hard material. Abandon boring location. Will not attempt another location due to hardness of material.
1130 Break for lunch.
1300 Return from lunch.
1315 Resume collecting water level information and placing stakes at boring locations for surveyors to identify.

Time	well ID	DTW	TD	
1375	B-21	14.74	23.07	
1390	B-26	13.37	14.75	also collected groundwater sample
1405	B-25	11.61	13.17	also collected groundwater sample
1415	B-24	4.27	7.81	also collected groundwater sample
1455	B-10	15.35	20.33	
1506	B-23	15.37	21.09	
1515	B-15	18.44	27.45	
1520	B-16	21.42	29.26	
1530	B-18	27.89	36.22	
1545	B-12	8.05	16.18	
	B-11	No water level B/c well was accidentally removed		
	B-7	"	"	"
	B-6	"	"	"
1630	B-2	10.02	18.07	

1700 Return to Rel office. Unload all equipment from truck and finish paperwork.
1745 Leave site for Austin

8/1/98

(34)

8/10/98

Made ...
the ...

524 145

Nelson

8/10/92

Brad Nelson

Made photocopies of fieldbook entries and sent the copies to be filed in Herndon VA office

Brad Nelson 8/10/92

APPENDIX A.3
JULY 1998 SCREENING INVESTIGATION
CHAINS OF CUSTODY

Transglobal Environmental Geochemistry
CHAIN-OF-CUSTODY RECORD

teg

P.O.# _____

CLIENT: HYDROGEOLOGIC

DATE: 7-23-98

PAGE 1 OF 1

ADDRESS:

TEG PROJECT #: T1980722

PHONE: FAX:

LOCATION: NAS FT WORTH JRB

CLIENT PROJECT #: PROJECT MANAGER:

COLLECTOR: DATE OF COLLECTION:

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: VOA 601/8010	VOA 602/8020	MTBE	Methane	TPH 418.1	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (sig # 4)	PNA 610/8100	PEST/PCBs 8080	Oxygen	Nitrogen	Carbon Dioxide	FIELD NOTES	Total No. of Containers	Laboratory Note No.
SPRING-1	1.5'	1000	H_2O	2 VOA	X															
B-1	19.5-20	1150	SOIL	6" ACE.	X															
B-1	21.5-22	1200	SOIL	3" ACE.	X															
B-1 H_2O	—	1339	H_2O	2 VOA	X															
MW-IT-OTT	—	1435	H_2O	2 VOA	X															
B-2 11-11.5	11-11.5	1516	SOIL	3" ACE.	X															
B2 13.5	13.5-14	1530	SOIL	6" ACE.	X															
B-2 H_2O	—	1648	H_2O	2 VOA	X															

RELINQUISHED BY (Signature) DATE/TIME RECEIVED BY (SIGNATURE) DATE/TIME 7/23/98

RELINQUISHED BY (Signature) DATE/TIME RECEIVED BY (SIGNATURE) DATE/TIME

SAMPLE RECEIPT

Total No. of Containers	
Seals Intact? Y/N/NA	
Received Good Cond./Cold	
Notes:	

Laboratory Notes:
4 H_2O
4 SOIL

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL/$2.00@ ☐ RETURN ☐ PICKUP

MMP 11/95

524 147

524 148

Transglobal Environmental Geochemistry
CHAIN-OF-CUSTODY RECORD

P.O.# _____

CLIENT: HYDROGEOLOGIC

DATE: 7-25-98 PAGE 1 OF 1

ADDRESS:

TEG PROJECT #: T1980722

PHONE: FAX:

LOCATION: NAS FT WORTH JRB

CLIENT PROJECT #: PROJECT MANAGER:

COLLECTOR: DATE OF COLLECTION:

Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020	MTBE	Methane	TPH 418.1	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (g & d)	PNA 610/8100	PEST/PCBs 8080	Oxygen	Nitrogen	Carbon Dioxide	FIELD NOTES	Total No. of Containers	Laboratory Note No.
B-6	16-16.5	10:00	Soil	~~4oz~~ ACE	X															
B-6	19.5-20.0	10:20	Soil	4oz ACE	X															
B-6	15.5	10:45	water	2 VOA	X															
FBC-1	~~1250~~	1250	H_2O	2 VOA	X															
FBC-2		1309	H_2O	2 VOA	X															
SPRING-2		1309	H_2O	2 VOA	X															
FBC-1		1335	H_2O	2 VOA	X															
FBC-2		1339	H_2O	2 VOA	X															
FBEB-1		1340	H_2O	2 VOA	X															
B-7	15-15.5	1530	Soil	4oz	X															
B-7	18.5-19.0	1545	Soil	4oz	X															
B-7	14.0	1600	H_2O	2 VOA	X															
																		4 SOIL & WATER		

RELINQUISHED BY (Signature) DATE/TIME RECEIVED BY (SIGNATURE) DATE/TIME 7-25-98

RELINQUISHED BY (Signature) DATE/TIME RECEIVED BY (SIGNATURE) DATE/TIME

SAMPLE RECEIPT

Total No. of Containers	
Seals Intact? Y/N/NA	
Received Good Cond./Cold	
Notes:	

Laboratory Notes: NO SAMPLES ON 7-24, LAB ON SITE

SAMPLE DISPOSAL INSTRUCTIONS

G DISPOSAL/$2.00@ | | RETURN | | PICKUP

MMP 11/95

Transglobal Environmental Geochemistry
CHAIN-OF-CUSTODY RECORD

P.O.# _____

CLIENT: HYDROGEOLOGIC

ADDRESS: 1155 Herndon Parkway Suite 900

PHONE: 703-736-4565 FAX: 703-471-4180

CLIENT PROJECT #: AFC001-18 PROJECT MANAGER: Robert Wallace

DATE: 7-26-98 PAGE 1 OF 1

TEG PROJECT #: T1980722

LOCATION: NAS FT WORTH JRB

COLLECTOR: Bob Wallace DATE OF COLLECTION:

Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020	MTBE	Methane	TPH 418.1	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 Sig & #1	PNA 610/8100	PEST/PCBs 8080	Oxygen	Nitrogen	Carbon Dioxide	FIELD NOTES	Total No. of Containers	Laboratory Note No.
B-9	16-16.5	0825	Soil	Acetate line	X															
B-9	18-18.5	0830	Soil	4oz Glass	X															
B-9	19.5-20	0835	Soil	" "	X															
B-9	21.5-22	0845	Soil	" "	X															
B-9	15.8	845	water	40ml VOA(2)	X															
B-11	14.5-15	1135	SOIL	4oz GL	X															
B-11 H_2O	H_2O	1200	H_2O	2 VOA	X															
POND-1	—	1235	H_2O	2 VOA	X															
MW101T	—	1345	H_2O	2 VOA	X															
E. BLANK	—	1345	H_2O	2 VOA	X															

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (SIGNATURE)	DATE/TIME
[signature]		[signature]	7/26/98
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (SIGNATURE)	DATE/TIME

SAMPLE RECEIPT

Total No. of Containers	
Seals Intact? Y/N/NA	
Received Good Cond./Cold	
Notes:	

Laboratory Notes:
5 SOIL
5 H_2O

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL/$2.00@ ☐ RETURN ☐ PICKUP

MMP 11/95

524.149

524 150

Transglobal Environmental Geochemistry
CHAIN-OF-CUSTODY RECORD

P.O.# _____

CLIENT: HydroGeologic Inc.
DATE: 7/27/98
PAGE 1 OF 1

ADDRESS: 1155 Herndon Parkway Suite 900 Herndon MD 20170
TEG PROJECT #: ~~AFC001-18bb~~ J1980722

PHONE: 703-478-5186
FAX: 703-471-4180
LOCATION: NAS FT WORTH JRB

CLIENT PROJECT #: AFC001-18bb
PROJECT MANAGER: Robert H Wallace B.G.
COLLECTOR:
DATE OF COLLECTION:

Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020	MTBE	Methane	TPH 418.1	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (g & d)	PNA 610/8100	PEST/PCBs 8080	Oxygen	Nitrogen	Carbon Dioxide	FIELD NOTES	Total No. of Containers	Laboratory Note No.
Spring 3	-	0745	water	2 VOA																
Spring 4N	-	0800	water	2 VOA																
Spring 5	-	0930	water	2 VOA																
B-12	10.5-11.0	0930	soil	Acetate Sleeve																
B-12	15'	1150	water	2 VOA																
WHGLTA003		1500	water	2 VOA																
LF04-10		1550	water	2 VOA																
B-15	21-21.5	1640	soil	acetate Sleeve																
B-15	27-27.5	1650	soil	acetate Sleeve																

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (SIGNATURE)	DATE/TIME
Robert H Wallace	7/27/98	[illegible]	7/27/98
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (SIGNATURE)	DATE/TIME

SAMPLE RECEIPT

Total No. of Containers	
Seals Intact? Y/N/NA	
Received Good Cond./Cold	
Notes:	

Laboratory Notes:
3 SOIL
6 H_2O

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL/$2.00@ ☐ RETURN ☐ PICKUP

MMP 11/95

Transglobal Environmental Geochemistry
CHAIN-OF-CUSTODY RECORD

teg

P.O.# _____

CLIENT: HYDROGEOLOGIC

DATE: 7-28-98

PAGE 1 OF 1

ADDRESS: 1155 Herndon Parkway · Suite 900 Herndon VA 20170

TEG PROJECT #: T1980722

PHONE: 703 478-5186

FAX: 703 471-4180

LOCATION: NAS FT WORTH JRB

CLIENT PROJECT #: AFC 001-18bb

PROJECT MANAGER: Robert Wallace

COLLECTOR:

DATE OF COLLECTION:

Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020	MTBE	Methane	TPH 418.1	TPH 8015 (gasoline)	TPH 8015 (diesel)	PNA 610/8100	PEST/PCBs 8080	Oxygen	Nitrogen	Carbon Dioxide	FIELD NOTES	Total No. of Containers	Laboratory Note No.
B-16	21-21.5	935	SOIL	ACETATE	X														
B-16	24-24.5	935	SOIL	"	X														
B-15	H_2O	945	H_2O	2VOA	X														
B-16	H_2O	1030	water	2VOA	X														
LF05-18	H_2O	1140	water	2VOA	X														
LF05-19	H_2O	1505	water	2VOA	X														
KBC-3	H_2O	1600	water	2VOA	X														
EB-3	H_2O	1700	H_2O	2VOA	X														
B-18	27-27.5	1715	SOIL	Acetatate	X														
B-18	30-30.5	1720	SOIL	"	X														

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (SIGNATURE)	DATE/TIME
Robert Wallace		[illegible]	7-28-98
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (SIGNATURE)	DATE/TIME

SAMPLE RECEIPT

Total No. of Containers	
Seals Intact? Y/N/NA	
Received Good Cond./Cold	
Notes:	

Laboratory Notes:
4 SOIL
6 H_2O

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL/$2.00@ ☐ RETURN ☐ PICKUP

MMP 11/95

524 151

Transglobal Environmental Geochemistry
CHAIN-OF-CUSTODY RECORD

teg

P.O.# _____

524 152

CLIENT: Hydrogeologic Inc.

DATE: 7/29/98 PAGE 1 OF 1

ADDRESS: 1155 Herndon Parkway Suite 900 Herndon VA

TEG PROJECT #: T1980722

PHONE: 703-478-4565 FAX:

LOCATION: NAS FT WORTH JRB

CLIENT PROJECT #: AFC001-18

PROJECT MANAGER: Robert Wallace

COLLECTOR:

DATE OF COLLECTION:

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: VOA 601/8010	VOA 602/8020	MTBE	Methane	TPH 418.1	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (Sig # 4)	PNA 610/8100	PEST/PCBS 8080	Oxygen	Nitrogen	Carbon Dioxide	FIELD NOTES	Total No. of Containers	Laboratory Note No.
B-18	H2O	0755	water	2 VOA	X															
LF04-04	H2O	0950	water	2 VOA	X															
LF04-4G	H2O	1000	water	2 VOA	X															
LF05-5G	H2O	1015	water	2 VOA	X															
LF05-5B	H2O	1050	water	2 VOA	X															
WP07-10C	H2O	1105	water	2 VOA	X															
SHHFW	H2O	1110	water	2 VOA	X															
WP07-10B	H2O	1115	water	2 VOA	X															
LF04-4F	H2O	1130	water	2 VOA	X															
B-21	18-18.5	1553	SOIL	ACETATE	X															
LF04-10	H2O	1700	water	2 VOA	X															
EBGn29A	H2O	1600	Water	1 VOA	X															

RELINQUISHED BY (Signature): Robert Wallace DATE/TIME: 7/29/98 RECEIVED BY (SIGNATURE): [illegible] DATE/TIME: 7/29/98

RELINQUISHED BY (Signature) DATE/TIME RECEIVED BY (SIGNATURE) DATE/TIME

SAMPLE RECEIPT	
Total No. of Containers	
Seals Intact? Y/N/NA	
Received Good Cond./Cold	
Notes:	

Laboratory Notes:
1 SOIL
11 H_2O

SAMPLE DISPOSAL INSTRUCTIONS

☐ DISPOSAL/$2.00@ ☐ RETURN ☐ PICKUP

MMP 11/95

Transglobal Environmental Geochemistry
CHAIN-OF-CUSTODY RECORD

P.O.# _____

CLIENT: HydroGeoLogic Inc.

DATE: 7-30-98 PAGE 1 OF 1

ADDRESS: 1155 Herndon Parkway, Suite 900, Herndon VA 20170

TEG PROJECT #: T1980722

PHONE: 703-478-5186 FAX: 703-471-4180

LOCATION: NAS FT WORTH JRB

CLIENT PROJECT #: AFC001-18bb

PROJECT MANAGER: Robert T. Wallace, Jr P.G.

COLLECTOR:

DATE OF COLLECTION:

Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020	MTBE	Methane	TPH 418.1	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (g & d)	PNA 610/8100	PEST/PCBs 8080	Oxygen	Nitrogen	Carbon Dioxide	FIELD NOTES	Total No. of Containers	Laboratory Note No.
B-21	H_2O	0800	Water	2 VOA	X															
Spring 6	H_2O	0835	water	2 VOA																
FBC-3	H_2O	0850	water	2 VOA																
WHGLTA002	H_2O	0950	water	2 VOA																
POND231	H_2O	1005	water	2 VOA																
LF04-4B	H_2O	1150	water	2 VOA																
LF04-4A	H_2O	1200	water	2 VOA																
LF04-4C	H_2O	1215	water	2 VOA																
LF04-4D	H_2O	1222	water	2 VOA																
LF04-4E	H_2O	1320	water	2 VOA																
LF04-02	H_2O	1330	water	2 VOA																
CAR-RW7	H_2O	1345	water	2 VOA																
GMI04-01	H_2O	1400	water	2 VOA																
Spring 7	H_2O	1500	water	2 VOA																
USGSTA018	H_2O	1650	water	2 VOA																
USGSTA004	H_2O	1710	water	2 VOA																
WHGLTA601	H_2O	1730	water	2 VOA																

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (SIGNATURE)	DATE/TIME
[signature]	1750	[signature]	
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (SIGNATURE)	DATE/TIME

SAMPLE RECEIPT

Total No. of Containers	
Seals Intact? Y/N/NA	
Received Good Cond./Cold	
Notes:	

Laboratory Notes:

17 H_2O

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL/$2.00@ ☐ RETURN ☐ PICKUP

MMP 11/95

524 1153

524 154

Transglobal Environmental Geochemistry
CHAIN-OF-CUSTODY RECORD

P.O.# _____

CLIENT: HYDROGEOLOGIC

DATE: 7/31/98 PAGE 1 OF 2

ADDRESS:

TEG PROJECT #: T1980722

PHONE: FAX:

LOCATION: NAS FT WORTH JRB

CLIENT PROJECT #: PROJECT MANAGER:

COLLECTOR: DATE OF COLLECTION:

Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020	MTBE	Methane	TPH 418.1	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (lig & di)	PNA 610/8100	PEST/PCBs 8080	Oxygen	Nitrogen	Carbon Dioxide	FIELD NOTES	Total No. of Containers	Laboratory Note No.
FT09-12C	H_2O	1040	Water	2VOA	X															
FT09-12E	H_2O	1045	Water	2VOA																
FT09-12D	H_2O	1100	Water	2VOA																
USGSTA019	H_2O	1245	Water	2VOA																
WJEGTA527	H_2O	1300	water	2VOA																
WJEGTA528	H_2O	1310	water	2VOA																
Spring 8	H_2O	1315	water	2VOA																
CANS, TRIPPY	H_2O	1418	WASTE	PLASTIC																
WUSGSTA007	H_2O	1450	water	2VOA																
WUSGSTA012	H_2O	1500	water	2VOA																
WUSGSTA001	H_2O	1515	water	2VOA																
WJEGTA521	H_2O	1525	water	2VOA																
WJEGTA526	H_2O	1530	water	2VOA																
WUSGSTA010	H_2O	1540	water	2VOA																
WUSGSTA008	H_2O	1545	water	2VOA																
WUSGSTA016	H_2O	1600	water	2VOA																
HMS East	H_2O	1635	water	2VOA																

RELINQUISHED BY (Signature) DATE/TIME RECEIVED BY (SIGNATURE) DATE/TIME 7/31/98

RELINQUISHED BY (Signature) DATE/TIME RECEIVED BY (SIGNATURE) DATE/TIME

SAMPLE RECEIPT	
Total No. of Containers	
Seals Intact? Y/N/NA	
Received Good Cond./Cold	
Notes:	

Laboratory Notes: 17 H_2O

SAMPLE DISPOSAL INSTRUCTIONS

[ ] TEG DISPOSAL/$2.00@ [ ] RETURN [ ] PICKUP

MMP 11/95

Transglobal Environmental Geochemistry
CHAIN-OF-CUSTODY RECORD

P.O.# _____

CLIENT: HYDROGEOLOGIC

DATE: 7/31/98 PAGE 2 OF 2

ADDRESS:

TEG PROJECT #: T1980722

PHONE: FAX:

LOCATION: NAS FT WORTH JRB

CLIENT PROJECT #: PROJECT MANAGER:

COLLECTOR: DATE OF COLLECTION:

Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020	MTBE	Methane	TPH 418.1	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 g & d	PNA 610/8100	PEST/PCBs 8080	Oxygen	Nitrogen	Carbon Dioxide	FIELD NOTES	Total No. of Containers	Laboratory Note No.
HMS Midway	H_2O	1640	water	2 VOA																
AMS West	H_2O	1650	water	2 VOA																
WHGLTA203	H_2O	1705	water	2 VOA																
WHGLTA604	H_2O	1710	water	2 VOA																
WHGLTA204	H_2O	1730	water	2 VOA																
~~WHGLTA~~ EB2-T	H_2O	1735	water	2 VOA																
B-23	H_2O	1800	water	2 VOA																

RELINQUISHED BY (Signature) DATE/TIME 1430 8/1/98 RECEIVED BY (SIGNATURE) DATE/TIME 7/31/98

RELINQUISHED BY (Signature) DATE/TIME RECEIVED BY (SIGNATURE) DATE/TIME

SAMPLE RECEIPT

Total No. of Containers	
Seals Intact? Y/N/NA	
Received Good Cond./Cold	
Notes:	

Laboratory Notes: 7 H_2O

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL/$2.00@ ☐ RETURN ☐ PICKUP

MMP 11/95

524 155

524 156

Transglobal Environmental Geochemistry
CHAIN-OF-CUSTODY RECORD

teg

P.O.# _____

CLIENT: Hydrogeologic Inc.

DATE: 8/1/98

PAGE 1 OF 1

ADDRESS: 1155 Herndon Parkway Suite 900 Herndon VA 20170

TEG PROJECT #: T198072-2

PHONE: 703-478-5186

FAX: 703-471-4180

LOCATION: NAS FW JRB

CLIENT PROJECT #: AFC001-18BB

PROJECT MANAGER: Bob Wallace

COLLECTOR:

DATE OF COLLECTION:

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: VOA 601/8010	VOA 602/8020	MTBE	Methane	TPH 418.1	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (sig # c)	PNA 610/8100	PEST/PCBs 8080	Oxygen	Nitrogen	Carbon Dioxide	FIELD NOTES	Total No. of Containers	Laboratory Note No.
B-24		1420	W	40ml/G	X															
B-25		1410	W	40ml/G	X															
B-26		1355	W	40ml/G	X															

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (SIGNATURE)	DATE/TIME
[signature]	8/1/98 1433	[signature]	8/1/98
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (SIGNATURE)	DATE/TIME

SAMPLE RECEIPT	
Total No. of Containers	
Seals Intact? Y/N/NA	
Received Good Cond./Cold	
Notes:	

Laboratory Notes:
3 H_2O

SAMPLE DISPOSAL INSTRUCTIONS

☐ DISPOSAL/$2.00@ ☐ RETURN ☐ PICKUP

MMP 11/95

REC. LabNet Use Only

Custody Transfer Record/Lab Work Request

CRA LabNet

Client: HydroGeologic Inc
Est. Final Proj. Sampling Date: July 31, 1997
Project #: AFC 001 18BB
Project Contact/Phone #: Jim Castello
RECRA Project Manager: Chuck Mayo
QC: Del: TAT:
Date Rec'd: Date Due:
Account #:

Refrigerator #
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives

ANALYSES REQUESTED → ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	RECRA LabNet Use Only												
	1-TMW-01T-18BB			W	7-26-98	1330	3												
	EB072698			W	7-26-98	1230	3												
	B6			W	7-27-98	1510	3												
	B12			W	7-27-98	1625	3												
	B12			S	7-27-98	1625	1												
	B15			S	7-27-98	1640	1												
	TB072798A			W	7-27-98	1800	3												

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
VOC get 8021

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

RECRA LabNet Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # ___
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Discrepancies Between Samples Lables and COC Record? Y or N
NOTES:

Relinquished by	Received by	Date	Time
[illegible]		7-27-98	630P

Relinquished by	Received by	Date	Time

524 157

RECRA LabNet Use Only

Custody Transfer Record/Lab Work Request

RECRA LabNet

524 158

Client: HydroGeologic Inc
Est. Final Proj. Sampling Date: 7-31-98
Project #: AF-C 001 18BB
Project Contact/Phone #: J. M. Castello
RECRA Project Manager: Chuck Mow
QC: Del TAT
Date Rec'd: Date Due:
Account #:

Refrigerator #
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives

ANALYSES REQUESTED → ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN

RECRA LabNet Use Only

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb	Metal	CN
	LF04-10-18BB			W	7-29-98	1900	3					
	FB07299 8-A			W	7-29-98	1600	2					

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
Analysis = 8021

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
Patsy Dunda		7-29-98	1836

Relinquished by	Received by	Date	Time

Discrepancies Between Samples Lables and COC Record? Y or N
NOTES:

RECRA LabNet Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # ___
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

TAB

Appendix B

APPENDIX B
JULY 1998 SCREENING INVESTIGATION
MOBILE LABORATORY RESULTS

teg

August 5, 1998

Mr. Bob Wallace
HYDROGEOLOGIC, Inc.
1155 Herndon Parkway, Suite 900
Herndon, Virginia 20170

RE: **SOIL & WATER SAMPLES – TCE INVESTIGATION – NAS FORT WORTH JRB, FORT WORTH, TX. – PROJECT #AFC001-18**

TEG-Texas project #T1-980722

Mr. Wallace:

Please find enclosed the hard copy data report for the soil & water samples from the NAS Forth Worth JRB site in Fort Worth, TX for HYDROGEOLOGIC, Inc. All samples were analyzed in TEG-Texas' mobile environmental laboratory for the following:

- 21 soil samples for Volatile Halogenated Hydrocarbons (EPA Method 8021).
- 80 water samples and 4 equipment blanks for Volatile Halogenated Hydrocarbons (EPA Method 8021).

You will also find enclosed appropriate QA/QC data, Chain of Custody Records, and Project Narrative. Also enclosed is an IBM formatted computer disk containing an exact electronic copy of the spreadsheets.

TEG-Texas appreciates the opportunity to work with HYDROGEOLOGIC, Inc. on this project. If you have any questions regarding these data or need further information, please do not hesitate to call (830) 420-3516.

Sincerely,

Julie A. Pieper

Julie A. Pieper
General Manager

Transglobal Environmental Geochemistry ★ Texas
306 Sea Willow Drive • Marion, TX 78124-6518
Phone: 830-420-3516 Fax: 830-420-3603

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Narrative

Date	Comments
7/23/98	Arrived site 6:00 am, ran 5-point curve, QC, LCS, Blank. First sample 10:00 am, Last sample 16:48, left site 18:00 after qa/qc.
7/24/98	Arrived site 6:30 am. Ran QC., LCS, Blank, MS/MSD before lunch, no samples. No samples by 16:00, Bob Wallace shut down until tomorrow. We will work the weekend per Bob Wallace.
7/25/98	Arrived site 7:00 am. Ran QC, LCS, Blank. Ran samples until 16:00, saved B-7 till morning. Left site 17:15 after QA/QC.
7/26/98	Arrived site 7:00 am. Ran QC, LCS, Blank. Ran samples until 14:15, ran QC, left site at 16:30.
7/27/98	Arrived site 7:00 am. Ran QC, LCS, Blank. Ran samples until 17:00, ran QC, left site at 18:00.
7/28/98	Arrived site 6:45 am. Ran QC, LCS, Blank. Re-ran B-16 24-24.5 because sparge vessel cracked during run. Last sample run at 17:30, ran QC. Left site at 1830
7/29/98	Arrived site 6:50, ran QC, LCS, Blank. Bob collected well samples to keep me busy. Many samples required dilution due to high levels of TCE and 1,2 cis DCE In some cases, high TCE levels interfered with the TFT surrogate. Dilution solved this problem. Suspected that TCE in SHHFW may be carry-over, ran dup. Left site at 19:00.
7/30/98	Arrived site 6:50, ran QC, LCS, Blank. Bob collected well samples again to keep me busy. Dilutions again required. Left site at 18:30.
7/31/98	Arrived site 6:30 am. Ran QC., LCS, Blank. Ran remaining samples from yesterday. First samples arrived at 11:00. Dilutions again required. Lots of samples today. Left site at 19:30.
8/1/98	Arrived site 7:00 am. Ran QC, LCS, Blank. Left site at 17:00.

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USEPA Method 8021 Analyses of Water

Sample ID	Spring-1	Spring-2	Spring-3	Spring-4	Spring-4 (duplicate)	Spring-5	Spring-6	Spring-7
Time Analyzed	11:15	14:34	9:19	9:50	11:14	10:14	11:03	15:35
Date Analyzed	7/23/98	7/25/98	7/27/98	7/27/98	7/27/98	7/27/98	7/30/98	7/30/98
Dilution	0	0	0	0	0	0	0	0
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND
Trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	ND	1.3(F)	ND	2.4	2.4	ND	ND	14.6
Trichloroethene	ND	2.1	ND	1.9(F)	1.9(F)	ND	ND	ND
% TFT Surrogate Recovery	95	105	95	95	97	100	94	87

"ND" indicates "Not Detected" at the reporting limit of 2μg/L for each 8021 analyte.
Qualifiers: "F" - value between MDL and RL, "E" - value oustide calibrated range, "D" - value reported from diluted sample.
"int." indicates that high TCE levels interfered with the surrogate recovery.

Analyses performed on site in TEG's mobile environmental laboratory.

Analyses performed by:R. Scott Pieper

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USEPA Method 8021 Analyses of Water

Sample ID	Spring-8	FBC-1	FBC-1 (duplicate)	FBC-2	FBC-3	KBC-1	KBC-2	KBC-3
Time Analyzed	13:47	13:18	16:07	14:09	10:38	14:58	15:21	16:26
Date Analyzed	7/31/98	7/25/98	7/25/98	7/25/98	7/30/98	7/25/98	7/25/98	7/28/98
Dilution	0	0	0	0	0	0	0	0
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND
Trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	ND	6.5	6.2	ND	1.2(F)	ND	ND	ND
Trichloroethene	ND	30.0	29.5	ND	3.4	ND	ND	ND
% TFT Surrogate Recovery	106	102	101	111	95	104	109	90

"ND" indicates "Not Detected" at the reporting limit of 2μg/L for each 8021 analyte.
Qualifiers: "F" - value between MDL and RL, "E" - value oustide calibrated range, "D" - value reported from diluted sample.
"int." indicates that high TCE levels interfered with the surrogate recovery.

Analyses performed on site in TEG's mobile environmental laboratory.

Analyses performed by:R. Scott Pieper

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TEG Project #T1980722

USEPA Method 8021 Analyses of Water

Sample ID	FBKB-1	Pond-1	Pond-231	SHHFW	SHHFW (duplicate)	MW-IT-01T	MW-IT-01T (Low purge)	MW-IT-01T (duplicate)
Time Analyzed	15:44	13:44	11:26	15:01	17:09	14:53	14:31	15:00
Date Analyzed	7/25/98	7/26/98	7/30/98	7/29/98	7/29/98	7/23/98	7/26/98	7/26/98
Dilution	0	0	0	0	0	0	0	0
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND
Trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	1.5(F)	1.3(F)	1.3(F)
Cis-1,2-Dichloroethene	ND	ND	1.2(F)	ND	ND	5.7	6.6	6.7
Trichloroethene	ND	ND	2.5	1.8(F)	ND	11.3	13.4	13.7
% TFT Surrogate Recovery	104	99	91	107	100	93	96	95

"ND" indicates "Not Detected" at the reporting limit of 2µg/L for each 8021 analyte.
Qualifiers: "F" - value between MDL and RL, "E" - value oustide calibrated range, "D" - value reported from diluted sample.
"int." indicates that high TCE levels interfered with the surrogate recovery.

Analyses performed on site in TEG's mobile environmental laboratory.

Analyses performed by:R. Scott Pieper

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Fort Worth, Texas

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TEG Project #T1980722

USEPA Method 8021 Analyses of Water

Sample ID	WHGLTA002	WHGLTA003	WHGLTA203	WHGLTA204	WHGLTA601	WGHLTA604	LF04-02	LF04-02 (duplicate)
Time Analyzed	11:49	15:25	11:22	10:37	9:16	10:59	17:22	17:47
Date Analyzed	7/30/98	7/27/98	8/1/98	8/1/98	7/31/98	8/1/98	7/30/98	7/30/98
Dilution	0	0	0	0	0	0	0	10/1
Vinyl Chloride	ND	ND	ND	ND	ND	ND	5.2	3.7(D)
Trans-1,2-Dichloroethene	ND	ND	1.1(F)	ND	1.5(F)	ND	17.0	15.7(D)
Cis-1,2-Dichloroethene	1.9(F)	19.7	4.1	3.2	29.7	18.2	388	342(D)
Trichloroethene	1.6(F)	61.4	1.2(F)	26.3	126	105	833(E)	2210(D)
% TFT Surrogate Recovery	90	102	97	92	92	103	int.	100

"ND" indicates "Not Detected" at the reporting limit of 2μg/L for each 8021 analyte.
Qualifiers: "F" - value between MDL and RL, "E" - value oustide calibrated range, "D" - value reported from diluted sample.
"int." indicates that high TCE levels interfered with the surrogate recovery.

Analyses performed on site in TEG's mobile environmental laboratory.

Analyses performed by:R. Scott Pieper

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USEPA Method 8021 Analyses of Water

Sample ID	LF04-04	LF04-4A	LFO4-4B	LF04-4C	LF04-4D	LF04-4D (duplicate)	LF04-4E	LF04-4E (duplicate)
Time Analyzed	10:46	13:06	13:54	14:17	14:39	15:06	15:57	16:49
Date Analyzed	7/29/98	7/30/98	7/30/98	7/30/98	7/30/98	7/30/98	7/30/98	7/30/98
Dilution	0	0	0	0	0	10/1	0	10/1
Vinyl Chloride	ND	ND	ND	ND	5.9	3.6(D)	4.8	3.1(D)
Trans-1,2-Dichloroethene	2.5	ND	ND	1.1(F)	2.7	2.9(D)	11.4	11.0(D)
Cis-1,2-Dichloroethene	52.1	ND	ND	4.0	88.8	78.7(D)	362	304(D)
Trichloroethene	103	ND	ND	6.2	231	194(D)	696(E)	1140(D)
% TFT Surrogate Recovery	110	90	92	89	108	90	int.	99

"ND" indicates "Not Detected" at the reporting limit of 2μg/L for each 8021 analyte.
Qualifiers: "F" - value between MDL and RL, "E" - value oustide calibrated range, "D" - value reported from diluted sample.
"int." indicates that high TCE levels interfered with the surrogate recovery.

Analyses performed on site in TEG's mobile environmental laboratory.

Analyses performed by:R. Scott Pieper

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Sample ID	LF04-4F	LF04-4F (duplicate)	LF04-4G	LF04-4G (duplicate)	LF04-10	LF04-10	LF05-18	LF05-18 (duplicate)
Time Analyzed	16:13	16:39	11:10	11:37	16:32	17:36	13:05	13:45
Date Analyzed	7/29/98	7/29/98	7/29/98	7/29/98	7/27/98	7/29/98	7/28/98	7/28/98
Dilution	0	10/1	0	10/1	0	0	0	10/1
Vinyl Chloride	5.7	6.8(D)	ND	ND(D)	ND	ND	21.2	26.5(D)
Trans-1,2-Dichloroethene	22.9	21.6(D)	3.0	2.9(D)	ND	ND	41.0	41.5(D)
Cis-1,2-Dichloroethene	452	437(D)	82.7	65.8(D)	ND	ND	214	214(D)
Trichloroethene	746(E)	1290(D)	450(E)	515(D)	ND	ND	447	459(D)
% TFT Surrogate Recovery	int.	109	121	106	100	100	124	99

"ND" indicates "Not Detected" at the reporting limit of 2µg/L for each 8021 analyte.
Qualifiers: "F" - value between MDL and RL, "E" - value oustide calibrated range, "D" - value reported from diluted sample.
"int." indicates that high TCE levels interfered with the surrogate recovery.

Analyses performed on site in TEG's mobile environmental laboratory.

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USEPA Method 8021 Analyses of Water

Sample ID	LF05-19	LF05-5G	LF05-5G (duplicate)	LF05-5B	WP07-10C	WP07-10B	WP07-10B (duplicate)	WUSGSTA001
Time Analyzed	15:26	12:01	12:31	12:56	14:34	15:24	15:49	9:50
Date Analyzed	7/28/98	7/29/98	7/29/98	7/29/98	7/29/98	7/29/98	7/29/98	8/1/98
Dilution	0	0	10/1	0	0	0	10/1	0
Vinyl Chloride	ND	16.2	18.7(D)	83.8	32.9	7.8	6.9(D)	ND
Trans-1,2-Dichloroethene	ND	20.2	19.9(D)	7.5	7.5	29.4	29.0(D)	ND
Cis-1,2-Dichloroethene	4.0	192	228(D)	439	75.3	384	370(D)	80.6
Trichloroethene	14.6	544(E)	877(D)	ND	147	799(E)	1950(D)	262
% TFT Surrogate Recovery	95	119	105	97	108	int.	118	122

"ND" indicates "Not Detected" at the reporting limit of 2μg/L for each 8021 analyte.
Qualifiers: "F" - value between MDL and RL, "E" - value oustide calibrated range, "D" - value reported from diluted sample.
"int." indicates that high TCE levels interfered with the surrogate recovery.

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Analyses performed by:R. Scott Pieper

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USEPA Method 8021 Analyses of Water

Sample ID	WUSGSTA004	WUSGSTA007	WUSGSTA008	WUSGSTA010	WUSGSTA010 (duplicate)	WUSGSTA012	WUSGSTA016	WUSGSTA016 (duplicate)
Time Analyzed	8:50	17:58	17:33	18:21	18:47	14:02	16:45	17:09
Date Analyzed	7/31/98	7/31/98	7/31/98	7/31/98	7/31/98	8/1/98	7/31/98	7/31/98
Dilution	0	0	0	0	10/1	0	0	10/1
Vinyl Chloride	ND	ND	ND	3.1	ND(D)	ND	ND	ND(D)
Trans-1,2-Dichloroethene	ND	6.9	ND	2.9	3.5(D)	ND	ND	ND(D)
Cis-1,2-Dichloroethene	37.0	18.3	3.5	102	103(D)	59.1	122	110(D)
Trichloroethene	172	17.5	16.3	303	301(D)	320	398	391(D)
% TFT Surrogate Recovery	105	102	100	int.	99	116	int.	103

"ND" indicates "Not Detected" at the reporting limit of 2µg/L for each 8021 analyte.
Qualifiers: "F" - value between MDL and RL, "E" - value oustide calibrated range, "D" - value reported from diluted sample.
"int." indicates that high TCE levels interfered with the surrogate recovery.

Analyses performed on site in TEG's mobile environmental laboratory.

Analyses performed by:R. Scott Pieper

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USEPA Method 8021 Analyses of Water

Sample ID	WUSGSTA018	WUSGSTA019	WUSGSTA019 (duplicate)	GMI04-01	GM04-01 (duplicate)	CAR RW-7	CAR RW-7 (duplicate)	FT09-12C
Time Analyzed	8:24	15:30	15:56	9:42	10:08	10:30	11:01	11:36
Date Analyzed	7/31/98	7/31/98	7/31/98	7/31/98	7/31/98	7/31/98	7/31/98	7/31/98
Dilution	0	0	10/1	0	10/1	0	10/1	0
Vinyl Chloride	ND	ND	ND(D)	ND	ND(D)	ND	ND(D)	5.4
Trans-1,2-Dichloroethene	2.4	ND	ND(D)	108	149(D)	8.2	8.1(D)	ND
Cis-1,2-Dichloroethene	40.1	48.0	43.2(D)	163	197(D)	141	130(D)	29.2
Trichloroethene	136	305	256(D)	331	308(D)	741(E)	1270(D)	1.7(F)
% TFT Surrogate Recovery	96	119	106	104	75	int.	99	82

"ND" indicates "Not Detected" at the reporting limit of 2µg/L for each 8021 analyte.
Qualifiers: "F" - value between MDL and RL, "E" - value oustide calibrated range, "D" - value reported from diluted sample.
"int." indicates that high TCE levels interfered with the surrogate recovery.

Analyses performed on site in TEG's mobile environmental laboratory.

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USEPA Method 8021 Analyses of Water

Sample ID	FT09-12D	FT09-12E	WJEGTA526	WJEGTA527	WJEGTA527 (duplicate)	WJEGTA528	WJEGTA529	Cars. Treat.
Time Analyzed	12:49	13:15	9:03	14:41	15:06	14:15	9:27	16:20
Date Analyzed	7/31/98	7/31/98	8/1/98	7/31/98	7/31/98	7/31/98	8/1/98	7/31/98
Dilution	0	0	0	0	10/1	0	0	0
Vinyl Chloride	ND	ND	ND	ND	ND(D)	ND	ND	ND
Trans-1,2-Dichloroethene	ND	ND	ND	ND	ND(D)	ND	ND	ND
Cis-1,2-Dichloroethene	4.2	ND	46.1	56.0	50.1(D)	32.6	48.9	6.5
Trichloroethene	10.8	ND	252	313	293(D)	196	285	18.2
% TFT Surrogate Recovery	97	103	119	119	106	110	123	101

"ND" indicates "Not Detected" at the reporting limit of 2µg/L for each 8021 analyte.
Qualifiers: "F" - value between MDL and RL, "E" - value oustide calibrated range, "D" - value reported from diluted sample.
"int." indicates that high TCE levels interfered with the surrogate recovery.

Analyses performed on site in TEG's mobile environmental laboratory.

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TEG Project #T1980722

USEPA Method 8021 Analyses of Water

Sample ID	HMS West	HMS Midway	HMS East	B-1	B-1 (duplicate)	B-2	B-6	B-7
Time Analyzed	11:44	12:07	13:41	13:57	15:21	9:05	12:32	8:30
Date Analyzed	8/1/98	8/1/98	8/1/98	7/23/98	7/23/98	7/24/98	7/25/98	7/26/98
Dilution	0	0	0	0	0	0	0	0
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND
Trans-1,2-Dichloroethene	ND	ND	ND	1.4(F)	1.5(F)	ND	ND	ND
Cis-1,2-Dichloroethene	ND	ND	ND	7.0	7.2	ND	6.6	ND
Trichloroethene	ND	ND	ND	15.1	15.6	ND	14.7	ND
% TFT Surrogate Recovery	99	99	98	90	90	103	100	103

"ND" indicates "Not Detected" at the reporting limit of 2µg/L for each 8021 analyte.
Qualifiers: "F" - value between MDL and RL, "E" - value oustide calibrated range, "D" - value reported from diluted sample.
"int." indicates that high TCE levels interfered with the surrogate recovery.

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USEPA Method 8021 Analyses of Water

Sample ID	B-9	B-11	B-12	B-15	B-15 (duplicate)	B-16	B-18	B-18 (duplicate)
Time Analyzed	9:43	13:19	13:12	10:45	11:41	8:23	8:46	10:00
Date Analyzed	7/26/98	7/26/98	7/27/98	7/28/98	7/28/98	7/29/98	7/29/98	7/29/98
Dilution	0	0	0	0	0	0	0	0
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND
Trans-1,2-Dichloroethene	ND	ND	2.2	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	ND	ND	5.3	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	4.7	ND	ND	ND	ND	ND
% TFT Surrogate Recovery	103	101	97	89	97	112	110	104

"ND" indicates "Not Detected" at the reporting limit of 2μg/L for each 8021 analyte.
Qualifiers: "F" - value between MDL and RL, "E" - value oustide calibrated range, "D" - value reported from diluted sample.
"int." indicates that high TCE levels interfered with the surrogate recovery.

Analyses performed on site in TEG's mobile environmental laboratory.

Analyses performed by:R. Scott Pieper

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TEG Project #T1980722

USEPA Method 8021 Analyses of Water

Sample ID	B-21	B-21 (duplicate)	B-23	B-23 (duplicate)	B-24	B-25	B-26
Time Analyzed	8:54	9:23	8:41	14:27	14:52	15:16	15:38
Date Analyzed	7/30/98	7/30/98	8/1/98	8/1/98	8/1/98	8/1/98	8/1/98
Dilution	0	0	0	0	0	0	0
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND
Trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	1.8(F)	1.8(F)	3.1	3.2	ND	24.2	35.8
Trichloroethene	4.6	4.8	7.4	7.9	4.9	102	184
% TFT Surrogate Recovery	89	92	101	96	97	105	112

"ND" indicates "Not Detected" at the reporting limit of 2µg/L for each 8021 analyte.
Qualifiers: "F" - value between MDL and RL, "E" - value oustide calibrated range, "D" - value reported from diluted sample.
"int." indicates that high TCE levels interfered with the surrogate recovery.

Analyses performed on site in TEG's mobile environmental laboratory.

Analyses performed by:R. Scott Pieper

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TEG Project #T1980722

USEPA Method 8021 Analyses of Soil

Sample ID	B-1	B-1	B-2	B-2	B-6	B-6	B-7	B-7	B-9	B-9
Depth (ft)	19.5-20	21.5-22	11-11.5	13.5-14	16-16.5	19.5-20	15-15.5	18.5-19	16-16.5	18-18.5
Time Analyzed	12:09	12:36	15:58	16:26	11:42	12:08	8:54	9:17	12:02	10:10
Date Analyzed	7/23/98	7/23/98	7/23/98	7/23/98	7/25/98	7/25/98	7/26/98	7/26/98	7/26/98	7/26/98
Dilution	0	0	0	0	0	0	0	0	0	0
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
% TFT Surrogate Recovery	95	78	79	88	102	74	98	80	95	81

"ND" indicates "Not Detected" at 2μg/Kg for each 8021 analyte.

Analyses performed on site in TEG's mobile environmental laboratory.

Analyses performed by:R. Scott Pieper

HYDROLOGIC
Project #AFC001-18
TCE Investigation
NAS Fort Worth JRB
Fort Worth, Texas

TEG Project #T1980722

USEPA Method 8021 Analyses of Soil

Sample ID	B-9	B-9	B-11	B-12	B-15	B-15	B-16	B-16	B-16 (duplicate)	B-18
Depth (ft)	19.5-20	21.5-22	14.5-15	10.5-11	21-21.5	27-27.5	21-21.5	24-24.5	24-24.5	27-27.5
Time Analyzed	10:40	11:04	12:29	10:44	8:40	9:16	9:58	10:23	11:17	9:10
Date Analyzed	7/26/98	7/26/98	7/26/98	7/27/98	7/28/98	7/28/98	7/28/98	7/28/98	7/28/98	7/29/98
Dilution	0	0	0	0	0	0	0	0	0	0
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
% TFT Surrogate Recovery	85	103	101	100	91	95	94	12	91	99

"ND" indicates "Not Detected" at 2µg/Kg for each 8021 analyte.

Analyses performed on site in TEG's mobile environmental laboratory.

Analyses performed by:R. Scott Pieper

HYDROGEOLOGIC
Project #AFC001-18
TCE Investigation
NAS Fort Worth JRB
Fort Worth, Texas

524 178

TEG Project #T1980722

USEPA Method 8021 Analyses of Soil

Sample ID	B-18	B-21
Depth (ft)	30-30.5	18-18.5
Time Analyzed	9:35	8:31
Date Analyzed	7/29/98	7/30/98
Dilution	0	0
Vinyl Chloride	ND	ND
Trans-1,2-Dichloroethene	ND	ND
Cis-1,2-Dichloroethene	ND	ND
Trichloroethene	ND	ND
% TFT Surrogate Recovery	103	93

"ND" indicates "Not Detected" at 2μg/Kg for each 8021 analyte.

Analyses performed on site in TEG's mobile environmental laboratory.

Analyses performed by:R. Scott Pieper

TAB

Appendix C

APPENDIX C.1
1999 SOUTHERN LOBE TCE PLUME DELINEATION
BORING LOGS

HydroGeoLogic INC.

Project No: AFC001-019CCA

Borehole ID: WHGLRW015

Project: Focused Feasibility Study

Date: 6/22/99

Client: AFCEE

Geologist: B Nielsen

Location:

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
1 2 3 4 5		***Silty Clay*** 10YR 4/4 dk yellowish brown silty clay, high plasticity, stiff, damp, well sorted	-5	CL	90%	Damp	0.0	Grassy topsoil Trace of calcareous nodules
6 7 8 9 10		***Clayey Silt*** 10YR 6/6 brownish yellow clayey silt w/calcareous nodules and deposits, moderate plasticity, firm, damp, well sorted	-10	ML	60%	Damp	0.0	
11 12 13 14 15		***Clayey Silt*** 7.5YR 5/8 strong brown clayey silt, moderate plasticity, firm to stiff, damp to moist, well sorted, some calareous nodules	-15	ML	70%	Damp Moist	0.0	50% mottled w/some root material in gray areas
16								

Drilled By: Environmental Drilling

Drill Method: HSA

Drilling Equipment: CME 75

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 8.25"

Total Depth Drilled: 24'

Sheet: 1 of 2

524 182

Project No: AFC001-019CCA

Borehole ID: WHGLRW015

Project: Focused Feasibility Study

Date: 6/22/99

Client: AFCEE

Geologist: B Nielsen

Location:

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
17								Saturated at 17'
				GM				
18		***Sandy Silty Gravel*** 10YR 6/8 brownish yellow sandy silty gravel, loose, saturated, poorly sorted				Wet	0.0	
19								
20			-20					
21								
22		***Sandy Silty Gravel*** 10YR 6/8 brownish yellow sandy silty gravel, loose, saturated, poorly sorted		GM		Wet	0.0	
23								
24			-24					Bedrock at 24' is hard shaley clay
25								
26								
27								
28								
29								
30								
31								
32								

Drilled By: Environmental Drilling

Drill Method: HSA

Drilling Equipment: CME 75

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 8.25"

Total Depth Drilled: 24'

Sheet: 2 of 2

HYDRO GeoLogic INC.

Project No: AFC001-019CCA

Borehole ID: WHGLRW016

Project: Focused Feasibility Study

Date: 8/17/99

Client: AFCEE

Geologist: B Nielsen

Location: Rt 183 and Roaring Springs Rd

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
1, 2, 3, 4		***Gravelly Clayey Silt*** 10YR 5/3 brown gravelly clayey silt, low plasticity, poorly sorted, dry	-4	ML	10%	Dry	0.0	Gravel is 5-10%
5, 6		***Gravelly Clay*** 10YR 3/2 v dk grayish brown gravelly clay, moderate plasticity, firm, damp, poorly sorted	-6	CL	100%	Damp	0.0	
7, 8		***No Recovery***	-8	NA	0%	NA	NA	
9, 10		***Silty Clay*** 10YR 3/1 v dk gray silty clay w/a trace of gravel, high plasticity, well sorted, moist, firm to stiff	-10	CL	100%	Moist	0.0	Gravel is <5% Orange mottling (iron staining)
11, 12		***Sandy Silty Clay*** 10YR 4/3 brown sandy silty clay w/a trace of gravel, high plasticity, firm to stiff, poorly sorted, moist	-12	CL	100%	Moist	0.0	Gravel is <5%
13, 14		***Silty Clay with Sand and Gravel*** 10YR 7/6 yellow silty clay w/some sand and gravel, high plasticity, moderately sorted, moist	-14	CL		Moist	0.0	White calcareous deposits
15, 16		***Gravelly Sandy Silt*** 10YR 6/6 brownish yellow gravelly sandy silt, firm to soft, low plasticity, poorly sorted, moist to wet	-16	ML	100%	Moist Wet	0.0	Wet at 15' (capillary fringe) Gravel is 10-15% Hit water at 16'

Drilled By: Geoprojects International

Drill Method: HSA

Drilling Equipment: CME 75

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 6.25"

Total Depth Drilled: 23.7'

Sheet: 1 of 2

HydroGeoLogic INC.

Project No: AFC001-019CCA **Borehole ID: WHGLRW016**

Project: Focused Feasibility Study

Date: 8/17/99

Client: AFCEE

Geologist: B Nielsen

Location: Rt 183 and Roaring Springs Rd

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
17		***Silty Sandy Gravel*** 10YR 5/6 yellowish brown silty sandy gravel, loose to soft, low to no plasticity, v poorly sorted, saturated	-18	GM	100%	Wet	0.0	Gravel is med to large limestone, subangular
18								
19		***Sandy Gravel with Silt*** 10YR 5/6 yellowish brown sandy gravel with silt, loose, saturated, poorly sorted	-20	GM		Wet	0.0	Gravel is large to small, subangular limestone and chert
20								
21		***Silty Gravel with Sand*** 10YR 5/6 yellowish brown silty gravel with sand, loose, saturated, poorly sorted to moderately sorted	-22	GM	100%	Wet	0.0	Gravel is large to small limestone and chert, rounded to subangular
22								
23		***Clayey Shale*** 10YR 7/1 light gray clayey shale, hard, dry, well sorted	-23.7			Dry	0.0	Bedrock
24								
25								
26								
27								
28								
29								
30								
31								
32								

Drilled By: Geoprojects International

Drill Method: HSA

Drilling Equipment: CME 75

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 6.25"

Total Depth Drilled: 23.7'

Sheet: 2 of 2

HYDRO GeoLogic INC.

Project No: AFC001-019CCA

Borehole ID: WHGLRW017

Project: Focused Feasibility Study

Date: 8/17/99

Client: AFCEE

Geologist: B Nielsen

Location: Route 183

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
1–2		***Gravelly Silt*** 7.5YR 4/1 dk gray gravelly silt, dry, low plasticity, poorly sorted	-2	ML	50%	Dry	0.0	
3–4		***Silty Clay*** 7.5YR 4/3 brown silty clay, moderate plasticity, stiff, dry, moderately sorted	-4	CL	10%	Dry	0.0	
5–6		***Sandy Silt*** 7.5YR 6/4 lt brown sandy silt w/gravel, low plasticity, firm to loose, dry, moderately poor sorting	-6	ML	50%	Dry	0.0	Gravel is <5%, calcareous nodules, medium sized
7–8		***Silt with Gravel*** 7.5YR 6/4 lt brown silt w/gravel, low plasticity, firm to loose, dry, moderately sorted	-8	ML	60%	Dry	0.0	Gravel is <5%, calcareous nodules, medium sized
9–10		***Gravelly Silt*** 7.5YR lt brown gravelly silt, low plasticity, loose, dry, poorly sorted	-10	ML	60%	Dry	0.0	Gravel is 5-10%, limestone, rounded, large
11–12		***Gravelly Silt*** Same as above	-12	ML	100%	Dry	0.0	
13–14		***Sandy Gravelly Silt*** 7.5YR 6/4 lt brown sandy gravelly silt, low plasticity, loose, dry, poorly sorted	-14	ML	100%	Dry	0.0	Increase in gravel, 10-15%, limestone and chert, medium to large
15–16		***Silty Sandy Gravel*** 10YR 6/6 brownish yellow silty sandy gravel, no plasticity, loose, moist to wet, poorly sorted	-16	GM	50%	Moist Wet	0.0	Gravel is >50%, limestone and chert, small to large Hit water at 16'

Drilled By: Geoprojects International

Drill Method: HSA

Drilling Equipment: CME 75

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 6.25"

Total Depth Drilled: 25'

Sheet: 1 of 2

524 186

Project No: AFC001-019CCA

Borehole ID: WHGLRW017

Project: Focused Feasibility Study

Date: 8/17/99

Client: AFCEE

Geologist: B Nielsen

Location: Route 183

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
17		***Silty Sandy Gravel*** 10YR 6/6 brownish yellow silty sandy gravel, loose, saturated, poorly sorted	-18	GM		Wet	0.0	Small to medium gravel
18								
19		***Silty Gravel with Sand*** 10YR 6/6 brownish yellow silty gravel w/sand, loose, saturated, poorly sorted	-20	GM		Wet	0.0	
20								
21		***Silty Sandy Gravel*** 10YR 6/6 brownish yellow silty sandy gravel, loose, saturated, poorly sorted	-22	GM	100%	Wet	0.0	Small to large gravel
22								
23		***Silty Sandy Gravel*** Silty sandy gravel, loose, saturated, poorly sorted	-24	GM	100%	Wet	0.0	Increasing clay at 23.5 - 24' (stiff)
24		***Gravelly Clay*** Gravelly clay, stiff, moist, poorly sorted, moderate to high plasticity	-25	GC	100%	Moist	0.0	
25								Bedrock at 25'
26								
27								
28								
29								
30								
31								
32								

Drilled By: Geoprojects International

Drill Method: HSA

Drilling Equipment: CME 75

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 6.25"

Total Depth Drilled: 25'

Sheet: 2 of 2

HYDRO GeoLogic INC.

Project No: AFC001-019CCA

Borehole ID: WHGLRW018

Project: Focused Feasibility Study

Date: 6/21/99

Client: AFCEE

Geologist: B Nielsen

Location:

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
1, 2, 3, 4, 5		***Silty Clay*** 2.5YR 2.5/4 dk reddish brown silty clay, high plasticity, stiff, well sorted	-5	CL	60%	Damp	0.0	Grassy topsoil and some root material
6, 7, 8, 9, 10		***Gravelly Clay*** 7.5YR 6/8 reddish yellow gravelly clay, stiff, moderate plasticity, poorly sorted	-10	CL	50%	Damp	0.0	Gravel is medium, large, and cobble size; predominantly limestone
11, 12, 13, 14, 15		***Gravelly Clay*** 7.5YR 5/8 strong brown gravelly clay, stiff, moderate plasticity, v poorly sorted	-15	CL	50%	Damp	0.0	Gravel is medium, large, and cobble size; predominantly limestone
16								

Drilled By: Environmental Drillers

Drill Method: HSA

Drilling Equipment: CME 75

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 8.25"

Total Depth Drilled: 28'

Sheet: 1 of 2

524 183

Project No: AFC001-019CCA

Borehole ID: WHGLRW018

Project: Focused Feasibility Study

Date: 6/21/99

Client: AFCEE

Geologist: B Nielsen

Location:

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
17 18 19 20		***Silty Gravel with Clay*** 10YR 5/6 yellowish brown silty gravel with clay, low to moderate plasticity, v poorly sorted	-20	GC	50%	Moist Wet	0.0	At 18' saturated gravel is medium, large, and cobble size; limestone and chert
21 22 23 24 25		***Sandy Silty Gravel*** 10YR 5/6 yellowish brown sandy silty gravel, loose, saturated, poorly sorted	-25	GM		Wet	0.0	Gravel is small/medium limestone and chert w/ some large cobbles Less silt than above w/ more sand
26 27 28		***Sandy Silty Gravel*** 10YR 5/6 yellowish brown sandy silty gravel, loose, poorly sorted, more sand than above	-28	GM		Wet	0.0	Gravel is small/medium limestone and chert At 27' deep orange/red At 28' v hard shaley clay
29 30 31 32								

Drilled By: Environmental Drillers

Drill Method: HSA

Drilling Equipment: CME 75

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 8.25"

Total Depth Drilled: 28'

Sheet: 2 of 2

HydroGeoLogic INC.

Project No: AFC001-019CCA

Borehole ID: WHGLRW019

Project: Focused Feasibility Study

Date: 6/18/99

Client: AFCEE

Geologist: B Nielsen

Location:

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
1, 2, 3, 4, 5		***Silty Clay*** 10YR 3/2 v dk brown silty clay, high plasticity, stiff, damp, well sorted	-5	CL	85%	Damp	0.0	Grassy topsoil and some root material and trace of gravel (calcareous nodules)
6, 7, 8, 9, 10		***Silty Clay*** 7.5YR 6/8 reddish yellow silty clay, high to moderate plasticity, stiff, damp, well to moderately sorted	-10	CL	90%	Damp	0.0	Increasing silt w/depth
11, 12, 13, 14, 15		***Clayey Gravel*** 7.5YR 5/8 strong brown clayey gravel, loose, v moist, v poorly sorted At 12.2' 10YR 7/2 lt gray silty gravel, loose, damp, poorly sorted	-15	GC	60%	Moist Damp	0.0	Large cobbles at 13'
16								Wet to saturated at 15'

Drilled By: Environmental Drillers

Drill Method: HSA

Drilling Equipment: CME 75

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 8.25"

Total Depth Drilled: 24'

Sheet: 1 of 2

524 190

HYDRO GeoLogic INC.

Project No: AFC001-019CCA

Borehole ID: WHGLRW019

Project: Focused Feasibility Study

Date: 6/18/99

Client: AFCEE

Geologist: B Nielsen

Location:

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
17		***Gravelly Sand with Silt*** 7.5YR 6/8 reddish yellow gravelly sand w/silt, moist, low plasticity, poorly sorted Around 16' 7.5YR 6/8 reddish yellow silty sandy gravel, loose, saturated, v poorly sorted		GM	60%	Moist Wet	0.0	Gravel is predominantly large to cobble size
18								
19								
20			-20					
21		***Silty Gravel*** Silty gravel, loose, saturated, some sand, poorly sorted				Wet	0.0	Gravel is medium to large composed of limestone, chert, and fossil material
22				GM				
23								
24			-24					Bedrock at 24' (limestone)
25								
26								
27								
28								
29								
30								
31								
32								

Drilled By: Environmental Drillers

Drill Method: HSA

Drilling Equipment: CME 75

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 8.25"

Total Depth Drilled: 24'

HYDRO GeoLogic INC.

Project No: AFC001-019CCA

Borehole ID: WHGLTA020

Project: Focused Feasibility Study

Date: 6/16/99

Client: AFCEE

Geologist: B Nielsen

Location:

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
1								Grassy topsoil
2		***Clay*** 10YR 3/1 v dk gray clay w/trace of calcareous nodules, high plasticity, stiff, damp, well sorted		CL	50%	Damp	0.0	
3								
4								
5			-5					
6								
7		***Gravelly Sandy Clay with Silt*** 10YR 5/6 yellowish brown gravelly sandy clay w/silt, moderate to high plasticity, stiff, moist, v poorly sorted		CL		Moist	0.0	
8								
9								Increased gravel from 9-9.5'
10			-10					
11								
12		***Clayey Gravel with Sand and Silt*** 10YR 5/4 yellowish brown clayey gravel w/sand and silt, moderate to low plasticity, firm, v poorly sorted		GC		Moist Wet	0.0	
13								
14								Saturation at 14'
15			-15					
16		***Silty Gravel*** 10YR 5/4 yellowish brown silty gravel, loose, saturated, moderately to poorly sorted	-16	GM		Wet	0.0	Hit bedrock at 16'

Drilled By: Environmental Drillers

Drill Method: HSA

Drilling Equipment: CME 75

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 8.25"

Total Depth Drilled: 16'

Sheet: 1 of 1

HydroGeoLogic INC.

Project No: AFC001-019CCA

Borehole ID: WHGLTA021

Project: Focused Feasibility Study

Date: 6/16/99

Client: AFCEE

Geologist: B Nielsen

Location:

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
1								Grassy topsoil
2		***Silty Clay*** 7.5YR 4/6 strong brown silty clay w/trace of gravel, high plasticity, stiff, well sorted, damp		CL	80%	Damp	0.0	Some calcareous nodules
3		Bottom ft 7.5YR 5/6 strong brown silty clay w/calcareous deposits, mod plasticity, stiff, well sorted						
4								Increase in silt
5			-5					
6								Gravel is mainly calcareous nodules (small to med) Trace of root material
7		***Gravelly Clayey Silt*** 7.5YR 5/6 strong brown gravelly clayey silt, moderate plasticity, stiff, poorly sorted		ML	80%	Damp	0.0	
8								
9								
10			-10					
11								
12		***Gravelly Clayey Silt*** 7.5YR 5/6 strong brown gravelly clayey silt, moderate plasticity, stiff, poorly sorted; from 13-15' 10YR 6/6 yellowish brown clayey silt w/some gravel, mod to high plasticity, stiff, mod sorted		ML	80%	Damp	0.0	
13								
14								
15			-15					Some calcareous nodules
16								

Drilled By: Environmental Drillers

Drill Method: HSA

Drilling Equipment: CME 75

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 8.25"

Total Depth Drilled: 21'

Sheet: 1 of 2

HydroGeoLogic INC.

Project No: AFC001-019CCA

Borehole ID: WHGLTA021

Project: Focused Feasibility Study

Date: 6/16/99

Client: AFCEE

Geologist: B Nielsen

Location:

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
17								
18		***Clayey Silt*** Clayey silt w/some gravel, same as above		ML		Damp	0.0	
19								
20			-20					
21		***Clayey Silt*** 10YR 6/6 yellowish brown clayey silt, moderate plasticity, stiff, well sorted, damp	-21	ML		Damp	0.0	Bedrock at 21' Groundwater not encountered
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								

Drilled By: Environmental Drillers

Drill Method: HSA

Drilling Equipment: CME 75

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 8.25"

Total Depth Drilled: 21'

Sheet: 2 of 2

524 194

HYDRO GeoLogic INC.

Project No: AFC001-019CCA

Borehole ID: WHGLTA022

Project: Focused Feasibility Study

Date: 6/17/99

Client: AFCEE

Geologist: B Nielsen

Location:

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
1, 2, 3, 4, 5		***Gravelly Clay with Sand*** 2.5YR 4/8 red gravelly clay w/sand, high plasticity, stiff, damp, poorly sorted	-5	CL	90%	Damp	0.0	Grassy topsoil Gravel is chert, limestone, quartz (small to med)
6, 7, 8, 9, 10		***Gravelly Sandy Clay*** 2.5YR 4/8 red gravelly sandy clay, mod to high plasticity, firm, moist, poorly sorted	-10	CL	25%	Moist	0.0	Gravel in shoe med size limestone
11, 12, 13, 14, 15		***Sand*** 10YR 7/6 yellow sand, dry, fine to medium, v well sorted	-15	SW		Dry	0.0	
16								

Drilled By: Environmental Drillers

Drill Method: HSA

Drilling Equipment: CME 75

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 8.25"

Total Depth Drilled: 32'

Sheet: 1 of 2

HYDRO GeoLogic INC.

Project No: AFC001-019CCA

Borehole ID: WHGLTA022

Project: Focused Feasibility Study

Date: 6/17/99

Client: AFCEE

Geologist: B Nielsen

Location:

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
17								Some clay inclusions at 17'
18		***Sand*** 10YR 7/6 yellow sand, loose, dry, fine to medium, well sorted		SW		Dry	0.0	
19								Trace of small gravel 19-20'
20			-20					
21								
22		***Gravelly Sand*** Gravelly sand grading into sandy gravel, loose, wet to saturated; 23.5-25' 10YR 7/4 v pale brown sand, med to coarse, loose, saturated, trace of gravel		SP	50%	Wet	0.0	Gravel is med to large Saturated at 22'
23								Thin gravelly clay layer separates lower sand zone
24								
25			-25					
26								Gravel is med to large chert, limestone, and quartz
27		***Gravel with Sand and Silt*** 10YR 7/4 v pale brown gravel, loose, saturated, some sand and silt; gravel is up to 3" in diameter		GP		Wet	0.0	
28								
29								
30			-30					Gravelly clay in shoe
31		***Gravel with Sand*** 7.5YR 7/6 reddish yellow gravel w/sand, saturated, loose		GP		Wet	0.0	Gravel is med to large and up to 3" in diameter
32			-32					Bedrock at 32'

Drilled By: Environmental Drillers

Drill Method: HSA

Drilling Equipment: CME 75

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 8.25"

Total Depth Drilled: 32'

Sheet: 2 of 2

524 196

Project No: AFC001-019CCA

Borehole ID: WHGLTA023

Project: Focused Feasibility Study

Date: 6/17/99

Client: AFCEE

Geologist: B Nielsen

Location:

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
1 2 3 4 5		***Silty Clay*** 7.5YR 3/4 dk brown silty clay w/trace of gravel, mod to high plasticity, stiff, moderately sorted, damp to dry	-5	CL	90%	Damp Dry	0.0	Grassy topsoil Increased calcareous deposits (nodules)
6 7 8 9 10		***Clayey Silt with Sand*** 7.5YR 5/6 strong brown clayey silt w/sand, moderate to low plasticity, firm to stiff, damp, moderately sorted	-10	ML	95%	Damp	0.0	Calcareous nodules present to 8' Decrease in clay, increase in silt and sand from 8-10'
11 12 13 14 15 16		***Gravelly Silty Sand*** 7.5YR 6/8 reddish yellow gravelly silty sand, loose, damp, v poorly sorted From 14-15' 10YR 6/4 lt yellowish brown clayey sand w/gravel, firm, low plasticity, damp, poorly sorted	-15	SP	80%	Damp	0.0	Sand is fine grained Large limestone cobbles at 14-15' Sand at bottom of sample in shoe Saturation at approx. 16-18'

Drilled By: Environmental Drillers

Drill Method: HSA

Drilling Equipment: CME 75

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 8.25"

Total Depth Drilled: 29'

Sheet: 1 of 2

HYDRO GeoLogic INC.

Project No: AFC001-019CCA

Borehole ID: WHGLTA023

Project: Focused Feasibility Study

Date: 6/17/99

Client: AFCEE

Geologist: B Nielsen

Location:

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
17 18 19 20		***Gravelly Sand*** 10YR 7/4 v pale brown gravelly sand, loose, wet to saturated, v poorly sorted, medium to coarse	-20	SW	20%	Wet	0.0	About 35% gravel Sand is coarse to medium grained and gravel is med to large limestone and chert
21 22 23 24 25		***No Recovery*** Rock lodged in barrel or loose sand	-25		0%	NA	NA	
26 27 28 29		***Gravelly Sand*** Gravelly sand, loose, saturated, poorly sorted	-29	GP		Wet	0.0	Sand is fine grained Bedrock at 29'
30 31 32								

Drilled By: Environmental Drillers

Drill Method: HSA

Drilling Equipment: CME 75

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 8.25"

Total Depth Drilled: 29'

Sheet: 2 of 2

524 198

Project No: AFC001-019CCA

Borehole ID: WHGLTA024

Project: Focused Feasibility Study

Date: 6/16/99

Client: AFCEE

Geologist: B Nielsen

Location:

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
1								Grassy topsoil and gravel from 0-1'
2		***Gravelly Clay*** 10YR 4/2 dk grayish brown gravelly clay, high plasticity, stiff, poorly sorted, damp		CL	25%	Damp	0.0	
3								
4								
5			-5					
6								
7		***Gravelly Clay*** 10YR 4/2 dk grayish brown gravelly clay, high plasticity, stiff, poorly sorted, damp From 9-10' weathered limestone gravel		CL	50%	Damp	0.0	
8								
9								Thin wet/saturated zone at 9.4 - 9.7'
10			-10					Bedrock at 10' Groundwater not encountered
11								
12								
13								
14								
15								
16								

Drilled By: Environmental Drillers

Drill Method: HSA

Drilling Equipment: CME 75

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 8.25"

Total Depth Drilled: 10'

Sheet: 1 of 1

HYDRO GeoLogic INC.

Project No: AFC001-0019CCA

Borehole ID: WHGLTA025

Project: Focused Feasibility Study

Date: 06/21/99

Client: AFCEE

Geologist: B Nielsen

Location:

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
1								Grass topsoil
2		***Silty Clay with Gravel*** 7.5YR 5/6 strong brown silty clay w/some gravel, moderate plasticity, firm, moderately sorted		CL		Damp	0.0	Gravel is small calcareous nodules
3								
4								
5			-5					
6								
7		***Silty Clayey Gravel*** 10YR 6/6 brownish yellow silty clayey gravel, moderately plastic, some sand, v poorly sorted, damp		CL		Damp	0.0	Gravel is med, large, and cobble sized
8								
9								
10			-10					
11								
12		***Silty Clayey Gravel*** Silty clayey gravel same as above		CL		Damp	0.0	Gravel is med, large, and cobble sized
13								
14								
15			-15					
16								

Drilled By: Environmental Drillers

Drill Method: HSA

Drilling Equipment: CME 75

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 8.25"

Total Depth Drilled: 20.8'

Sheet: 1 of 2

524 200

Project No: AFC001-0019CCA

Borehole ID: WHGLTA025

Project: Focused Feasibility Study

Date: 06/21/99

Client: AFCEE

Geologist: B Nielsen

Location:

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Elevation	ASTM	Recovery	Moisture	PID (ppm)	Remarks
17								
18		***Sandy Silt with Clay*** 10YR 6/4 lt yellowish brown sandy silt w/clay and some gravel, moderate plasticity, firm, moist to saturated Gravel at 19-20', medium sized		ML		Moist Wet	0.0	Saturated/wet at 18'
19								
20								Bedrock at 20.4'
			-20.8					
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								

Drilled By: Environmental Drillers

Drill Method: HSA

Drilling Equipment: CME 75

HydroGeoLogic, Inc.
1155 Herndon Pkwy, Suite 900
Herndon, VA 20170
(703) 478-5186 FAX (703) 471-4180

Hole Size: 8.25"

Total Depth Drilled: 20.8'

Sheet: 2 of 2

APPENDIX C.2
1999 SOUTHERN LOBE TCE PLUME DELINEATION
WELL CONSTRUCTION AND ABANDONMENT FORMS

HYDRO Geologic

WELL CONSTRUCTION DETAILS AND ABANDONMENT FORM

FIELD REPRESENTATIVE: Brad Wielsen

DRILLING CONTRACTOR: EDI

DRILLING TECHNIQUE: HSA

AUGER SIZE AND TYPE: 10 inch OD

BOREHOLE IDENTIFICATION: WH6LRW015

BOREHOLE DIAMETER: 10 inch

WELL IDENTIFICATION: WH6LRW015

WELL CONSTRUCTION START DATE: 6/22/99

WELL CONSTRUCTION COMPLETE DATE: 6/24/99

SCREEN MATERIAL: 0.01" slot Schedule 40 PVC

SCREEN DIAMETER: 4 inch

STRATUM-SCREENED INTERVAL (FT): 13.5-23.5

CASING MATERIAL: Schedule 40 PVC

CASING DIAMETER: 4 inch

TYPE OF FILTER PACK: Filter Sil/Quartz Sand

GRADIATION: 20/40

AMOUNT OF FILTER PACK USED: 11 bags

TYPE OF BENTONITE: Pure Gold (chips)

AMOUNT BENTONITE USED: 2 bags

TYPE OF CEMENT: Portland

AMOUNT CEMENT USED:

GROUT MATERIALS USED: Tremie

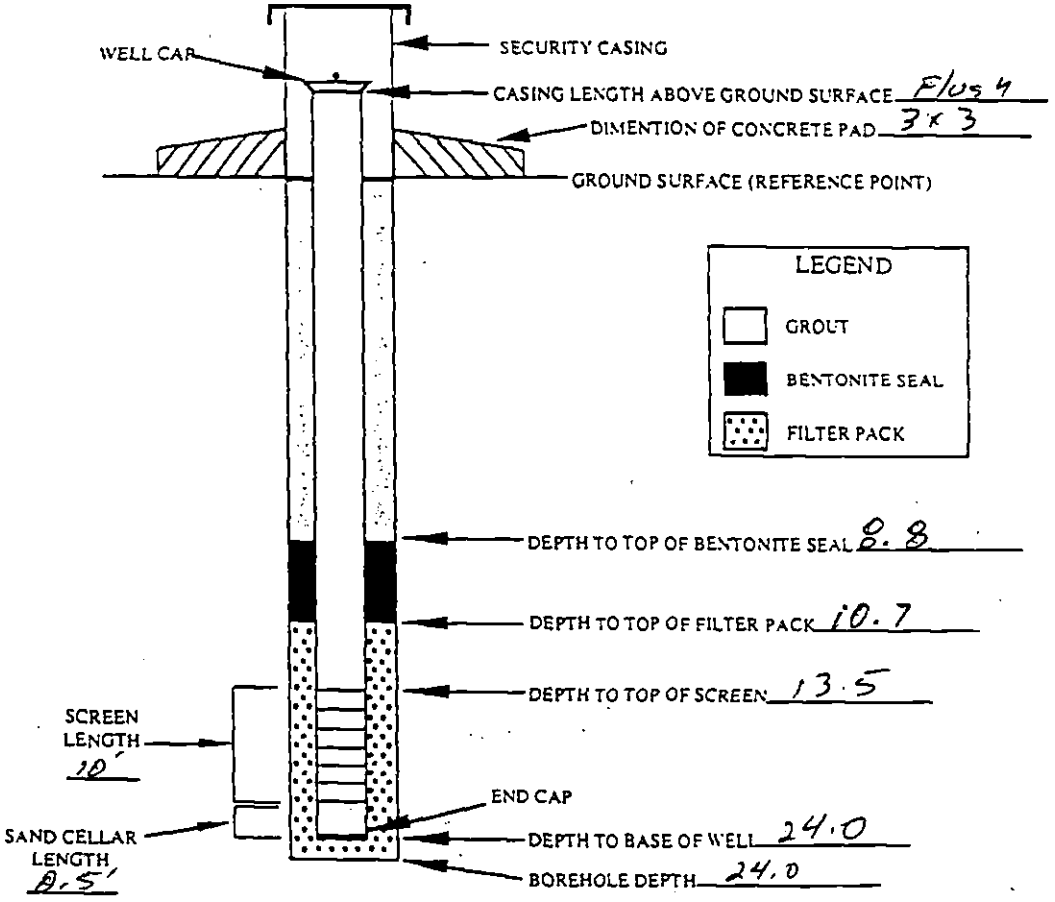
DIMENSIONS OF SECURITY CASING: 8 inch

TYPE OF WELL CAP: Locking/Expandable

TYPE OF END CAP: Threaded PVC

COMMENTS:

SPECIAL CONDITIONS
(describe and draw)



NOT TO SCALE

INSTALLED BY: Billy Conley

INSTALLATION OBSERVED BY: Brad Wielsen

DISCREPANCIES:

524 203

HYDRO GeoLogic INC.

WELL CONSTRUCTION DETAILS AND ABANDONMENT FORM

FIELD REPRESENTATIVE: Brad Nielsen

DRILLING CONTRACTOR: GeoProbe Int.

DRILLING TECHNIQUE: HSA

AUGER SIZE AND TYPE: 10"

BOREHOLE IDENTIFICATION: WHGLRW016

BOREHOLE DIAMETER: ~~WHGLRW016~~ 10" ID

WELL IDENTIFICATION: WHGLRW016

WELL CONSTRUCTION START DATE: 8/17/99

WELL CONSTRUCTION COMPLETE DATE: 8/17/99

SCREEN MATERIAL: 0.01" slot schedule 40 PVC

SCREEN DIAMETER: 4"

STRATUM-SCREENED INTERVAL (FT): 12.5-22.5

CASING MATERIAL: Schedule 40 PVC Riser

CASING DIAMETER: 4"

TYPE OF FILTER PACK: Silica Sand

GRADIATION: 20/40

AMOUNT OF FILTER PACK USED: 11 bags

TYPE OF BENTONITE: Holeplug bentonite chips

AMOUNT BENTONITE USED:

TYPE OF CEMENT: Cement

AMOUNT CEMENT USED:

GROUT MATERIALS USED: Tremie

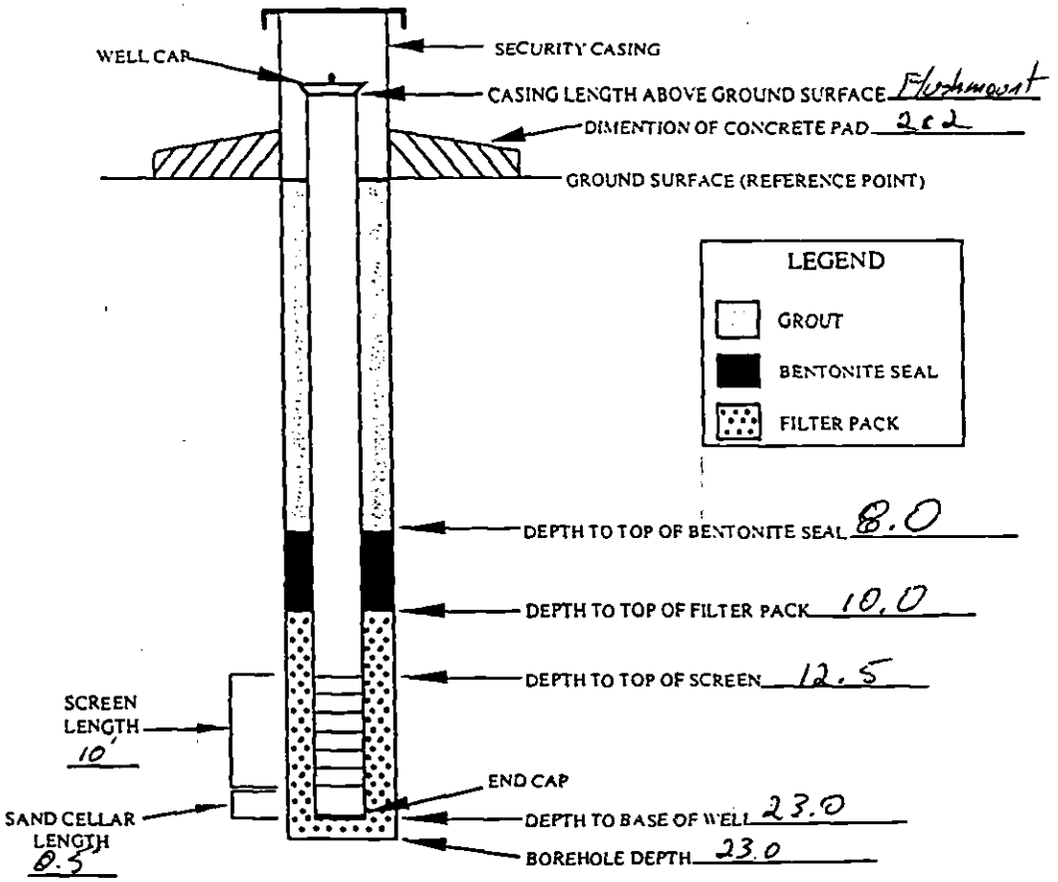
DIMENSIONS OF SECURITY CASING: 12 inch diam.

TYPE OF WELL CAP: expandable

TYPE OF END CAP: threaded PVC

COMMENTS:

SPECIAL CONDITIONS
(describe and draw)



NOT TO SCALE

INSTALLED BY: [redacted] Tony Lenhoff INSTALLATION OBSERVED BY: Brad Nielsen

DISCREPANCIES:

AFCEE FORM WAA.0

WELL CONSTRUCTION DETAILS AND ABANDONMENT FORM

HYDRO GeoLogic INC.

FIELD REPRESENTATIVE: Brad Nielsen

DRILLING CONTRACTOR: Geo Probe Inc

DRILLING TECHNIQUE: HSA

AUGER SIZE AND TYPE: 10"

BOREHOLE IDENTIFICATION: WHC-MW-17

BOREHOLE DIAMETER: 15"

WELL IDENTIFICATION: WHCRW017

WELL CONSTRUCTION START DATE: 8/17/99

WELL CONSTRUCTION COMPLETE DATE: 8/17/99

SCREEN MATERIAL: 0.01 Slot Schedule 40 PVC

SCREEN DIAMETER: 4.0"

STRATUM-SCREENED INTERVAL (FT): 13.9-23.9

CASING MATERIAL: Schedule 40 PVC Risers

CASING DIAMETER: 4.0"

TYPE OF FILTER PACK: Silica Sand / Colorado

GRADIATION: 16/30

AMOUNT OF FILTER PACK USED: 11 bags

TYPE OF BENTONITE: Hole Plug Bentonite chips

AMOUNT BENTONITE USED: 2 bags

TYPE OF CEMENT: Grout

AMOUNT CEMENT USED:

GROUT MATERIALS USED: Tremie

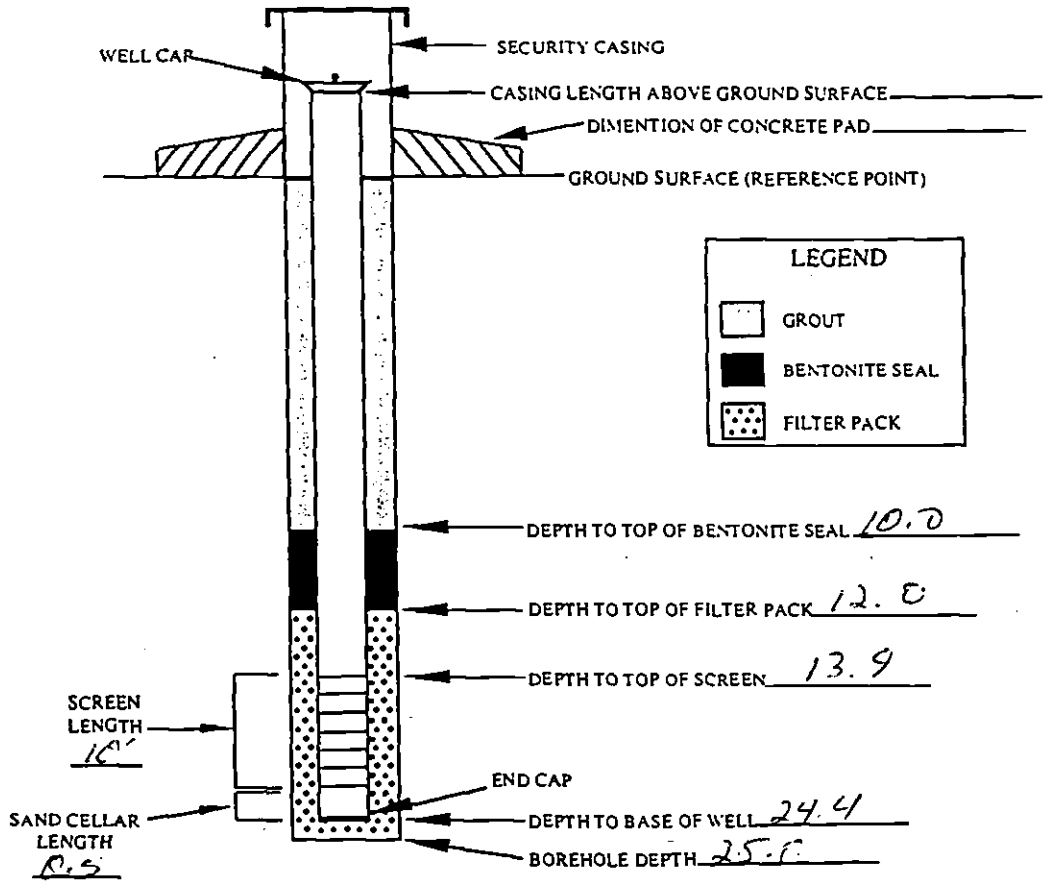
DIMENSIONS OF SECURITY CASING: 12" diam.

TYPE OF WELL CAP: Expandable

TYPE OF END CAP: threaded PVC

COMMENTS:

SPECIAL CONDITIONS
(describe and draw)



NOT TO SCALE

INSTALLED BY: Tony Landeros

INSTALLATION OBSERVED BY: Brad Nielsen

DISCREPANCIES:

AFCEE FORM WAA.0

524 205

HYDRO GeoLogic INC.

WELL CONSTRUCTION DETAILS AND ABANDONMENT FORM

FIELD REPRESENTATIVE: Brad Nielson

DRILLING CONTRACTOR: EDE

DRILLING TECHNIQUE: HSA

AUGER SIZE AND TYPE: 10" OD

BOREHOLE IDENTIFICATION: WHGLRW018

BOREHOLE DIAMETER: 10"

WELL IDENTIFICATION: WHGLRW018

WELL CONSTRUCTION START DATE: 6/4/99

WELL CONSTRUCTION COMPLETE DATE: 6/21/99

SCREEN MATERIAL: 0.01" Slot Schedule 40 PVC

SCREEN DIAMETER: 4 inch

STRATUM-SCREENED INTERVAL (FT): 12.5-27.5

CASING MATERIAL: Schedule 40 PVC

CASING DIAMETER: 4 inch

TYPE OF FILTER PACK: Filter Sil / Quartz sand

GRADIATION: 20/40

AMOUNT OF FILTER PACK USED: 13 bags

TYPE OF BENTONITE: Pure Gold (chips)

AMOUNT BENTONITE USED: 1.5 bags

TYPE OF CEMENT: Portland

AMOUNT CEMENT USED:

GROUT MATERIALS USED: Hand Mix

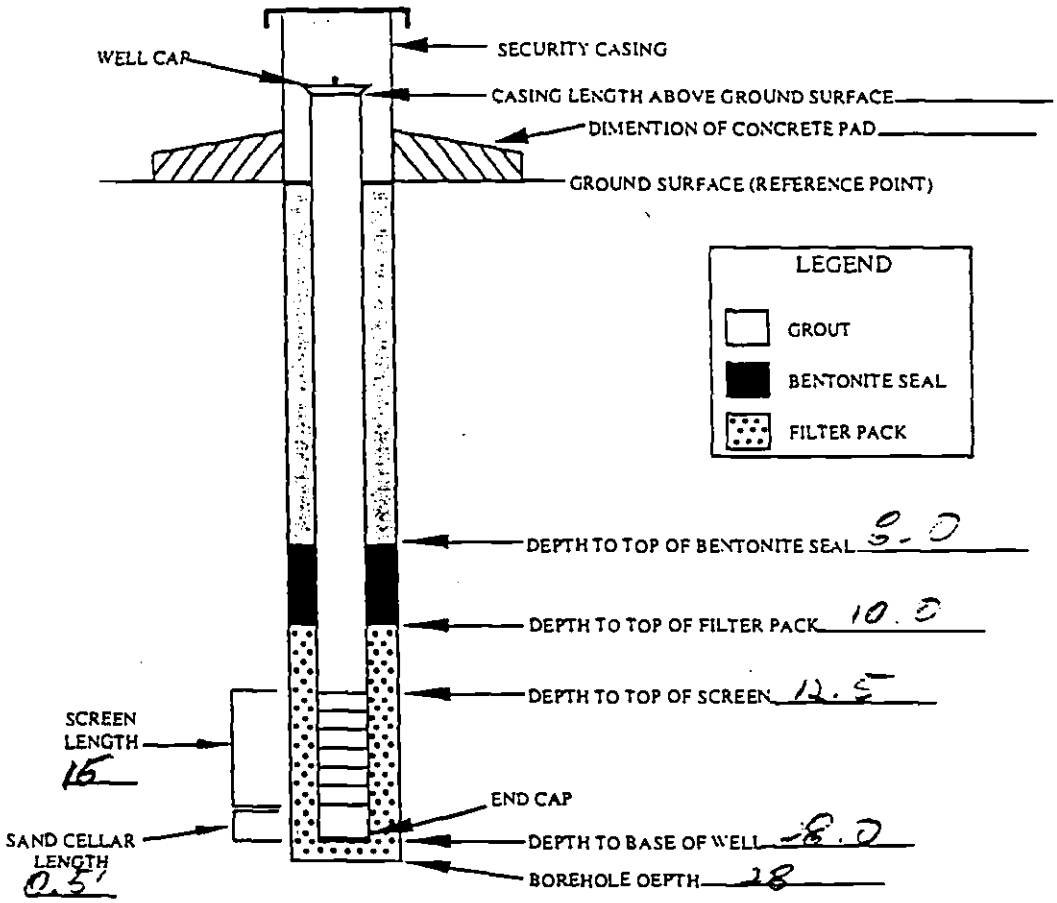
DIMENSIONS OF SECURITY CASING: 2.5

TYPE OF WELL CAP: Locking Expandable

TYPE OF END CAP: Threaded PVC

COMMENTS:

SPECIAL CONDITIONS
(describe and draw)



NOT TO SCALE

INSTALLED BY: Billy Conley

INSTALLATION OBSERVED BY: Brad A Nielson

DISCREPANCIES:

AFCEE FORM WAA.0

HYDRO Geologic INC.

WELL CONSTRUCTION DETAILS AND ABANDONMENT FORM

FIELD REPRESENTATIVE: Brad Nielsen

DRILLING CONTRACTOR: EDI

DRILLING TECHNIQUE: HSA

AUGER SIZE AND TYPE: 10 in (OD)

BOREHOLE IDENTIFICATION: WHGLRW019

BOREHOLE DIAMETER: 10 inch

WELL IDENTIFICATION: WHGLRW019

WELL CONSTRUCTION START DATE: 6/18/99

WELL CONSTRUCTION COMPLETE DATE: 6/18/99

SCREEN MATERIAL: Schedule 40 PVC

SCREEN DIAMETER: 4 inch

STRATUM-SCREENED INTERVAL (FT): 8-23.0

CASING MATERIAL: Schedule 40 PVC

CASING DIAMETER: 4 inch

TYPE OF FILTER PACK: Filter sil / Quartz sand

GRADIATION: #0/40

AMOUNT OF FILTER PACK USED: 13 bags

TYPE OF BENTONITE: Pure gold (chips)

AMOUNT BENTONITE USED: 1 bag

TYPE OF CEMENT: Portland

AMOUNT CEMENT USED:

GROUT MATERIALS USED: NA (hand mix)

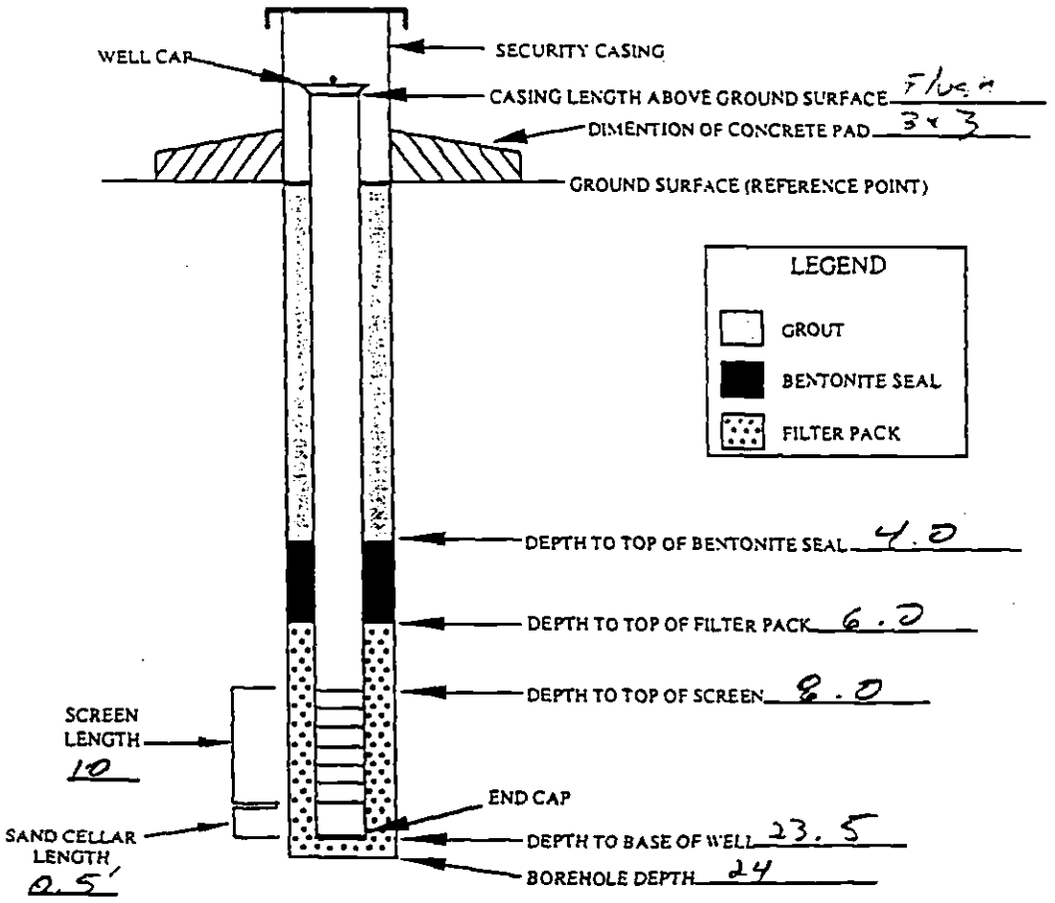
DIMENSIONS OF SECURITY CASING: 8 inch

TYPE OF WELL CAP: Locking / expandable

TYPE OF END CAP: Threaded PVC

COMMENTS:

SPECIAL CONDITIONS
(describe and draw)



NOT TO SCALE

INSTALLED BY: Billy Conley

INSTALLATION OBSERVED BY: Brad Nielsen

DISCREPANCIES:

AFCEE FORM WAA.0

524 207

HYDRO GeoLogic Inc.

WELL CONSTRUCTION DETAILS AND ABANDONMENT FORM

FIELD REPRESENTATIVE: Brad Nielsen

DRILLING CONTRACTOR: Environmental Drilling

DRILLING TECHNIQUE: HSA

AUGER SIZE AND TYPE: 8.0 OD. 4.25 ID

BOREHOLE IDENTIFICATION: WH6LTA020

BOREHOLE DIAMETER: 8.0

WELL IDENTIFICATION: WH6LTA020

WELL CONSTRUCTION START DATE: 6/16/99

WELL CONSTRUCTION COMPLETE DATE: 6/16/99

SCREEN MATERIAL: 0.01" slot Schedule 40 PVC

SCREEN DIAMETER: 2.0 inch

STRATUM-SCREENED INTERVAL (FT): 5-15'

CASING MATERIAL: Schedule 40 PVC

CASING DIAMETER: 2.0 inch

TYPE OF FILTER PACK: FilterSil/Industrial Quartz

GRADIATION: 20/40

AMOUNT OF FILTER PACK USED: 6.5 bags

TYPE OF BENTONITE: Bonenite Chips

AMOUNT BENTONITE USED: 1 bag

TYPE OF CEMENT: Portland

AMOUNT CEMENT USED:

GROUT MATERIALS USED: Handmix

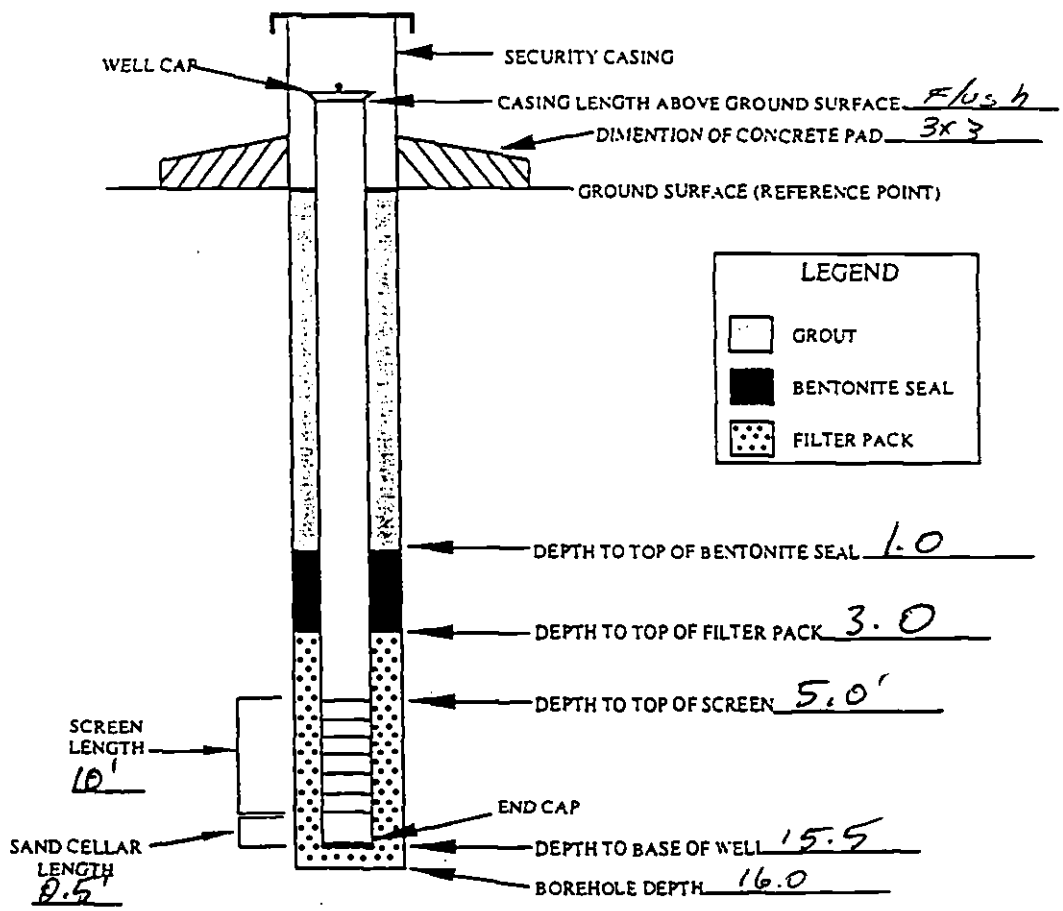
DIMENSIONS OF SECURITY CASING: 8.0

TYPE OF WELL CAP: Expandable cap

TYPE OF END CAP: threaded PVC

COMMENTS:

SPECIAL CONDITIONS
(describe and draw)



NOT TO SCALE

INSTALLED BY: Billy Conley

INSTALLATION OBSERVED BY: Brad Nielsen

DISCREPANCIES:

AFCEE FORM WAA.0

HYDRO Geologic

WELL CONSTRUCTION DETAILS AND ABANDONMENT FORM

FIELD REPRESENTATIVE: Brad Nelson

DRILLING CONTRACTOR: EDI

DRILLING TECHNIQUE: HSA
AUGER SIZE AND TYPE: 8.0 inch OD

BOREHOLE IDENTIFICATION: W46LTA022
BOREHOLE DIAMETER: 8.0 inch
WELL IDENTIFICATION: W46LTA022

WELL CONSTRUCTION START DATE: 6/17/97
WELL CONSTRUCTION COMPLETE DATE: 6/17/97

SCREEN MATERIAL: 0.01" slot Schedule 40 PVC
SCREEN DIAMETER: 2.0 inch
STRATUM-SCREENED INTERVAL (FT): 17 - 32

CASING MATERIAL: Schedule 40 PVC
CASING DIAMETER: 2.0 inch

TYPE OF FILTER PACK: Filter sil Quartz sand
GRADIATION: 20/40
AMOUNT OF FILTER PACK USED: 8 bags

TYPE OF BENTONITE: bentonite chips (Pure Gold)
AMOUNT BENTONITE USED: 1 bag

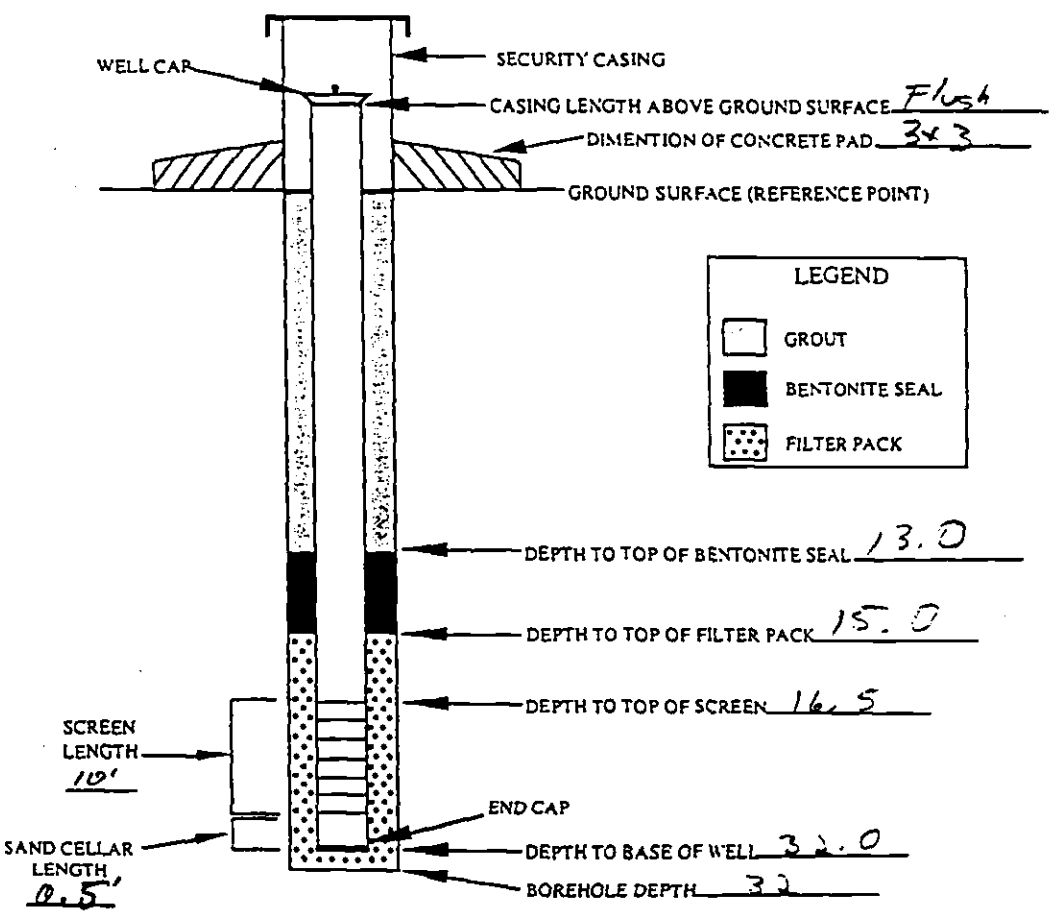
TYPE OF CEMENT: Portland
AMOUNT CEMENT USED:
GROUT MATERIALS USED: Tremmie

DIMENSIONS OF SECURITY CASING: 8.0"

TYPE OF WELL CAP: Locking/Expandable
TYPE OF END CAP: Threaded PVC

COMMENTS:

SPECIAL CONDITIONS
(describe and draw)



NOT TO SCALE

INSTALLED BY: Billy Conley INSTALLATION OBSERVED BY: Brad Nelson

DISCREPANCIES:

AFCEE FORM WAA.0

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HYDRO GeoLogic INC.

WELL CONSTRUCTION DETAILS AND ABANDONMENT FORM

FIELD REPRESENTATIVE: Brad Wielsen

DRILLING CONTRACTOR: EDI

DRILLING TECHNIQUE: HSA

AUGER SIZE AND TYPE: 8.0 OD

BOREHOLE IDENTIFICATION: WH6LTA023

BOREHOLE DIAMETER: 8.0

WELL IDENTIFICATION: WH6LTA023

WELL CONSTRUCTION START DATE: 6/17/99

WELL CONSTRUCTION COMPLETE DATE: 6/17/99

SCREEN MATERIAL: 0.01" slot Schedule 40 PVC

SCREEN DIAMETER: 2 inch

STRATUM-SCREENED INTERVAL (FT): 7-27'

CASING MATERIAL: Schedule 40 PVC

CASING DIAMETER: 2 inch

TYPE OF FILTER PACK: Filter Sil, Quartz Sand

GRADIATION: 20/40

AMOUNT OF FILTER PACK USED: 10 bags

TYPE OF BENTONITE: Bentonite chips (Pure Gold)

AMOUNT BENTONITE USED: 1 bag

TYPE OF CEMENT: Portland

AMOUNT CEMENT USED:

GROUT MATERIALS USED: Hand Mix

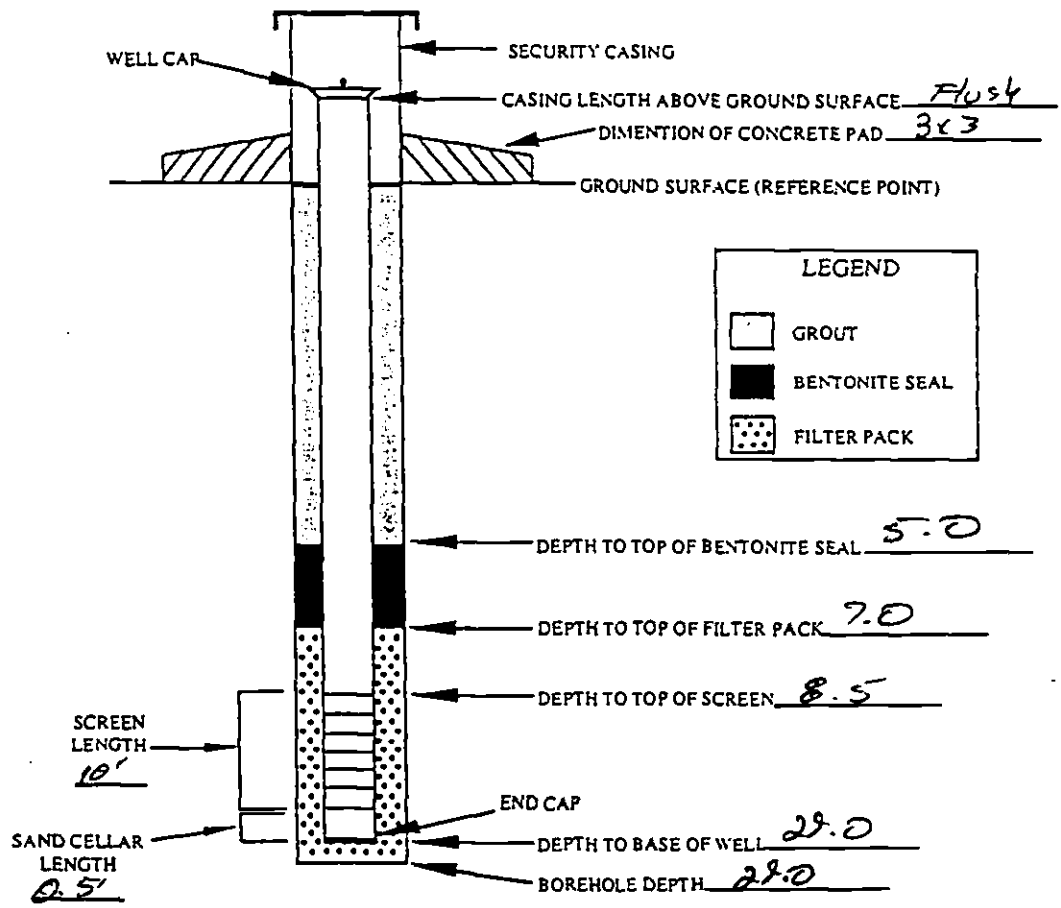
DIMENSIONS OF SECURITY CASING: 8.0"

TYPE OF WELL CAP: Locking/expandable

TYPE OF END CAP: Threaded PVC

COMMENTS:

SPECIAL CONDITIONS
(describe and draw)



NOT TO SCALE

INSTALLED BY: Billy Conley

INSTALLATION OBSERVED BY: Brad Wielsen

DISCREPANCIES:

AFCEE FORM WAA.0

HYDRO GeoLogic

WELL CONSTRUCTION DETAILS AND ABANDONMENT FORM

FIELD REPRESENTATIVE: Brad Nielsen

DRILLING CONTRACTOR: EDI

DRILLING TECHNIQUE: HSA
AUGER SIZE AND TYPE: 8.0 inch OD

BOREHOLE IDENTIFICATION: WH6LTA025
BOREHOLE DIAMETER: 8.0 inch
WELL IDENTIFICATION: WH6L-A025

WELL CONSTRUCTION START DATE: 6/21/99
WELL CONSTRUCTION COMPLETE DATE: 6/21/99

SCREEN MATERIAL: 0.010" Schedule 40 PVC
SCREEN DIAMETER: 2 inch
STRATUM-SCREENED INTERVAL (FT): 10.5 - 20.5

CASING MATERIAL: Schedule 40 PVC
CASING DIAMETER: 2 inch

TYPE OF FILTER PACK: Filter Silica Sand
GRADIATION: 20/40
AMOUNT OF FILTER PACK USED: 5 bags

TYPE OF BENTONITE: chips (Pure Gold)
AMOUNT BENTONITE USED: 1 bag

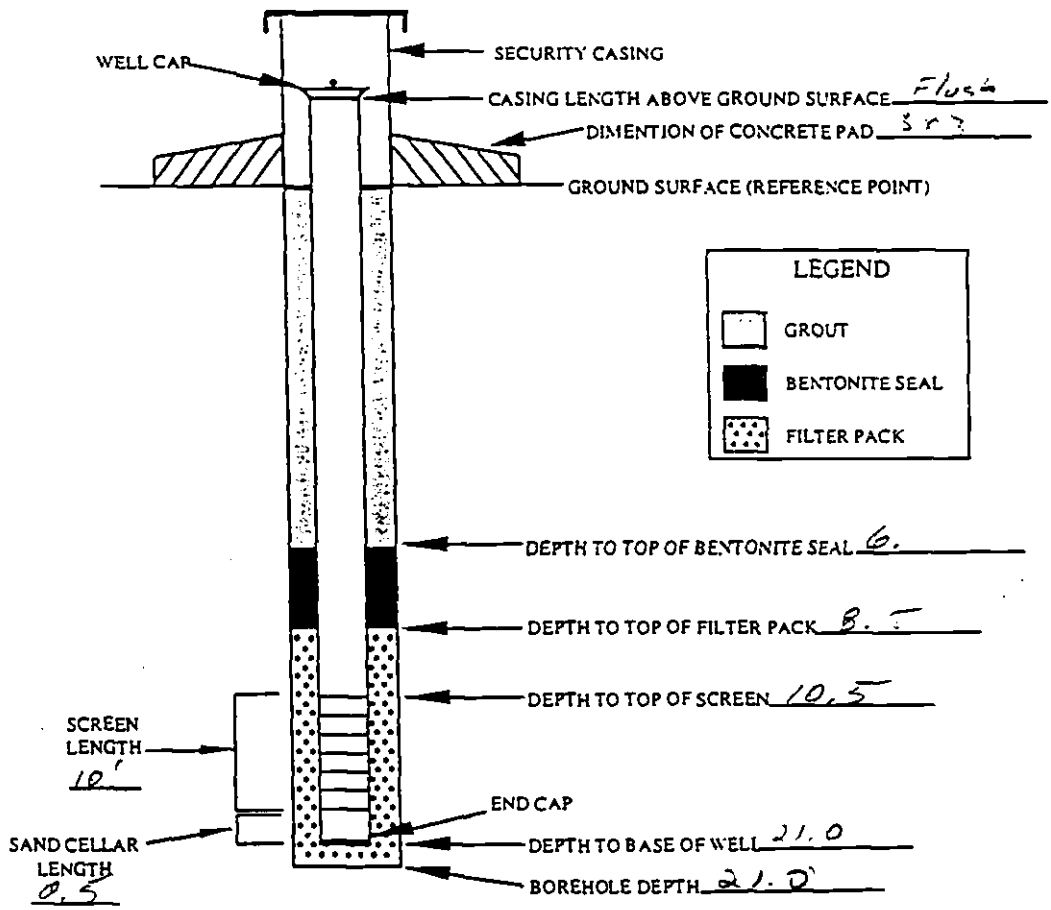
TYPE OF CEMENT: Portland
AMOUNT CEMENT USED:
GROUT MATERIALS USED: Hydromix

DIMENSIONS OF SECURITY CASING: 8 8"

TYPE OF WELL CAP: Expanding locking
TYPE OF END CAP: threaded PVC

COMMENTS:

SPECIAL CONDITIONS
(describe and draw)



NOT TO SCALE

INSTALLED BY: Billy Conley INSTALLATION OBSERVED BY: Brad Nielsen

DISCREPANCIES:

APPENDIX C.3
1999 SOUTHERN LOBE TCE PLUME DELINEATION
WELL DEVELOPMENT LOGS

HYDRO GeoLogic INC.

WELL DEVELOPMENT RECORD

WELL/PIEZOMETER ID WHGLRW015
SHEET 1 of 4

PROJECT NAME: NAS Fort Worth JRB PROJECT NO.: AFC001-19CCA DATE: 7/27/99

LOCATION: Off base DATE INSTALLED:

TOTAL DEPTH (FTOC) 23.11 CASING DIAMETER 4.0"

METHODS OF DEVELOPMENT

☐ Swabbing ☐ Bailing ☒ Pumping ☐ Describe surge & purge with well development pump

Equipment decontaminated prior to development ☒ Yes ☐ NO

Describe Alcanox, Rinse, DI Rinse

EQUIPMENT NUMBERS:

pH Meter 206280 EC Meter 206280 Turbidity Meter 806125 Thermometer 206280

CASING VOLUME INFORMATION:

Casing ID (inch)	1.0	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (A) (gal/ft)	0.04	0.09	0.16	0.2	0.37	0.65	0.75	1.0	1.5	2.0	2.6

PURGING INFORMATION:

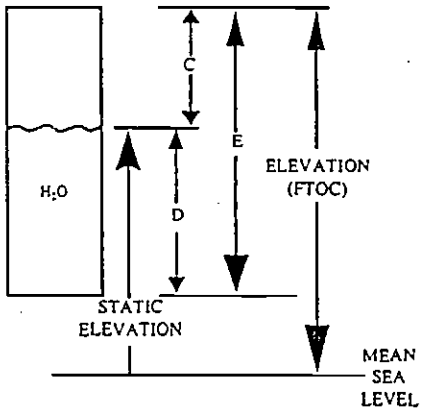
Measured Well Depth (B) 23.11 ft.

Measured Water Level Depth (C) 14.49 ft.

Length of Static Water Colume (D) _____ (B) - _____ (C) = _____ ft.

Casing Water Volume (E) + _____ (A) x _____ (D) = _____ gal

Total Purge Volume = _____ (gal)



Date	Time	Water Level (FTOC)	Volume Removed (gal)	pH	EC	Temperature F or (C)	Turbidity/ Sand (ppm)	DO mg/L	ORP	Comments
7/27/99	0920	14.49	0	start pumping				very silty (~2.0 L/min)		
	0933	14.55	8					silty, st		
	0938	14.57	10	stop pumping				stop pumping and surge for 5 minutes		
	0943	14.49	10	continue pumping				reduce rate to ~1.0 L/min, very silty		
	0955	14.50	~~10~~ 12					clearing		
	1022	14.50	16.0					raised pump to 18.7'		
	1035	~~14~~ NA	~~8~~ 19.0	6.03	830	20.86	1000+	1.17	308.4	very silty H_2O level below top of pump
	1045	NA	20.0	6.10	828	20.83	1000+	1.10	311.8	very silty
	1050	NA	~~32.0~~ 21.0	6.12	829	20.86	596	1.09	311.7	clearing
	1055	NA	~~33.0~~ 21.5	6.15	830	20.91	445	1.11	310.8	

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HYDRO GeoLogic INC.

WELL DEVELOPMENT RECORD

WELL/PIEZOMETER ID WHGLR0015
SHEET 2 of 9

PROJECT NAME: NAS Fort Worth JRB PROJECT NO.: AFCEE01-19CCA DATE: 7/27/99

LOCATION: OAF base DATE INSTALLED: _____

TOTAL DEPTH (FTOC) _____ CASING DIAMETER _____

METHODS OF DEVELOPMENT

☐ Swabbing ☐ Bailing ☐ Pumping ☐ Describe _____

Equipment decontaminated prior to development ☐ Yes ☐ NO

Describe _____

EQUIPMENT NUMBERS:

pH Meter _____ EC Meter _____ Turbidity Meter _____ Thermometer _____

CASING VOLUME INFORMATION:

Casing ID (inch)	1.0	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (A) (gal/ft)	0.04	0.09	0.16	0.2	0.37	0.65	0.75	1.0	1.5	2.0	2.6

PURGING INFORMATION:

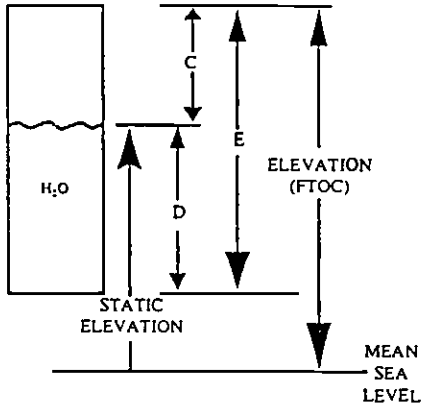
Measured Well Depth (B) _____ ft.

Measured Water Level Depth (C) _____ ft.

Length of Statie Water Colume (D) _____ - _____ = _____ ft.
(B) (C)

Casing Water Volume (E) + _____ x _____ = _____ gal
(A) (D)

Total Purge Volume = _____ (gal)



Date	Time	Water Level (FTOC)	Volume Removed (gal)	pH	EC	Temperature F or C	Turbidity/NTU ~~Sand (ppm)~~	DO mg/L	ORP Comments	
7/27/99	1100	NA	22.5 (W)	6.18	829	20.90	314	1.13	309.5	
	1105	NA	22.75	6.20	830	20.88	234	1.18	308.2	
	1110	NA	23.25	6.21	829	20.89	182	1.21	307.2	
	1115	NA	24.0	6.23	828	20.78	148	1.24	304.1	
	1120	NA	24.5	6.24	829	20.87	116.0	1.29	302.7	
	1125	NA	25.0	6.26	831	20.93	100.0	1.41	300.7	
	1135	NA	25.75	6.27	831	20.97	75.4	1.36	298.4	
	1140	NA	26.25	6.28	828	20.80	64.2	1.41	296.1	
	1145	NA	27.0	6.29	828	20.83	58.1	1.37	294.7	
	1150	NA	27.5	6.29	827	20.77	48.0	1.40	293.7	

HYDRO GeoLogic INC.

WELL DEVELOPMENT RECORD

WELL/PIEZOMETER ID WHGLRW015
SHEET 3 of 4

PROJECT NAME: NAS Fort Worth JRB PROJECT NO.: AFC001-19CCA DATE: 7/27/99

LOCATION: Offbase DATE INSTALLED: _____

TOTAL DEPTH (FTOC) _____ CASING DIAMETER _____

METHODS OF DEVELOPMENT

☐ Swabbing ☐ Bailing ☐ Pumping ☐ Describe _____

Equipment decomtaminated prior to development ☐ Yes ☐ NO

Describe _____

EQUIPMENT NUMBERS:

pH Meter _____ EC Meter _____ Turbidity Meter _____ Thermometer _____

CASING VOLUME INFORMATION:

Casing ID (inch)	1.0	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (A) (gal/ft)	0.04	0.09	0.16	0.2	0.37	0.65	0.75	1.0	1.5	2.0	2.6

PURGING INFORMATION:

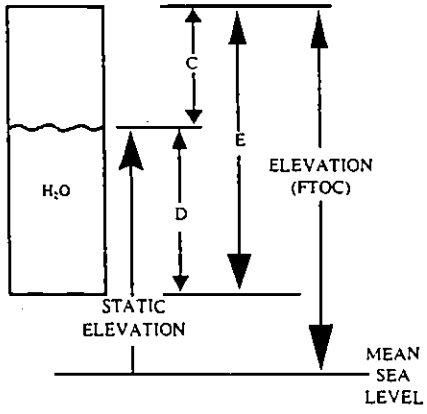
Measured Well Depth (B) _____ ft.

Measured Water Level Depth (C) _____ ft.

Length of Static Water Colume (D) _____ - _____ = _____ ft.
(B) (C)

Casing Water Volume (E) + _____ x _____ = _____ gal
(A) (D)

Total Purge Volume = _____ (gal)



Date	Time	Water Level (FTOC)	Volume Removed (gal)	pH	EC	Temperature F or ℃	Turbidity/ Sand (ppm)	DO mg/L	ORP	Comments
7/27/99	1155	NA	28.0	6.30	828	20.81	41.0	1.39	292.3	
	1200	NA	28.5	6.30	830	20.95	40.5	1.40	291.2	lowered flow rate to 0.5L/min
	1205	NA	28.75	6.31	852	20.97	37.4	1.40	289.4	
	1210	NA	30.0	6.31	838	21.38	21.7	1.43	288.3	
	1215	NA	30.5	6.32	836	21.30	20.0	1.44	286.7	
	1220	NA	31.0	6.32	839	21.49	18.0	1.40	282.5	
	1225	NA	31.5	6.32	839	21.45	17.0	1.47	280.4	
	1230	NA	32.0	6.32	838	21.38	16.0	1.50	279.6	
	1235	NA	32.75	6.32	836	21.30	17.0	1.51	279.8	
	1240	NA	33.25	6.32	833	21.10	16.0	1.48	278.7	

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HYDRO GeoLogic INC.

WELL DEVELOPMENT RECORD

WELL/PIEZOMETER ID WH6LRW0015
SHEET 4 of 4

PROJECT NAME: _____ PROJECT NO. : _____ DATE: _____

LOCATION: _____ DATE INSTALLED: _____

TOTAL DEPTH (FTOC) _____ CASING DIAMETER _____

METHODS OF DEVELOPMENT

☐ Swabbing ☐ Bailing ☐ Pumping ☐ Describe _____

Equipment decomtaminated prior to development ☐ Yes ☐ NO

Describe_____

EQUIPMENT NUMBERS:

pH Meter _____ EC Meter _____ Turbidity Meter _____ Thermometer _____

CASING VOLUME INFORMATION:

Casing ID (inch)	1.0	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (A) (gal/ft)	0.04	0.09	0.16	0.2	0.37	0.65	0.75	1.0	1.5	2.0	2.6

PURGING INFORMATION:

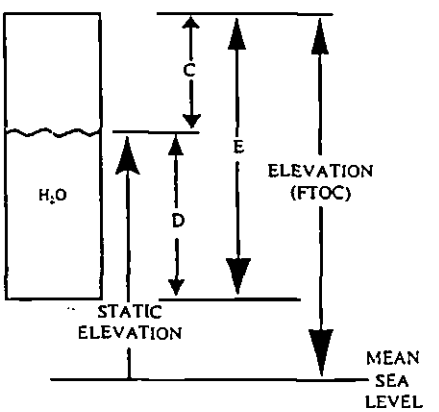
Measured Well Depth (B) _____ft.

Measured Water Level Depth (C) _____ft.

Length of Static Water Colume (D) _____ - _____ = _____ ft.
(B) (C)

Casing Water Volume (E) + _____ x _____ = _____ gal
(A) (D)

Total Purge Volume = _____ (gal)



Date	Time	Water Level (FTOC)	Volume Removed (gal)	pH	EC	Temperature F or C	Turbidity/ Sand (ppm)	DO mg/L	ORP	Comments
7/27/99	1245	NA	33.75	6.32	832	21.00	13.0	1.46	277.3	
	1250	NA	34.0	6.32	833	21.05	13.0	1.46	275.2	
	1255	NA	35.0	6.32	831	21.07	11.0	1.45	273.0	
	1300	NA	35.25	6.32	829	20.900	10.5	1.45	270.2	
	1305	NA	36.0	6.32	833	21.11	9.9	1.41	266.4	sonic warning of open well
	1315	NA	37.0	6.31	834	21.18	7.67	1.45	254.6	
	1325	NA	38.5	6.29	836	21.33	7.0	1.48	245.0	
	1335	NA	39.5	6.29	835	21.35	7.1	1.48	246.0	

AFCEE FORM WD.0

HYDRO GeoLogic INC.

WELL DEVELOPMENT RECORD

WELL/PIEZOMETER ID: HGLRW016
SHEET 1 of 7

PROJECT NAME: ASFW JRB PROJECT NO.: AFC001-19CCA DATE: 8/19/99

LOCATION: Roaring Springs/183 DATE INSTALLED: 8/17/99

TOTAL DEPTH (FTOC) 22.63 CASING DIAMETER 4"

METHODS OF DEVELOPMENT

☐ Swabbing ☐ Bailing ☒ Pumping ☐ Describe

Equipment decontaminated prior to development ☑ Yes ☐ NO

Describe Alconox, double rinse

EQUIPMENT NUMBERS:

pH Meter #201042R EC Meter #201042R Turbidity Meter #201042R Thermometer #201042R

CASING VOLUME INFORMATION:

Casing ID (inch)	1.0	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (A) (gal/ft)	0.04	0.09	0.16	0.2	0.37	0.65	0.75	1.0	1.5	2.0	2.6

PURGING INFORMATION:

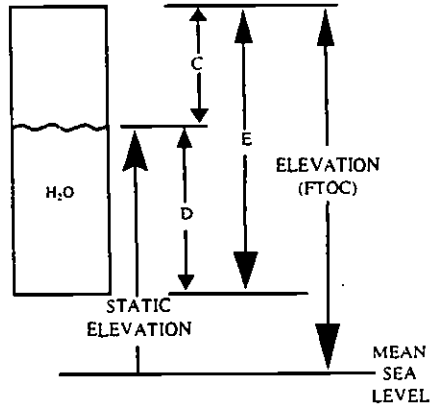
Measured Well Depth (B) 22.63 ft.

Measured Water Level Depth (C) 13.68 ft.

Length of Static Water Colume (D) _____ (B) - _____ (C) = _____ ft.

Casing Water Volume (E) = _____ (A) x _____ (D) = _____ gal

Total Purge Volume = 55.5 (gal)



Date	Time	Water Level (FTOC)	Volume Removed (G) (gal)	pH	EC	Temperature F or C	Turbidity/ Sand (ppm)	DO mg/L	ORP	Comments
8/19/99	0905	13.68								Surge for 10 min
	0915	Start pumping at 1L/min								very silty
	0926	13.90	2.5							Increase rate to 1.6L/min
	0932	13.86	4.0							very silty
	0957	13.86	12.0							very silty. Stop pumping and Surge well for 5 min.
	1004	Resume pumping								raised pump inlet to 18.0
	1024	below pump inlet	20.0							very silty lower pump.
	1047	13.81	28.0							very silty reduce flow rate to 0.5L and raise pump to 8.0
	1115	—	33.0	6.38	814.0	24.24	1000+	12.6	176.4	very silty
	1120	—	33.7	6.43	803.0	23.52	1000+	12.62	181.1	very silty

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HYDRO GeoLogic INC.

WELL DEVELOPMENT RECORD

WELL/PIEZOMETER ID WH6LRW016
SHEET 2 of 4

PROJECT NAME: _____ PROJECT NO.: AFC001-19CCA DATE: 8/19/90

LOCATION: _____ DATE INSTALLED: _____

TOTAL DEPTH (FTOC) _____ CASING DIAMETER _____

METHODS OF DEVELOPMENT

☐ Swabbing ☐ Bailing ☐ Pumping ☐ Describe _____

Equipment decontaminated prior to development ☐ Yes ☐ NO

Describe _____

EQUIPMENT NUMBERS:

pH Meter _____ EC Meter _____ Turbidity Meter _____ Thermometer _____

CASING VOLUME INFORMATION:

Casing ID (inch)	1.0	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (A) (gal/ft)	0.04	0.09	0.16	0.2	0.37	0.65	0.75	1.0	1.5	2.0	2.6

PURGING INFORMATION:

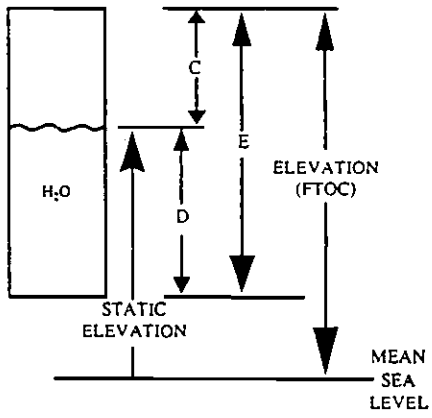
Measured Well Depth (B) _____ ft.

Measured Water Level Depth (C) _____ ft.

Length of Static Water Colume (D) _____ (B) - _____ (C) = _____ ft.

Casing Water Volume (E) = _____ (A) x _____ (D) = _____ gal

Total Purge Volume = _____ (gal)



Date	Time	Water Level (FTOC)	Volume Removed (gal)	pH	EC	Temperature F or C	Turbidity/ Sand (ppm)	DO mg/L	ORP Comments	comments
8/19/90	1125	–	34.3	6.47	803	23.60	1000+	12.03	185.8	
	1130	–	35.2	6.50	804.0	23.57	1000+	10.77	187.8	
	1135	–	35.9	6.53	801.0	23.46	1300.0	9.71	187.4	
	1140	–	37.0	6.56	800.0	23.40	1140.0	8.60	185.7	
	1145	–	37.5	6.57	801.0	23.41	1016.0	8.19	185.0	
	1150	–	38.0	6.59	799.0	23.31	691	7.51	183.5	
	1155	–	39.0	6.59	798.0	23.30	485	6.99	182.0	
	1200	–	40.0	6.60	800	23.45	272	6.67	181.3	
	1205	–	40.7	6.61	797	23.27	181.3	6.26	179.5	
	1210	–	41.5	6.61	797	23.35	115.7	5.80	177.4	

AFCEE FORM WD.0

HYDRO GeoLogic INC.

WELL DEVELOPMENT RECORD

WELL/PIEZOMETER ID WHG1 Rwsp6
SHEET 3 of 4

PROJECT NAME: _____ PROJECT NO.: AFCEE01-19CCA DATE: 8/19/00

LOCATION: _____ DATE INSTALLED: _____

TOTAL DEPTH (FTOC) _____ CASING DIAMETER _____

METHODS OF DEVELOPMENT

☐ Swabbing ☐ Bailing ☐ Pumping ☐ Describe _____

Equipment decontaminated prior to development ☐ Yes ☐ NO

Describe _____

EQUIPMENT NUMBERS:

pH Meter _____ EC Meter _____ Turbidity Meter _____ Thermometer _____

CASING VOLUME INFORMATION:

Casing ID (inch)	1.0	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (A) (gal/ft)	0.04	0.09	0.16	0.2	0.37	0.65	0.75	1.0	1.5	2.0	2.6

PURGING INFORMATION:

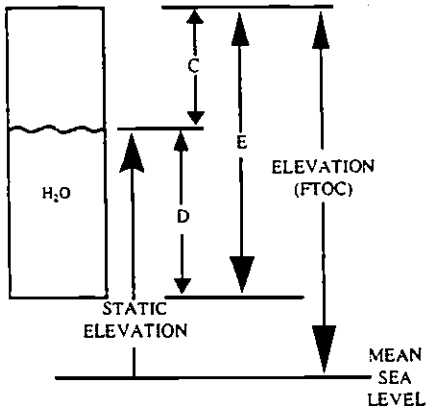
Measured Well Depth (B) _____ ft.

Measured Water Level Depth (C) _____ ft.

Length of Static Water Colume (D) _____ (B) - _____ (C) = _____ ft.

Casing Water Volume (E) + _____ (A) x _____ (D) = _____ gal

Total Purge Volume = _____ (gal)



Date	Time	Water Level (FTOC)	Volume Removed (gal)	pH	EC	Temperature F or C	Turbidity/ Sand (ppm)	DO mg/L	ORP	Comments
8/19/00	1215	—	42.5	6.62	798.0	23.36	81.4	5.47	175.7	
	1220	—	43.0	6.62	798.0	23.40	57.0	5.16	175.0	
	1225	—	43.9	6.62	801.0	23.55	45.0	4.86	173.7	
	1230	—	45.0	6.62	797.0	23.31	30.3	4.45	171.5	
	1235	—	45.6	6.62	796.0	23.26	27.0	4.27	170.9	
	1240	—	46.5	6.62	797.0	23.35	22.80	4.13	170.3	
	1244	—	47.4	6.63	802	23.62	20.2	4.01	169.3	
	1249	—	48.3	6.63	798	23.32	17.1	3.78	167.4	
	1255	—	48.8	6.64	797	23.35	15.2	3.63	165.5	
	1300	—	49.3	6.64	795	23.28	14.6	3.41	164.4	

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HYDRO GeoLogic INC.

WELL DEVELOPMENT RECORD

WELL/PIEZOMETER ID WH6LTA016
SHEET 4 of 4

PROJECT NAME: _____ PROJECT NO.: AFCEE-19CCA DATE: 8/19/99

LOCATION: _____ DATE INSTALLED: _____

TOTAL DEPTH (FTOC) _____ CASING DIAMETER _____

METHODS OF DEVELOPMENT

☐ Swabbing ☐ Bailing ☐ Pumping ☐ Describe _____

Equipment decomtaminated prior to development ☐ Yes ☐ NO

Describe _____

EQUIPMENT NUMBERS:

pH Meter _____ EC Meter _____ Turbidity Meter _____ Thermometer _____

CASING VOLUME INFORMATION:

Casing ID (inch)	1.0	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (A) (gal/ft)	0.04	0.09	0.16	0.2	0.37	0.65	0.75	1.0	1.5	2.0	2.6

PURGING INFORMATION:

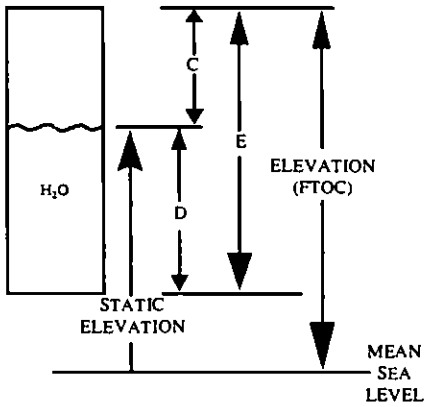
Measured Well Depth (B) _____ ft.

Measured Water Level Depth (C) _____ ft.

Length of Static Water Colume (D) _____ - _____ = _____ ft.
(B) (C)

Casing Water Volume (E) + _____ x _____ = _____ gal
(A) (D)

Total Purge Volume = _____ (gal)



Date	Time	Water Level (FTOC)	Volume Removed (gal)	pH	EC	Temperature F or C	Turbidity/ Sand (ppm)	DO mg/L	ORP Comments
8/19/99	1305	–	50.2	6.65	797	23.36	12.0	3.25	164.0
	1310	–	51.0	6.65	785	23.24	11.0	3.08	162.8
	1315	–	51.8	6.65	796	23.26	9.80	2.93	161.3
	1320	–	52.3	6.66	799	23.38	8.60	2.85	161.1
	1325	–	53.0	6.66	796	23.25	8.10	2.74	160.5
	1330	–	53.9	6.66	798	23.35	7.56	2.70	160.8
	1335	–	54.3	6.67	797	23.32	7.10	2.62	160.8
	1340	–	55.0	6.67	801	23.57	7.10	2.56	160.9
	1345	–	55.5	6.67	798	23.41	7.03	2.48	160.6

AFCEE FORM WD.0

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WELL DEVELOPMENT RECORD

WELL/PIEZOMETER ID WH6LRW017
SHEET 1 of 4

PROJECT NAME: NAS Fallon with JRB PROJECT NO.: AFCEE01-19CCA DATE: 8/24/99

LOCATION: Offbase (AHBS) DATE INSTALLED: 8/17/99

TOTAL DEPTH (FTOC) 24.00 CASING DIAMETER 4.0

METHODS OF DEVELOPMENT

☐ Swabbing ☐ Bailing ☒ Pumping ☐ Describe surge & purge w/ well development pump

Equipment decontaminated prior to development ☒ Yes ☐ NO

Describe Alcanox, double rinse, dI rinse

EQUIPMENT NUMBERS:

pH Meter _____ EC Meter _____ Turbidity Meter _____ Thermometer _____

CASING VOLUME INFORMATION:

Casing ID (inch)	1.0	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (A) (gal/ft)	0.04	0.09	0.16	0.2	0.37	0.65	0.75	1.0	1.5	2.0	2.6

PURGING INFORMATION:

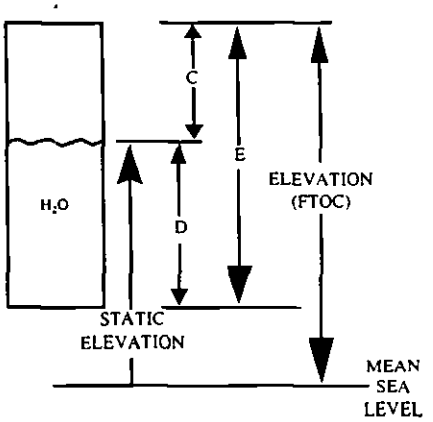
Measured Well Depth (B) 24.00 ft.

Measured Water Level Depth (C) 15.73 ft.

Length of Static Water Colume (D) _____ (B) - _____ (C) = _____ ft.

Casing Water Volume (E) + _____ (A) x _____ (D) = _____ gal

Total Purge Volume = _____ (gal)



Date	Time	Water Level (FTOC)	Volume Removed (gal)	pH	(µhmos) EC	Temperature F or C	Turbidity/ Sand (ppm)	DO (mg/L)	ORP	Comments
8/24/99	0827									surge for 10mm
8/24/99	0841	15.73	0							start pumping, very silt, (2.5L/min)
	0855		10							stop pumping to fix pump
	0920		10							Resume pumping (1.2L/mm)
	0950	15.750	20.0							surge
	0958	15.75	26.0							Reset pump rate to 0.4L/mm
	1000	15.75	26.5	6.24	798	21.84	1000+	5.11	198.2	very silty
	1005	15.75	27.0	6.25	797	21.77	1000+	4.64	194.9	very silty
	1010	15.75	28.0	6.30	797	21.71	1000+	4.55	192.8	very silty
	1015	15.75	29.0	6.34	794	21.48	1000+	4.42	189.9	very silty

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HYDRO GeoLogic INC.

WELL DEVELOPMENT RECORD

WELL/PIEZOMETER ID GWHGLRW017
SHEET 2 of _____

PROJECT NAME: _____ PROJECT NO.: AFCEE1-19CCA DATE: 8/24/99

LOCATION: _____ DATE INSTALLED: _____

TOTAL DEPTH (FTOC) _____ CASING DIAMETER _____

METHODS OF DEVELOPMENT

☐ Swabbing ☐ Bailing ☐ Pumping ☐ Describe _____

Equipment decontaminated prior to development ☐ Yes ☐ NO

Describe _____

EQUIPMENT NUMBERS:

pH Meter _____ EC Meter _____ Turbidity Meter _____ Thermometer _____

CASING VOLUME INFORMATION:

Casing ID (inch)	1.0	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (A) (gal/ft)	0.04	0.09	0.16	0.2	0.37	0.65	0.75	1.0	1.5	2.0	2.6

PURGING INFORMATION:

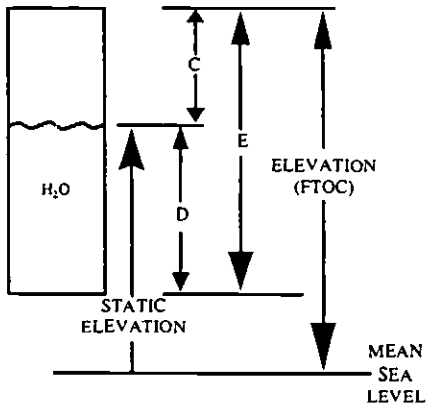
Measured Well Depth (B) _____ ft.

Measured Water Level Depth (C) _____ ft.

Length of Static Water Colume (D) _____ - _____ = _____ ft.
(B) (C)

Casing Water Volume (E) + _____ x _____ = _____ gal
(A) (D)

Total Purge Volume = _____ (gal)



Date	Time	Water Level (FTOC)	Volume Removed (gal)	pH	EC	Temperature F or C	Turbidity/ Sand (ppm)	DO	ORP Comments		
8/24/99	1020	15.75	29.75	6.38	797	21.64	1000+	4.32	181.5	very silty	
	1025	15.75	30.05	6.37	797	21.62	1000+	4.24	185.7	silty	
	1030	15.75	31.0	6.39	797	21.68	274.0	4.19	183.3	silty	20
	1035	15.75	31.7	6.41	795	21.47	201.0	4.09	179.2	silty	50
	1040	15.75	32.5	6.42	795	21.57	147.0	4.02	175.0	murky	40
	1045	15.75	33.25	6.43	797	21.69	107.0	3.97	174.1	murky	12
	1050	15.75	34.0	6.44	797	21.62	95.0	3.91	172.3	murky	24
	1055	15.75	34.7	6.44	796	21.61	71.0	3.83	170.9	murky	7
	1100	15.75	35.1	6.45	797	21.58	64.0	3.77	169.6	murky	16
	1105	15.75	35.7	6.45	796	21.63	48.7	3.61	169.2	murky	

AFCEE FORM WD.0

HYDRO GeoLogic INC.

WELL DEVELOPMENT RECORD

WELL/PIEZOMETER ID WH6LAW017
SHEET 3 of _____

PROJECT NAME: _____ PROJECT NO.: _____ DATE: _____

LOCATION: _____ DATE INSTALLED: _____

TOTAL DEPTH (FTOC) _____ CASING DIAMETER _____

METHODS OF DEVELOPMENT

☐ Swabbing ☐ Bailing ☐ Pumping ☐ Describe _____

Equipment decomtaminated prior to development ☐ Yes ☐ NO

Describe _____

EQUIPMENT NUMBERS:

pH Meter _____ EC Meter _____ Turbidity Meter _____ Thermometer _____

CASING VOLUME INFORMATION:

Casing ID (inch)	1.0	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (A) (gal/ft)	0.04	0.09	0.16	0.2	0.37	0.65	0.75	1.0	1.5	2.0	2.6

PURGING INFORMATION:

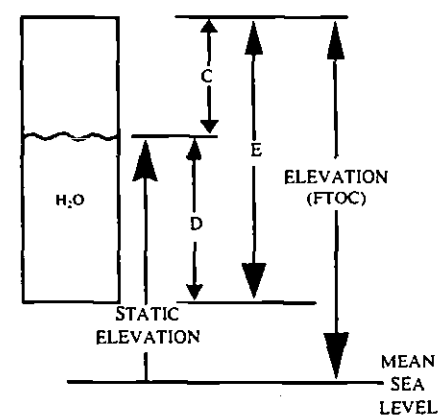
Measured Well Depth (B) _____ ft.

Measured Water Level Depth (C) _____ ft.

Length of Static Water Colume (D) _____ - _____ = _____ ft.
(B) (C)

Casing Water Volume (E) + _____ x _____ = _____ gal
(A) (D)

Total Purge Volume = _____ (gal)



Date	Time	Water Level (FTOC)	Volume Removed (gal)	pH	EC	Temperature F or C	Turbidity/ Sand (ppm)	DO mg/L	ORP Comments	
8/24/99	1110	15.75	36.5	6.45	794	21.55	35.3	3.45	168.6	
	1115	15.75	37.2	6.46	791.0	21.33	32.1	3.31	168.3	
	1120	15.75	38.0	6.45	793.0	21.49	25.2	3.41	165.8	
	1125	15.75	38.8	6.46	790	21.30	21.0	3.45	164.4	
	1130	15.75	39.4	6.45	794	21.52	15.5	3.49	162.6	
	1135	15.75	40.01	6.45	792	21.41	19.9	3.44	160.8	
	1140	15.75	40.9	6.45	793	21.50	45.0	3.43	160.0	
	1145	15.75	41.5	6.45	793	21.48	20.0	3.42	158.9	
	1150	15.75	42.5	6.45	792	21.45	9.7	3.37	157.8	
	1155	15.75	43.7	6.45	791	21.38	9.2	3.34	156.8	

13
3
7

524 223

HYDRO GeoLogic INC.

WELL DEVELOPMENT RECORD

WELL/PIEZOMETER ID WH6WW017
SHEET 4 of 4

PROJECT NAME: _____ PROJECT NO. : AFCEE1-19CCA DATE: 8/24/99

LOCATION: _____ DATE INSTALLED: _____

TOTAL DEPTH (FTOC) _____ CASING DIAMETER _____

METHODS OF DEVELOPMENT

☐ Swabbing ☐ Bailing ☐ Pumping ☐ Describe _____

Equipment decomtaminated prior to development ☐ Yes ☐ NO

Describe _____

EQUIPMENT NUMBERS:

pH Meter _____ EC Meter _____ Turbidity Meter _____ Thermometer _____

CASING VOLUME INFORMATION:

Casing ID (inch)	1.0	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (A) (gal/ft)	0.04	0.09	0.16	0.2	0.37	0.65	0.75	1.0	1.5	2.0	2.6

PURGING INFORMATION:

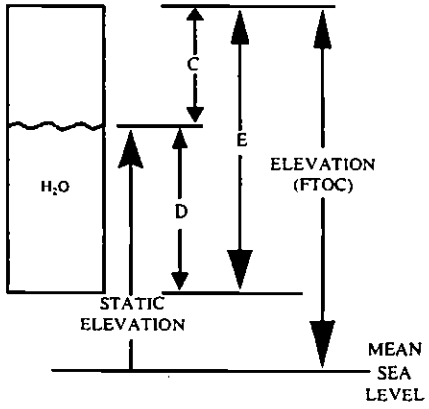
Measured Well Depth (B) _____ ft.

Measured Water Level Depth (C) _____ ft.

Length of Static Water Colume (D) _____ - _____ = _____ ft.
(B) (C)

Casing Water Volume (E) + _____ x _____ = _____ gal
(A) (D)

Total Purge Volume = _____ (gal)



Date	Time	Water Level (FTOC)	Volume Removed (gal)	pH	EC	Temperature F or C	Turbidity/ Sand (ppm)	DO mg/L	ORP	Comments
	1200	15.75	44.0	6.44	790	21.43	6.8	3.28	159.3	
	1205	15.75	44.8	6.44	793	21.56	6.2	3.29	159.1	
	1210	15.75	45.3	6.45	792	21.50	5.5	3.28	157.6	
	1215	15.75	44.9	6.45	790	21.38	4.8	3.24	155.1	
	1220	15.75	45.2	6.45	791	21.48	4.8	3.25	153.9	Parameters stabilized

AFCEE FORM WD.0

524 224

HYDRO GeoLogic Inc.

WELL DEVELOPMENT RECORD

WELL/PIEZOMETER ID WH6RW018
SHEET 1 of 2

PROJECT NAME: WAS Fort Worth RD PROJECT NO.: AF1001-19CCA DATE: 6/28/99

LOCATION: DFC base DATE INSTALLED:

TOTAL DEPTH (FTOC) 26.74 CASING DIAMETER 4.0"

METHODS OF DEVELOPMENT

☐ Swabbing ☐ Bailing ☒ Pumping ☐ Describe

Equipment decontaminated prior to development ☐ Yes ☐ NO

Describe

EQUIPMENT NUMBERS:

pH Meter EC Meter Turbidity Meter Thermometer

CASING VOLUME INFORMATION:

Casing ID (inch)	1.0	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (A) (gal/ft)	0.04	0.09	0.16	0.2	0.37	0.65	0.75	1.0	1.5	2.0	2.6

PURGING INFORMATION:

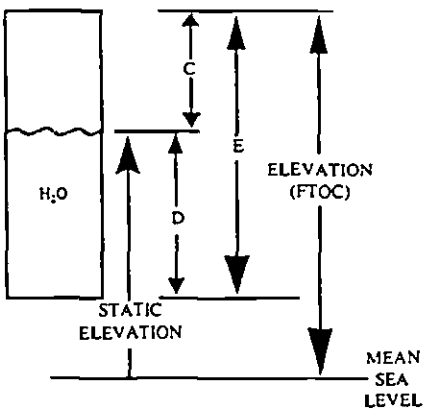
Measured Well Depth (B) 26.74 ft.

Measured Water Level Depth (C) 16.86 ft.

Length of Static Water Colume (D) _____ (B) - _____ (C) = _____ ft.

Casing Water Volume (E) + _____ (A) x _____ (D) = _____ gal

Total Purge Volume = _____ (gal)



Date	Time	Water Level (FTOC)	Volume Removed (gal)	pH	EC	Temperature F or C	Turbidity/ Sand (ppm)	D.O.	ORP	Comments
6/28/99	1627	16.86	0	Start pumping after 7 minutes of surging w/ dev. pump.						
	1640	16.94	15					very silty		
	1650	16.94	23.0					very silty		
	1705	below pump	32.0					hung pump at. surged for 5 minutes, very silty.		
	1722	below pump	38.0					surged for 5 minutes very silty		
	1750	below pump	45.0							
	1800	below pump								
	1807	below pump	47.0	6.35	665	20.68	1115	1.70	166.7	very silty
	1815	below pump	50	6.35	664	20.67	328	1.76	178.9	~~very~~ silty 0.94/min
	1820	"	53	6.34	664	20.67	153.7	1.81	180.8	

AFCEE FORM WD.0

524 225

HYDRO GeoLogic INC.

WELL DEVELOPMENT RECORD

WELL/PIEZOMETER ID WHGCRW01B
SHEET 2 of 2

PROJECT NAME: NAS Fairchild TRB PROJECT NO.: AFC001-18CCA DATE: 6/28/98

LOCATION: Offbase DATE INSTALLED: _____

TOTAL DEPTH (FTOC) _____ CASING DIAMETER _____

METHODS OF DEVELOPMENT

☐ Swabbing ☐ Bailing ☐ Pumping ☐ Describe _____

Equipment decontaminated prior to development ☐ Yes ☐ NO

Describe _____

EQUIPMENT NUMBERS:

pH Meter _____ EC Meter _____ Turbidity Meter _____ Thermometer _____

CASING VOLUME INFORMATION:

Casing ID (inch)	1.0	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (A) (gal/ft)	0.04	0.09	0.16	0.2	0.37	0.65	0.75	1.0	1.5	2.0	2.6

PURGING INFORMATION:

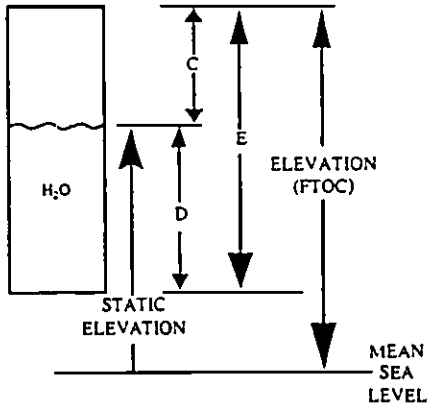
Measured Well Depth (B) _____ ft.

Measured Water Level Depth (C) _____ ft.

Length of Static Water Colume (D) _____ (B) - _____ (C) = _____ ft.

Casing Water Volume (E) + _____ (A) x _____ (D) = _____ gal

Total Purge Volume = _____ (gal)



Date	Time	Water Level (FTOC)	Volume Removed (gal)	pH	EC	Temperature F or C	Turbidity/ Sand (ppm)	DO mg/L	ORP Comments	
6/28/98	1830	below pump	54.0	6.34	664	20.63	86.4	1.76	194.5	stirry/cloudy
	1835	below pump	55.5	6.35	663	20.61	64.3	1.79	197.3	
	1840	below pump	56.5	6.34	662	20.55	64.4	1.81	200.8	
	1845	below pump	57.0	6.35	661	20.58	58.4	1.84	203.3	
	1850	below pump	59.0	6.35	664	20.58	62.2	1.78	204.3	Stop pumping parameters stabilized

AFCEE FORM WD.0

HYDRO GeoLogic INC.

WELL DEVELOPMENT RECORD

WELL/PIEZOMETER ID WHGLRW019
SHEET 1 of 2

PROJECT NAME: NAS Fort Worth JRB PROJECT NO.: AFCEE-19CCA DATE: 6/28/99

LOCATION: OAK bay DATE INSTALLED:

TOTAL DEPTH (FTOC) 23.68 CASING DIAMETER 4.0"

METHODS OF DEVELOPMENT

☐ Swabbing ☐ Bailing ☒ Pumping ☒ Describe well development pump (surge & purge)

Equipment decontaminated prior to development ☒ Yes ☐ NO

Describe Alconox, double rinse

EQUIPMENT NUMBERS:

pH Meter _____ EC Meter _____ Turbidity Meter _____ Thermometer _____

CASING VOLUME INFORMATION:

Casing ID (inch)	1.0	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (A) (gal/ft)	0.04	0.09	0.16	0.2	0.37	0.65	0.75	1.0	1.5	2.0	2.6

PURGING INFORMATION:

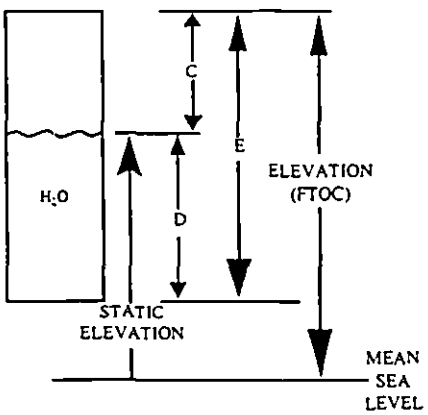
Measured Well Depth (B) 23.68 ft.

Measured Water Level Depth (C) 13.86 ft.

Length of Static Water Colume (D) _____ (B) - _____ (C) = _____ ft.

Casing Water Volume (E) + _____ (A) x _____ (D) = _____ gal

Total Purge Volume = _____ (gal)



Date	Time	Water Level (FTOC)	Volume Removed (gal)	pH	EC	Temperature F or C	Turbidity/ Sand (ppm)	D.O.	ORP Comments	Comments
6/28/99	0850	13.86	Surge well for 5 minutes using development pump							
	0855		Start pumping					very silty (3L/min)		
	0920		15 gal	→				very silty		
	0938		25 gal	Stop pumping to adjust pump.						
	0956		Resume pumping.							
	1020	14.02	42.0 gal	→				Reduce flow rate to 1 L/min, silty		
	1028	14.01	44.0	6.46	699	20.64	944	4.34	298.1	very cloudy
	1033	13.96	50.0	6.47	698	20.65	1251	4.05	299.0	very cloudy
	1038	13.93	52.0	6.44	698	20.68	1390	3.72	300.1	very cloudy
	1043	13.95	53.5	6.44	697	20.64	651	3.66	300.1	very cloudy

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HYDRO GeoLogic INC.

WELL DEVELOPMENT RECORD

WELL/PIEZOMETER ID GW16LRW019
SHEET 2 of 2

PROJECT NAME: NAS Fort Worth JRB PROJECT NO.: NAS Fort AFCEE-MCA DATE: 6/28/97

LOCATION: Old base DATE INSTALLED:

TOTAL DEPTH (FTOC) CASING DIAMETER 4.0

METHODS OF DEVELOPMENT

☐ Swabbing ☐ Bailing ☐ Pumping ☐ Describe

Equipment decontaminated prior to development ☐ Yes ☐ NO

Describe

EQUIPMENT NUMBERS:

pH Meter EC Meter Turbidity Meter Thermometer

CASING VOLUME INFORMATION:

Casing ID (inch)	1.0	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (A) (gal/ft)	0.04	0.09	0.16	0.2	0.37	0.65	0.75	1.0	1.5	2.0	2.6

PURGING INFORMATION:

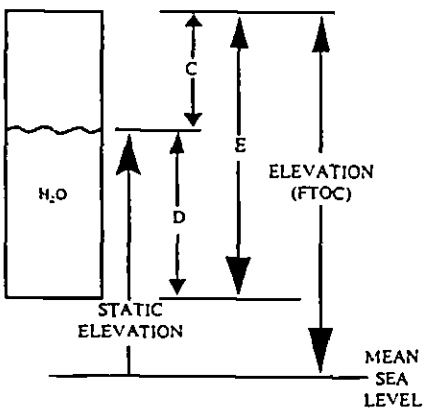
Measured Well Depth (B) ft.

Measured Water Level Depth (C) ft.

Length of Static Water Colume (D) (B) - (C) = ft.

Casing Water Volume (E) + (A) x (D) = gal

Total Purge Volume = (gal)



Date	Time	Water Level (FTOC)	Volume Removed (gal)	pH	EC	Temperature F or (C)	Turbidity/ Sand (ppm)	DO mg/L	ORP	Comments
6/28/97	1053	13.93	55.0	6.43	697	20.61	~~697~~/181	3.68	302.3	1 L/min
	1058	13.94	62.0	6.43	696	20.67	81.0	3.72	302.8	
	1103	13.93	64.0	6.44	696	20.64	53.9	3.73	302.7	
	1108	13.96	65.0	6.44	696	20.60	35.9	3.75	304.1	
	1113	13.96	66.5	6.45	695	20.59	23.7	3.78	304.4	
	1118	13.93	67.5	6.45	695	20.57	15.80	3.80	304.1	
	1123	13.95	68.5	6.45	695	20.59	12.42	3.80	303.9	
	1126	13.96	69.5	6.45	695	20.61	10.55	3.81	303.9	
	1129	13.94	70.0	6.45	695	20.61	9.90	3.82	304.0	
	1132	13.96	70.7	6.45	695	20.63	9.24	3.83	304.1	
	1135	13.95	71.5	6.44	695	20.60	8.28	3.83	303.7	stop pumping parameters stabilized.

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WELL DEVELOPMENT RECORD

WELL/PIEZOMETER ID WHGLT4~~020~~ 020
SHEET 1 of 2

PROJECT NAME: NAS Fort Worth JRB PROJECT NO.: AFC 001-~~05~~19 CCA DATE: 6/30/99

LOCATION: Off Base DATE INSTALLED:

TOTAL DEPTH (FTOC) 14.90 CASING DIAMETER ~~4"~~ 2"

METHODS OF DEVELOPMENT

☐ Swabbing ☐ Bailing ☐ Pumping ☑ Describe Purge and Surge

Equipment decontaminated prior to development ☐ Yes ☐ NO

Describe

EQUIPMENT NUMBERS:

pH Meter _____ EC Meter _____ Turbidity Meter _____ Thermometer _____

CASING VOLUME INFORMATION:

Casing ID (inch)	1.0	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (A) (gal/ft)	0.04	0.09	0.16	0.2	0.37	0.65	0.75	1.0	1.5	2.0	2.6

PURGING INFORMATION:

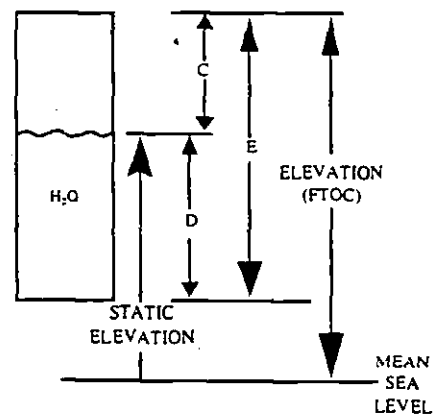
Measured Well Depth (B) 14.90 ft.

Measured Water Level Depth (C) 11.38 ft.

Length of Static Water Colume (D) 14.90 (B) - 11.38 (C) = 3.52 ft.

Casing Water Volume (E) = 0.16 (A) x 3.52 (D) = 0.563 gal

Total Purge Volume = _____ (gal)



Date	Time	Water Level (FTOC)	Volume Removed (gal)	pH	EC	Temperature F or C	Turbidity/ Sand (ppm)	DO (mg/L) ~~Comments~~	ORP (mV)
6/30/99	1640	Below top of pump	15.0	6.44	931	22.60	1000+	3.26	221.2
	1645		15.5	6.38	898	20.99	815	3.17	236.4
	1650		16.0	6.37	902	21.38	1600	3.12	242.9
	1700		16.5	6.38	896	21.04	1572	3.07	251.6
	1710		17.0	6.37	888	20.72	~~1000+~~ 1300	3.07	254.4
	1720		17.5	6.39	889	20.76	1056	3.16	256.5
	1740		~~18.0~~ 18.5	6.40	885	20.77	740	3.18	254.9
	1750		~~18.5~~ 19.0	6.40	885	20.77	624	3.20	255.5
	1800		19.5	6.42	882	20.65	375	3.27	255.5
	1810		20.0	6.41	879	20.64	264	3.24	255.0

(Begins purging well at 1430)

AFCEE FORM WD.0

524 229

020 G

WELL DEVELOPMENT RECORD

WELL/PIEZOMETER ID WHGCTA ~~020~~
SHEET 2 of 2

PROJECT NAME: _____ PROJECT NO.: AFC001-19CCA DATE: 6/30/99

LOCATION: _____ DATE INSTALLED: _____

TOTAL DEPTH (FTOC) _____ CASING DIAMETER _____

METHODS OF DEVELOPMENT

☐ Swabbing ☐ Bailing ☐ Pumping ☐ Describe _____

Equipment decomtaminated prior to development ☐ Yes ☐ NO

Describe _____

EQUIPMENT NUMBERS:

pH Meter _____ EC Meter _____ Turbidity Meter _____ Thermometer _____

CASING VOLUME INFORMATION:

Casing ID (inch)	1.0	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (A) (gal/ft)	0.04	0.09	0.16	0.2	0.37	0.65	0.75	1.0	1.5	2.0	2.6

PURGING INFORMATION:

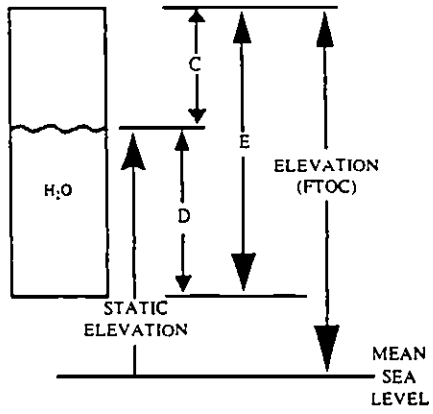
Measured Well Depth (B) _____ ft.

Measured Water Level Depth (C) _____ ft.

Length of Static Water Colume (D) _____ (B) - _____ (C) = _____ ft.

Casing Water Volume (E) = _____ (A) x _____ (D) = _____ gal

Total Purge Volume = _____ (gal)



Date	Time	Water Level (FTOC)	Volume Removed (gal)	pH	EC	Temperature F or C	Turbidity/ Sand (ppm)	DO (mg/L)	Comments	ORP (mV)
6/30	1820		20.5	6.40	877	20.54	182.0	3.27		256.5
	1830		21.0	6.42	881	20.75	436	3.33		256.9
	1840		21.5	6.44	876	20.40	705	3.24		259.3
	1850		~~20.41~~ 22	6.44	875	20.44	377	3.26		259.3
	1900		22.5	6.43	876	20.44	210	3.27		259.9
	1910		23.0	6.43	874	20.40	177	3.26		260.5
	1920		23.5	6.44	875	20.49	130	3.24		262.5
	1930		24.0	6.44	871	20.26	95	3.23		263.1
	1940		24.5	6.45	871	20.30	99.1	3.21		265.4
	1950		25.0	6.46	872	20.35	102	3.20		267.2

1955 Stop purging, parameters stabilized.

AFCEE FORM WD.0

HYDRO GeoLogic INC.

WELL DEVELOPMENT RECORD

WELL/PIEZOMETER ID LW46LTA022
SHEET 1 of 2

PROJECT NAME: NAS Fort Worth JRB PROJECT NO.: AFC001-19CCA DATE: 6/29/99

LOCATION: Off base DATE INSTALLED:

TOTAL DEPTH (FTOC) 32.50 CASING DIAMETER 2.0 inch

METHODS OF DEVELOPMENT

☐ Swabbing ☐ Bailing ☒ Pumping ☐ Describe

Equipment decontaminated prior to development ☐ Yes ☐ NO

Describe Alconox, double rinse

EQUIPMENT NUMBERS:

pH Meter _____ EC Meter _____ Turbidity Meter _____ Thermometer _____

CASING VOLUME INFORMATION:

Casing ID (inch)	1.0	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (A) (gal/ft)	0.04	0.09	0.16	0.2	0.37	0.65	0.75	1.0	1.5	2.0	2.6

PURGING INFORMATION:

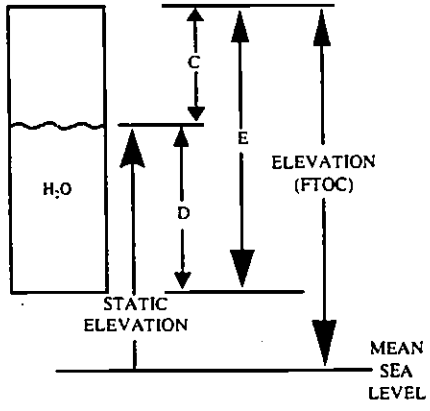
Measured Well Depth (B) 32.5 ft.

Measured Water Level Depth (C) 21.88 ft.

Length of Static Water Colume (D) _____ (B) - _____ (C) = _____ ft.

Casing Water Volume (E) = _____ (A) x _____ (D) = _____ gal

Total Purge Volume = _____ (gal)



Date	Time	Water Level (FTOC)	Volume Removed (gal)	pH	EC	Temperature F or C	Turbidity/ Sand (ppm)	DO	ORP	Comments
6/29	0834	21.88	0	Start pumping after surging for 7 minutes, very silty						
	0905	21.91	20	→			→	very silty, ~2.7 L/min, surge 5 min		
	0935	21.93	35	→			→	beginning to clear, very silty		
	0948	21.90	~~50~~ 55	6.46	671	20.35	1096	5.66	294.0	very silty, 1.2 L/min
	0955	21.89	52.0	6.47	671	20.33	812	5.68	294.6	
	1000	21.89	54.0	6.47	671	20.36	527	5.71	294.0	
	1005	21.89	55.0	6.48	673	20.42	395	5.75	291.5	
	1010	21.89	56.5	6.47	672	20.39	360	5.75	291.3	
	1020	21.89	60.0	6.48	672	20.40	627	5.74	288.6	surge for 5 minutes
	1220	Continues to be very silty and fluctuates between 300-600 NTUs								

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HYDRO GeoLogic INC.

WELL DEVELOPMENT RECORD

WELL/PIEZOMETER ID: WHGLTA02-3
SHEET 2 of 2

PROJECT NAME: NAS Fort Worth PROJECT NO.: AFCEE1-17CA DATE: 6/29/99

LOCATION: OYF-bar DATE INSTALLED: _____

TOTAL DEPTH (FTOC) 32.50 CASING DIAMETER 2.0

METHODS OF DEVELOPMENT

☐ Swabbing ☐ Bailing ☐ Pumping ☐ Describe _____

Equipment decontaminated prior to development ☐ Yes ☐ NO

Describe _____

EQUIPMENT NUMBERS:

pH Meter _____ EC Meter _____ Turbidity Meter _____ Thermometer _____

CASING VOLUME INFORMATION:

Casing ID (inch)	1.0	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (A) (gal/ft)	0.04	0.09	0.16	0.2	0.37	0.65	0.75	1.0	1.5	2.0	2.6

PURGING INFORMATION:

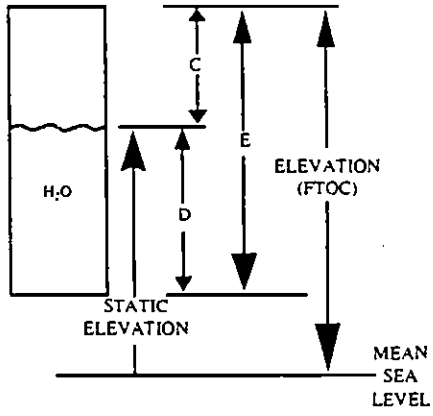
Measured Well Depth (B) _____ ft.

Measured Water Level Depth (C) _____ ft.

Length of Static Water Colume (D) _____ (B) - _____ (C) = _____ ft.

Casing Water Volume (E) = _____ (A) x _____ (D) = _____ gal

Total Purge Volume = _____ (gal)



Date	Time	Water Level (FTOC)	Volume Removed (gal)	pH	EC	Temperature F or C	Turbidity/ Sand (ppm)	D.O.	ORP Comments	
6/29/99	1300	21.89	109	6.57	697	21.96	130	5.73	267.6	0.54 mM
6/29/99	1310	21.89	100	6.57	694	21.83	91.8	5.95	270.1	
	1315	21.89	103	6.53	690	21.49	59.8	5.85	273.3	
	1320	21.89	104	6.52	691	21.64	44.1	5.83	275.9	
	1325	21.88	105	6.51	692	21.70	36.1	5.83	277.8	
	1330	21.88	105.5	6.49	693	21.77	28.5	5.81	277.0	
	1335	21.89	106.5	6.51	709	23.95	22.9	5.90	271.8	
	1340	21.89	106.9	6.48	697	22.02	23.6	5.99	268.7	
	1345	21.89	107.3	6.49	704	22.45	21.4	5.77	265.0	Parameters stabilized

AFCEE FORM WD.0

P.O. 19

524 232

HYDRO GeoLogic Inc.

WELL DEVELOPMENT RECORD

WELL/PIEZOMETER ID LTAC23
SHEET 1 of 3

PROJECT NAME: LASF-LCOM/TAC PROJECT NO.: ARCO-19CCA DATE: 6/24/99

LOCATION: Off Base DATE INSTALLED: 6/17/99

TOTAL DEPTH (FTOC) 28.58 CASING DIAMETER 2"

METHODS OF DEVELOPMENT

☐ Swabbing ☐ Bailing ☒ Pumping ☐ Describe pump w/surge rings

Equipment decontaminated prior to development ☒ Yes ☐ NO

Describe alconox rinse plus double rinse

EQUIPMENT NUMBERS:

~~pH Meter~~ 2016281R EC Meter _____ Turbidity Meter 806125 Thermometer _____

well wizard

CASING VOLUME INFORMATION:

Casing ID (inch)	1.0	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (A) (gal/ft)	0.04	0.09	0.16	0.2	0.37	0.65	0.75	1.0	1.5	2.0	2.6

PURGING INFORMATION:

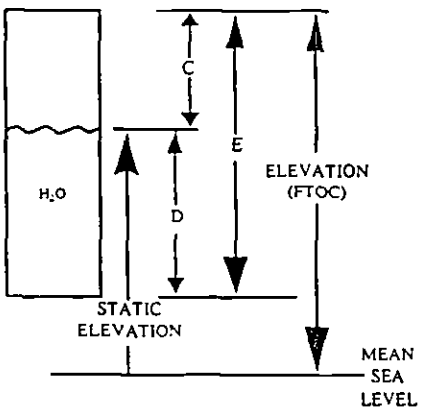
Measured Well Depth (B) 28.58 ft.

Measured Water Level Depth (C) 16.39 ft.

Length of Static Water Colume (D) 28.58 (B) - 16.39 (C) = 12.19 ft.

Casing Water Volume (E) + _____ (A) x _____ (D) = _____ gal

Total Purge Volume = _____ (gal)



Date	Time	Water Level (FTOC)	Volume Removed ~~gal~~ (gal)	pH	EC	Temperature F or C	Turbidity/ Sand (ppm)	Comments
6/24/99	1405	16.39	0					Start pumping surge 10 minutes
	1447		13					Stop pumping surge for 5 minutes
	1453		13					Continue pumping, very cloudy water
	1455	Stop pumping to repair pump						
	1525	Resume pumping						
	1532	Stop pumping. Surge for 5 minutes						
	1535	Resume pumping very cloudy water						
	1600		30	6.45	643	20.16	1489	
	1605		~~35~~ 31	6.45	641	20.12	1355	
	1610		~~40~~ 32	6.46	641	20.13	1021	

AFCEE FORM WD.0

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HYDRO GeoLogic INC.

WELL DEVELOPMENT RECORD

WELL/PIEZOMETER ID WMGLTA023
SHEET 2 of 3

PROJECT NAME: NAS Fort Worth PROJECT NO.: AFC001-19CCH DATE: 6/24/99

LOCATION: Off Base DATE INSTALLED: 6/17/99

TOTAL DEPTH (FTOC) 28.52 CASING DIAMETER 2"

METHODS OF DEVELOPMENT

☐ Swabbing ☐ Bailing ☒ Pumping ☐ Describe pump w/ surge rings

Equipment decontaminated prior to development ☐ Yes ☐ NO

Describe Alconox + 2 rinse

EQUIPMENT NUMBERS:

~~pH Meter~~ 206281R ~~EC Meter~~ _____ Turbidity Meter 806125 ~~Thermometer~~ _____

well wizard

CASING VOLUME INFORMATION:

Casing ID (inch)	1.0	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (A) (gal/ft)	0.04	0.09	0.16	0.2	0.37	0.65	0.75	1.0	1.5	2.0	2.6

PURGING INFORMATION:

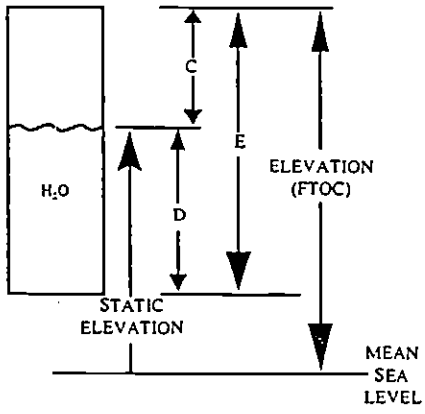
Measured Well Depth (B) 28.58 ft.

Measured Water Level Depth (C) 16.39 ft.

Length of Static Water Colume (D) 28.58 (B) - 16.39 (C) = 12.19 ft.

Casing Water Volume (E) + _____ (A) x _____ (D) = _____ gal

Total Purge Volume = _____ (gal)



Date	Time	Water Level (FTOC)	Volume Removed (gal)	pH	EC	Temperature F or C	Turbidity/ Sand (ppm)	D.O.	Comments O.R.P.
6/24	1615	16.42	33	6.47	640	20.13	718	4.75	298.4
	1620	16.42	34	6.48	640	20.22	546	4.78	299.2
	1625	16.44	35	6.49	639	20.16	458	4.77	299.9
	1630	16.45	36	6.49	638	20.14	305	4.79	300.6
	1635	16.44	37	6.49	638	20.12	141	4.82	301.4
	1640	16.44	38	6.50	637	20.10	109	4.82	301.6
	1645	16.46	39	6.51	637	20.07	60.3	4.79	301.3
	1650	16.46	40	6.50	637	20.08	59.9	4.77	301.7
	1655	16.46	41	6.51	638	20.11	58.7	4.78	299.3
✓	1700	16.50	42	6.51	638	20.08	45.0	4.77	300.1

AFCEE FORM WD.0

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HYDRO GeoLogic INC.

WELL DEVELOPMENT RECORD

WELL/PIEZOMETER ID WHGLTA023
SHEET 3 of 3

PROJECT NAME: NAS Fort Worth JRB PROJECT NO.: AFCOO1-19CEA DATE: 6/24/99

LOCATION: Off Base DATE INSTALLED: 6/17/99

TOTAL DEPTH (FTOC) _____ CASING DIAMETER 2"

METHODS OF DEVELOPMENT

☐ Swabbing ☐ Bailing ☒ Pumping ☐ Describe _____

Equipment decomtaminated prior to development ☒ Yes ☐ NO

Describe Alconox + 2 rinse

EQUIPMENT NUMBERS:

~~pH Meter~~ well wizard 206281R EC Meter _____ Turbidity Meter 806125 Thermometer _____

CASING VOLUME INFORMATION:

Casing ID (inch)	1.0	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (A) (gal/ft)	0.04	0.09	0.16	0.2	0.37	0.65	0.75	1.0	1.5	2.0	2.6

PURGING INFORMATION:

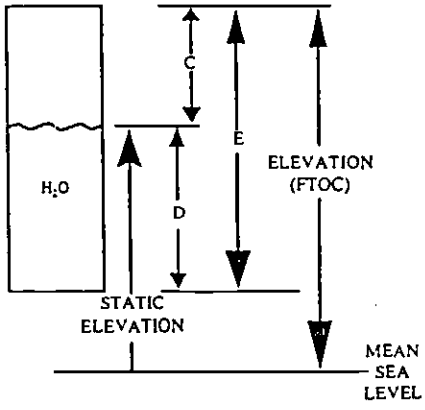
Measured Well Depth (B) _____ ft.

Measured Water Level Depth (C) _____ ft.

Length of Static Water Colume (D) _____ (B) - _____ (C) = _____ ft.

Casing Water Volume (E) + _____ (A) x _____ (D) = _____ gal

Total Purge Volume = _____ (gal)



Date	Time	Water Level (FTOC)	Volume Removed (gal)	pH	EC	Temperature F or C	Turbidity/ Sand (ppm)	D.O	Comments ORP
6/24	1705	16.50	43	6.51	638	20.11	35.4	4.79	298.5
	1710	16.49	44	6.51	637	20.07	30.0	4.79	300.1
	1715	16.49	45	6.51	637	20.08	25.7	4.76	299.1
	1720	16.50	46	6.51	637	20.04	19.0	4.77	300.6
	1725	16.50	47	6.51	637	20.09	16.4	4.78	299.4
	1730	16.45	48	6.51	638	20.13	14.6	4.78	299.9
	1735	16.46	49	6.51	637	20.06	9.9	4.79	298.6
	1738	16.46	50	6.51	637	20.04	9.8	4.79	300.1
	1741	16.45	51	6.51	638	20.08	9.4	4.78	299.4
✓	1742	Parameters stabilized stop pumping							

AFCEE FORM WD.0

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HYDRO GeoLogic INC.

WELL DEVELOPMENT RECORD

WELL/PIEZOMETER ID: WHGCTA025
SHEET 1 of 2

PROJECT NAME: NAS Fallon JRB PROJECT NO.: AFCEE01-19CCA DATE: 6/28

LOCATION: Off - Base DATE INSTALLED: _____

TOTAL DEPTH (FTOC) 21.32 CASING DIAMETER 2"

METHODS OF DEVELOPMENT

☐ Swabbing ☐ Bailing ☐ Pumping ☑ Describe Surge and Purge

Equipment decomtaminated prior to development ☐ Yes ☐ NO

Describe _____

EQUIPMENT NUMBERS:

pH Meter _____ EC Meter _____ Turbidity Meter _____ Thermometer _____

CASING VOLUME INFORMATION:

Casing ID (inch)	1.0	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (A) (gal/ft)	0.04	0.09	0.16	0.2	0.37	0.65	0.75	1.0	1.5	2.0	2.6

PURGING INFORMATION:

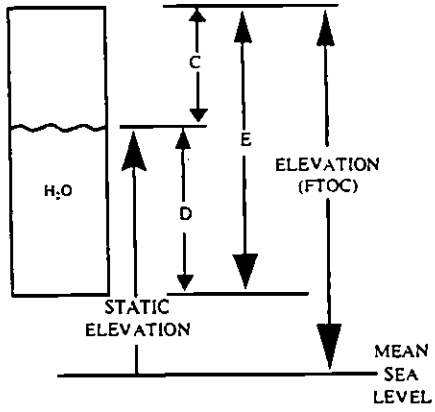
Measured Well Depth (B) 21.32 ft.

Measured Water Level Depth (C) 15.76 ft.

Length of Static Water Colume (D) 21.32 (B) - 15.76 (C) = .64 ft.

Casing Water Volume (E) = _____ (A) x _____ (D) = _____ gal

Total Purge Volume = _____ (gal)



Date	Time	Water Level (FTOC)	Volume Removed (gal)	pH	EC	Temperature F or C	Turbidity/ Sand (ppm)	DO (mg/L)	Comments ORP
6/29 ~~6/28~~	1645	15.76	0	Start pumping after surging for 5 minutes					
6/29	1800	Water level is below to pump	20	6.89	577	20.94	704	3.47	109.9
	1805		25	6.60	586	20.37	183	3.47	135.8
	1810		28 ~~20~~	6.54	588	20.30	79.3	3.37	156.5
	1815		30	6.54	588	20.28	25.3	3.35	168.4
	1820		32	6.55	588	20.30	16.1	3.32	175.1
	1825		34	6.56	588	20.26	15.4	3.30	182.2
	1830		36	6.57	588	20.29	32.1	3.28	188.3
	1835		38	6.60	581	20.51	31.1	3.34	195.3
	1840		40	6.61	581	20.45	16.6	3.17	198

HYDRO GeoLogic INC.

WELL DEVELOPMENT RECORD

WELL/PIEZOMETER ID WHGLTA025
SHEET 2 of 2

PROJECT NAME: _____ PROJECT NO. : _____ DATE: _____

LOCATION: _____ DATE INSTALLED: _____

TOTAL DEPTH (FTOC) _____ CASING DIAMETER _____

METHODS OF DEVELOPMENT

☐ Swabbing ☐ Bailing ☐ Pumping ☐ Describe _____

Equipment decomtaminated prior to development ☐ Yes ☐ NO

Describe _____

EQUIPMENT NUMBERS:

pH Meter _____ EC Meter _____ Turbidity Meter _____ Thermometer _____

CASING VOLUME INFORMATION:

Casing ID (inch)	1.0	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (A) (gal/ft)	0.04	0.09	0.16	0.2	0.37	0.65	0.75	1.0	1.5	2.0	2.6

PURGING INFORMATION:

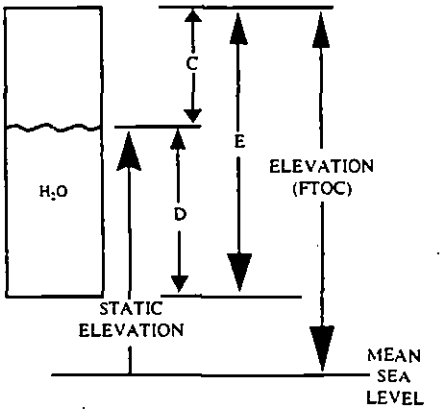
Measured Well Depth (B) _____ ft.

Measured Water Level Depth (C) _____ ft.

Length of Static Water Colume (D) _____ (B) - _____ (C) = _____ ft.

Casing Water Volume (E) = _____ (A) x _____ (D) = _____ gal

Total Purge Volume = _____ (gal)



Date	Time	Water Level (FTOC)	Volume Removed (gal)	pH	EC	Temperature F or C	Turbidity/ Sand (ppm)	DO [mg/L]	ORP Comments
6/27/11	1845		42	6.61	587	20.45	7.3	3.26	202.1
	1850		44	6.62	589	20.45	4.6	3.32	205.7
	1855		46	6.62	591	20.49	3.5	3.34	208.0
	1856		Stop	bleeding well					

AFCEE FORM WD.0

APPENDIX C.4
1999 SOUTHERN LOBE TCE PLUME DELINEATION GROUNDWATER FIELD SAMPLING DATA SHEETS

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: WHGLRW015	Site: NAS Fort Worth July 1999 Quarterly Sampling
Sampler(s): Brad Nielsen, John Dofford	Project No: AFC-001-~~26 HAA~~ 19CCD (20)
Well Depth: 23.11	Date: 7/28/99 Time: 1548
DTW (ft): 14.46 DTP (ft): –	Courier: _X_FedEx ____UPS ____Hand ____Other
MP Ht. Above/Below Ground Surface:	Sampling Method (G=grab, B=bailer, SP=submersible pump): SP
Condition of Bottom of Well: good	Type of Pump: Bladder
Screen Interval (ft): 13.11-23.11	Weather (sun/clear, overcast/rain, wind direction, ambient temperature): sunny, hot (100°), breezy (N)
Well Diameter (in): 4.0	
Placement of Pump (ft): 19.0'	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/min) ~~(gpm)~~	Total Volume (L) ~~(gal)~~	pH	Temp. (C)	Cond. (umhos/cm)	ORP (mV)	DO (mg/L)	Turb. (NTU)	Type, Size, and Amount of Sediment Discharged
1548	14.46	0.2	0	Begin	Pumping				40(20)	
1551	14.46	0.2	0.6	6.45	25.41	901.0	254.4	3.20	40.5	Clear
1554	14.46	0.2	1.2	6.44	25.03	889.0	253.7	3.10	27.0	Clear
1557	14.46	0.2	1.8	6.42	24.20	878.0	249.0	2.94	26.5	Clear
1600	14.46	0.2	2.4	6.40	23.87	872.0	245.1	2.89	25.5	Clear
1603	14.46	0.2	3.0	6.36	23.56	866.0	240.4	2.85	25.6	Clear
1606	14.46	0.2	3.6	6.32	23.05	857.0	233.8	2.80	27.4	Clear

Observations

Color: (Clear) Other (describe):
Odor: (None) Low Medium High Very Strong H2S Fuel-like
Sample Parameters: VOCs
Notes:
Signed/Sampler(s): [signature]

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: ~~W46LRW01~~ W46LRW017	Site: NASFW TCE Plume Investigation
Sampler(s): Brad Nielsen, John Ostford	Project No: AFC-001-19 CCD
Well Depth: 23.98	Date: 8/26/99 Time: 1520
DTW (ft): 15.77 DTP (ft): —	Courier: X FedEx ~~X~~ UPS ___Hand ___Other
MP Ht. Above/Below Ground Surface:	Sampling Method (G=grab, B=bailer, SP=submersible pump) SP
Condition of Bottom of Well: good/some silt	Type of Pump: Bladder
Screen Interval (ft): 13.9 - 23.9	Weather (sun/clear, overcast/rain, wind direction, ambient temperature):
Well Diameter (in): 4.0	sunny, wind out of SW, 101°F
Placement of Pump (ft): 20.0	

Field Parameters

Time	Depth to Water (ft)	Flow Rate ~~(gpm)~~ mM	Total Volume ~~(gal)~~ L	pH	Temp. (C)	Cond. (umhos/cm)	ORP	DO (mg/L)	Turb. (NTU)	Type, Size, and Amount of Sediment Discharged
1520	15.77	0.25	0							Start pumping
1523	15.78	0.25	0.75	6.65	23.83	687	171.2	4.76	115.4	murky
1526	15.78	0.25	1.5	6.62	23.58	682	171.1	4.53	72.7	murky
1529	15.78	0.25	2.25	6.61	23.60	678	170.3	4.47	79.0	murky
1532	15.78	0.25	3.0	6.61	23.72	679	161.9	4.64	69.6	murky
1535	15.78	0.25	3.75	6.60	23.62	678	167.2	4.51	62.8	murky
1538	15.78	0.25	4.50	6.59	23.50	676.0	168.4	4.54	60.4	murky
1541	15.78	0.25	5.25	6.59	23.75	678	169.0	4.57	55.2	clear
1544	15.78	0.25	6.0	6.59	23.89	682	169.2	4.58	50.1	clear
1547	15.78	0.25	6.75	6.58	23.34	674	169.6	4.59	48.5	clear
1550	15.78	0.25	7.50	6.58	23.12	672	169.4	4.66	44.6	clear
1553	15.78	0.25	8.25	6.59	24.09	668	169.7	4.65	41.3	clear
1556	15.78	0.25	9.0	6.59	23.84	669	170.1	4.78	38.5	clear
1559	15.78	0.25	9.75	6.59	24.12	671	165.9	4.76	36.6	clear
1602	15.78	0.25	10.50	6.59	23.97	680	169.1	4.76	34.1	clear
1605	15.78	0.25	11.25	6.59	23.80	680	170.8	4.78	31.1	clear

3.3
2.8
1.0
2.5

Observations

Color: (Clear) Other (describe):	
Odor: (None) Low Medium High Very Strong H2S Fuel-like	
Sample Parameters: VOCs	
Notes: page 1 of 2	
Signed/Sampler(s): [signature]	

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GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: WH6LRW017	Site: NASFW TCE Plume Investigation
Sampler(s): Brad Nielsen John Dofford	Project No: AFC-001-19 CCD
Well Depth: 23.98	Date: 8/26/99 Time: 1520
DTW (ft): 15.77 DTP (ft): —	Courier: ✓ FedEx ~~UPS~~ ___Hand ___Other
MP Ht. Above/Below Ground Surface:	Sampling Method (G=grab, B=bailer, SP=submersible pump) SP
Condition of Bottom of Well: sand/some silt	Type of Pump: Bladder
Screen Interval (ft): 13.9 - 23.9	Weather (sun/clear, overcast/rain, wind direction, ambient temperature):
Well Diameter (in): 4.0	Sunny, wind out of SW, 101°F
Placement of Pump (ft): 20.0	

Field Parameters

Time	Depth to Water (ft)	Flow Rate ~~(gpm)~~ L/min	Total Volume ~~(gal)~~ L	pH	Temp. (C)	Cond. (umhos/cm)	ORP	DO (mg/L)	Turb. (NTU)	Type, Size, and Amount of Sediment Discharged
1608	15.78	0.25	12.0	6.59	23.87	680	171.2	4.78	29.3	clear
1611	15.78	0.25	12.75	6.59	23.67	677	171.9	4.83	26.9	clear
1614	15.78	0.25	13.5	6.59	23.73	678	172.2	4.83	25.7	clear
1617	15.78	0.25	14.25	6.59	23.76	679.0	172.5	4.84	24.6	clear

Observations

Color: Clear Other (describe):

Odor: None Low Medium High Very Strong H2S Fuel-like

Sample Parameters: VOCs

Notes: purge 2002

Signed/Sampler(s): [signature]

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: WHGLRW018	Site: NAS Ft. Worth JRB
Sampler(s): P. Dracunas S. Dalbed	Project No: AFC 001 19 CCD
Well Depth: 27.5	Date: 7-7-99 Time: 1050
DTW (ft): 17.16 DTP (ft): NA	Courier: X FedEx ___ UPS ___ Hand ___ Other
MP Ht. Above/Below Ground Surface: NA	Sampling Method (G=grab, B=bailer, SP=submersible pump)
Condition of Bottom of Well: silty	Type of Pump: Bladder
Screen Interval (ft): 12.5-27.5	Weather (sun/clear, overcast/rain, wind direction, ambient temperature):
Well Diameter (in): 4"	
Placement of Pump (ft): 22.23	Sunny, clear, 95°F

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m) (gpm)	Total Volume (L) (gal)	pH	Temp (C)	Cond. (umhos/cm)	ORP	DO (mg/L)	Turb. (NTU)	Type, Size, and Amount of Sediment Discharged
1055	17.12	0.2	0	7.94	23.78	587	198.6	2.55	133.5	cloudy
1100	17.12	0.2	1.0	7.60	23.16	576	213.6	2.32	157.8	
1105	17.12	0.2	2.0	7.38	22.53	567	234.9	2.33	155.9	
1110	17.12	0.2	3.0	7.36	22.42	565	243.8	2.29	134.2	
1115	17.12	0.2	4.0	7.36	22.28	565	252.7	2.35	117.2	
1120	17.12	0.2	5.0	7.34	22.26	562	259.6	2.38	94.4	
1125	17.12	0.2	6.0	7.33	22.60	566	265.2	2.42	75.0	
1130	17.12	0.2	7.0	7.33	22.64	567	266.0	2.42	72.8	
1135	17.12	0.2	8.0	7.36	22.53	567	246.9	2.55	69.3	
1140	17.12	0.2	9.0	7.33	22.78	570	261.6	2.56	66.4	
1145	17.12	0.2	10.0	7.33	22.89	571	267.1	2.64	64.0	
1150	17.12	0.2	11.0	7.33	22.88	572	273.7	2.60	58.0	
1155	17.12	0.2	12.0	7.33	22.73	570	275.4	2.59	56.5	
1200	17.12	0.2	13.0	7.32	22.79	569	287.8	2.63	49.5	
1205	17.12	0.2	14.0	7.32	22.69	569	290.2	2.63	48.0	
1210	17.12	0.2	15.0	7.34	22.93	571	292.7	2.70	41.8	

1215 – Sample

Observations

Color: Clear Other (describe): cloudy

Odor: None Low Medium High Very Strong H2S Fuel-like

Sample Parameters: VOCs

Notes:

Signed/Sampler(s): [signature]

524 242

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: W HGL RW G 19	Site: NAS Ft. Worth, JRB
Sampler(s): P. Dennmark J. Duffield	Project No: AEC 001 19 CCD
Well Depth: 23.72	Date: 7-7-99 Time: 9:00
DTW (ft): 14.21 DTP (ft): N/A	Courier: x FedEx ___UPS ___Hand ___Other
MP Ht. Above/Below Ground Surface: N/A	Sampling Method (G=grab, B=bailer, SP=submersible pump) SP
Condition of Bottom of Well: ok	Type of Pump: Bladder
Screen Interval (ft): 17 23.72 PD	Weather (sun/clear, overcast/rain, wind direction, ambient temperature):
Well Diameter (in): 4"	
Placement of Pump (ft): 18.97	Sunny, Clear 95°F

Field Parameters

Time	Depth to Water (ft)	Flow Rate (gpm)	Total Volume ~~(gal)~~ L	pH	Temp (C)	Cond. (umhos/cm)	ORP	DO (mg/L)	Turb. (NTU)	Type, Size, and Amount of Sediment Discharged
906	14.24	.2	0.0	7.86	22.56	602.60	221.9	2.23	16.35	
909	14.25	.2	0.6	7.59	22.32	599.00	225.0	2.13	15.01	
912	14.24	.2	01.2	7.51	22.16	597.0	225.7	2.12	13.11	
915	14.25	.2	1.8	7.44	22.11	595.0	226.7	2.08	12.51	
918	14.25	.2	2.4	7.33	22.29	596.0	228.1	2.06	10.25	
921	14.24	.2	3.0	7.28	22.14	596.0	229.9	2.04	9.36	
924	14.24	.2	3.6	7.25	22.22	596.0	232.4	2.02	9.00	
930	Collect		samples							

Observations

Color: (Clear) Other (describe):

Odor: (None) Low Medium High Very Strong H2S Fuel-like

Sample Parameters: VOCs

Notes:

Signed/Sampler(s): [signature] [signature]

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: WHGLT7020	Site: (TCE Plume) NAS Ft. Worth, JRB
Sampler(s): P. Dorcaux & J Dutted	Project No: HFC 001 19 CCD
Well Depth: (14.9) 15.5	Date: 7-8-99 Time: 1330
DTW (ft): 11.8' DTP (ft): N/A	Courier: A FedEx ___ UPS ___ Hand ___ Other
MP Ht. Above/Below Ground Surface: N/A	Sampling Method (G=grab, B=bailer, SP=submersible pump)
Condition of Bottom of Well: ok	Type of Pump: Bladder
Screen Interval (ft): 5-15'	Weather (sun/clear, overcast/rain, wind direction, ambient temperature):
Well Diameter (in): 2"	
Placement of Pump (ft): 13.4	Sunny, Clear 95°F

Field Parameters

Time	Depth to Water (ft)	Flow Rate (gpm)	Total Volume (gal)	pH	Temp. (C)	Cond. (umhos/cm)	ORP	DO (mg/L)	Turb. (NTU)	Type, Size, and Amount of Sediment Discharged
1333	A	.3	0.0	8.43	25.51	685.0	120.8	-2.36	126.0	
1336		.25	0.9	7.63	24.30	674.6	145.9	-2.26	87.0	
1339		.20	1.65	7.38	24.25	675.0	166.2	-1.90	61.5	
1342		.20	2.25	7.33	23.94	670.0	173.6	-1.83	23.7	
1345		.20	2.85	7.31	23.82	667.0	180.0	-1.73	15.9	
1348		.20	3.45	7.28	24.13	670.0	185.2	-1.33	11.6	
1351		.20	4.05	7.26	24.28	671.0	192.5	-1.23	9.0	
1354		.20	4.65	7.25	24.54	674.0	199.0	-0.79	5.2	
1357		.02	5.25	7.26	24.70	678.0	204.4	-0.34	3.90	
1400		.02	5.85	7.26	24.54	674.0	208.6	0.20	3.51	
1403		.02	6.45	7.26	24.47	671.00	209.5	0.20	3.10	
1406		.02	7.05	7.24	24.61	673.0	212.7	0.62	3.05	
1409		.02	7.65	7.25	24.72	674.00	213.9	0.71	2.95	
1412	—	0.2	8.25	7.24	24.69	675.0	214.6	0.86	2.6	
1415	Collect samples									

Observations

Color: Clear Other (describe):	
Odor: None Low Medium High Very Strong H2S Fuel-like	
Sample Parameters: VOCs	
Notes: Top of pump = ~~9.4~~ TD 9.6	
Final DTW = 11.9	
Signed/Sampler(s):	

524 244

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: IWHGL TAC27	Site: NAS Ft. Worth, JRB
Sampler(s): P. Darnowski T. Duffard	Project No: AFC 001 19 CCD
Well Depth: 32.55'	Date: 7-8-99 Time: 820
DTW (ft): 22.05' DTP (ft): N/A	Courier: X FedEx ___UPS ___Hand ___Other
MP Ht. Above/Below Ground Surface: N/A	Sampling Method (G=grab, B=bailer, SP=submersible pump)
Condition of Bottom of Well: silty	Type of Pump: Bladder
Screen Interval (ft): 17-32'	Weather (sun/clear, overcast/rain, wind direction, ambient temperature):
Well Diameter (in): 2"	
Placement of Pump (ft): intake 27.0 top 23.5	Sunny, clear 95°F

Field Parameters

Time	Depth to Water (ft)	Flow Rate (gpm)	Total Volume (~~gal~~) L	pH	Temp (C)	Cond. (umhos/cm)	ORP	DO (mg/L)	Turb. (NTU)	Type, Size, and Amount of Sediment Discharged
835	22.06	0.1	0.0	8.55	24.62	550	216.2	5.98	646	Cloudy
840	22.06	0.15	0.5	7.36	22.33	525.0	241.3	4.89	8.30	
845	22.06	0.05	1.25	7.23	22.29	553.0	239.8	4.78	5.30	
850	22.06	0.20	1.50	7.26	22.34	554.0	243.0	4.72	504	
855	22.06	0.20	2.50	7.25	22.13	522.0	246.7	4.65	1051	
900	22.06	0.2	3.50	7.26	22.13	522.0	252.4	4.56	964	
905	22.06	0.2	4.50	7.29	22.40	524.0	255.1	4.55	673	
910	22.06	0.2	5.50	7.30	22.15	523.0	258.5	4.45	493	
915	22.06	0.2	6.50	7.32	22.20	523.0	260.1	4.49	354	
920	22.06	0.2	7.50	7.33	22.14	553.0	261.0	4.44	273	
925	22.06	0.2	8.50	7.34	22.11	551.0	262.2	4.54	232	
930	22.06	0.2	9.50	7.34	21.48	514.0	264.3	4.45	208	
935	22.06	0.2	10.50	7.36	21.54	515.0	263.8	4.51	207	
940	22.06	0.2	11.50	7.37	21.30	512.0	263.5	4.56	205	
945	22.06	0.2	12.50	7.38	21.56	514.0	261.7	4.76	190	
950	22.06	0.2	13.50	7.40	21.78	517.0	262.4	4.47	185	

955 Collect sampler

Observations

Color: Clear (PD) Other (describe):	silty
Odor: None Low Medium High Very Strong H2S Fuel-like	
Sample Parameters:	VOCs
Notes:	PID = 21.7
	Final DTW 22.06
Signed/Sampler(s):	

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: WHGLTA 023	Site: NAS Ft. Worth JRB
Sampler(s): P. Dorman, J. Duffield	Project No: AFC 001 19 CCD
Well Depth: 29'	Date: 7-7-99 Time: 1330
DTW (ft): 16.28' DTP (ft): NA	Courier: (FedEx ___UPS ___Hand ___Other
MP Ht. Above/Below Ground Surface: NA	Sampling Method (G=grab, B=bailer, SP=submersible pump) SP
Condition of Bottom of Well: (.4' silt)	Type of Pump: Bladder
Screen Interval (ft): 9' - 29'	Weather (sun/clear, overcast/rain, wind direction, ambient temperature):
Well Diameter (in): 2'	
Placement of Pump (ft): 22.64	Sunny, Clear, 95°F

Field Parameters

Time	Depth to Water (ft)	Flow Rate (gpm)	Total Volume (gal)	pH	Temp (C)	Cond (umhos/cm)	ORP	DO (mg/L)	Turb (NTU)	Type, Size, and Amount of Sediment Discharged
1335	16.75	.2	0	8.06	23.43	552.00	167.9	6.65	1490	Cloudy
1340	16.72	.2	.6	7.66	23.13	549.0	200.9	7.58	1465	
1345	16.72	.2	1.2	7.51	22.81	545.0	224.9	7.50	1359	
1350	16.72	.2	1.8	7.41	22.41	541.6	245.7	5.76	1215	
1355	16.72	.2	2.4	7.38	22.22	539.0	258.2	5.47	985	
1400	16.72	.2	3.0	7.37	22.42	541.0	276.7	5.43	592	
1405	16.72	.2	3.6	7.35	22.23	539.0	281.3	5.41	393	
1410	16.72	.2	4.2	7.34	22.44	541.0	288.6	5.77	253	
1415	16.72	.2	4.8	7.33	22.88	544.6	293.7	5.86	216	
1420	16.72	.2	5.4	7.34	23.07	548.00	297.7	7.64	215	
1425	16.72	.2	6.0	7.34	23.76	554.0	300.1	7.76	189	
1430	16.72	.2	6.6	7.34	22.76	543.0	303.0	7.62	146	
1435	16.72	.2	7.2	7.34	22.87	545.0	303.6	7.35	120	
1440	16.72	.2	7.8	7.35	23.07	546.6	304.9	7.35	90.2	
1445	16.72	.2	8.4	7.36	22.96	546.0	305.3	7.42	77.0	
1450	16.72	.2	9.0	7.36	23.19	549.0	303.7	7.13	70.0	

1452 Collect sample

Observations

Color: Clear Other (describe): Cloudy

Odor: None Low Medium High Very Strong H2S Fuel-like

Sample Parameters: VOCs

Notes:

Signed/Sampler(s): Peter Dorman John E Duffield

524 246

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: WH6-LTAO-25	Site:
Sampler(s): P Dennis	Project No: AFC001 19 CCD
Well Depth: 21.36'	Date: 7-8-99 / Time: 1105
DTW (ft): 15.62 / DTP (ft): N/A	Courier: X FedEx ___UPS ___Hand ___Other
MP Ht. Above/Below Ground Surface: N/A	Sampling Method (G=grab, B=bailer, SP=submersible pump)
Condition of Bottom of Well: ok	Type of Pump: Bladder
Screen Interval (ft): 10.5 - 20.5	Weather (sun/clear, overcast/rain, wind direction, ambient temperature):
Well Diameter (in): 2"	
Placement of Pump (ft): 18.06	Sunny, clear 95°F

Field Parameters

Time	Depth to Water (ft)	Flow Rate (gpm)	Total Volume (gal)	pH	Temp. (C)	Cond. (umhos/cm)	ORP	DO (mg/L)	Turb. (NTU)	Type, Size, and Amount of Sediment Discharged
1110	*	.15	0.0	8.02	27.64	512	184.7	3.46	76.5	
1113		.15	0.45	7.88	26.29	507	192.0	3.17	64.3	
1116		.15	0.90	7.73	25.06	497	204.6	3.00	54.5	
1119		.15	1.35	7.69	24.92	495.6	208.1	2.97	45.5	
1122		.15	1.8	7.66	24.91	494.00	211.4	2.95	37.2	
1125		.15	2.25	7.63	24.79	491.00	215.5	2.89	32.5	
1128		.15	2.70	7.61	24.73	490.6	218.2	2.92	27.5	
1131		.15	3.15	7.59	24.42	483.6	220.8	2.96	23.0	
1134		.15	3.60	7.56	24.34	481.6	223.7	2.92	19.5	
1137		.15	4.05	7.54	24.29	480.6	229.6	2.85	16.3	
1140		.15	4.50	7.52	24.14	477.0	233.7	2.83	13.0	
1143		.15	4.95	7.51	24.14	477.0	236.7	2.81	11.51	
1146		.15	5.40	7.49	24.0	475.6	243.8	2.74	10.23	
1149		.15	5.85	7.48	23.89	474.6	247.4	2.67	8.34	
1152		.15	6.20	7.47	23.51	471.0	251.0	2.64	7.41	
1155	Collect samples									

Observations

Color: Clear Other (describe):

Odor: None Low Medium High Very Strong H2S Fuel-like

Sample Parameters: VOCs

Notes: * Top of pump @ 14.56

Signed/Sampler(s): [signature]

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: WHGLRW015	Location: NAS Fort Worth JRB
Sampler(s): C. Williams, B. Nielsen	Project Name: Groundwater Sampling
Well Depth: 23.06'	Project #: AFC-001-~~19CCD~~ 19 CC D Date: 9/14/99 Time: 0905
DTW (ft): 14.91 DTP (ft): —	Courier: ___FedEx ✓ UPS ___Hand ___Other
MP Ht. Above/Below Ground Surface: 0	Sampling Method ~~Bladder Pump~~, Grab
Condition of Bottom of Well: Some silt	Type of Pump: Bladder Pump
Screen Interval (ft): 13.11 - 23.11	Weather (sun/clear, overcast/rain, wind direction, ambient temperature):
Well Diameter (in): 4"	Clear, 78°, wind from the North
Placement of Pump (ft): 19'	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH	Temp. (C)	Cond. (umhos/cm)	ORP (mv)	DO (mg/L)	Turb. (NTU)	Type, Size, and Amount of Sediment Discharged
0840	14.91	0.2	1.0	6.72	20.83	764	292.2	3.88	15.49	
0843	~~14.91~~ 14.91	0.2	1.6	6.72	20.78	763	289	3.28	12.98	
0846	14.91	0.2	2.2	6.72	20.78	763	285	3.19	14.80	
0849	14.91	0.2	2.8	6.72	20.81	763	283	3.18	13.09	
0852	14.91	0.2	3.4	6.72	20.80	763	280	3.20	13.19	
0855	14.91	0.15	3.8	6.72	20.82	763	279	3.18	12.78	
0858	14.91	0.15	4.3	6.72	20.86	764	277	3.19	12.90	
0901	14.91	0.15	4.7	6.71	20.84	763	275	3.29	13.07	
0905	Collect samples									

Observations

Color: Clear Other (describe):

Odor: None Low Medium High Very Strong H2S Fuel-like

Notes:

Signed/Sampler(s): C. Williams

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GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: ~~TB091799~~ WHGLRW016	Location: NAS Fort Worth JRB
Sampler(s): B. Nielsen, C. Williams	Project Name: Groundwater Sampling
Well Depth: 22.58'	Project #: AFC-001-19CCD Date: 9-16-99 Time: 1040
DTW (ft): 13.83 DTP (ft): –	Courier: ___FedEx ✓UPS ___Hand ___Other
MP Ht. Above/Below Ground Surface:	Sampling Method: Grab
Condition of Bottom of Well: Trace of silt	Type of Pump: Bladder
Screen Interval (ft): 12.6 – 22.6'	Weather (sun/clear, overcast/rain, wind direction, ambient temperature):
Well Diameter (in): 4"	Overcast, 84°
Placement of Pump (ft): 18.2'	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH	Temp. (C)	Cond. (umhos/cm)	ORP (mv)	DO (mg/L)	Turb. (NTU)	Type, Size, and Amount of Sediment Discharged
0955	Begin pumping well.									
1003	13.84	0.2	2.0	6.69	23.52	726	257	5.06	16.56	
1006	13.84	0.2	2.6	6.68	23.33	724	251	3.37	18.2	
1009	13.83	0.2	3.2	6.68	23.34	724	248	3.28	16.0	
1012	13.83	0.2	3.8	6.67	23.40	725	245	3.28	14.9	
1015	13.83	0.2	4.4	6.68	23.43	726	241	3.49	13.51	
1018	13.84	0.2	5.0	6.67	23.50	727	239	3.29	11.62	
1021	13.84	0.2	5.6	6.66	23.52	727	236	3.30	11.10	
1024	13.84	0.2	6.2	6.66	23.58	728	235	3.31	10.05	
1027	13.84	0.15	6.6	6.67	23.60	728	231	3.68	9.45	
1030	13.84	0.15	6.9	6.66	23.62	729	231	3.34	9.52	
1033	13.84	0.15	7.3	6.66	23.68	729	230	3.34	8.92	
1036	13.84	0.15	7.8	6.66	23.94	733	227	3.46	7.95	
1040	Collect samples									

Observations

Color: (Clear) Other (describe):

Odor: (None) Low Medium High Very Strong H2S Fuel-like

Notes:

Signed/Sampler(s): [signature]

524-249

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: ~~TB091699~~ WHGLRW017	Location: NAS Fort Worth JRB
Sampler(s): B. Nielsen, C. Williams	Project Name: Groundwater Sampling
Well Depth: 23.92'	Project #: AFC-001-19CCD Date: 9-16-99 Time: 1525
DTW (ft): 15.85' DTP (ft): —	Courier: ___FedEx ✓ UPS ___Hand ___Other
MP Ht. Above/Below Ground Surface:	Sampling Method: Grab
Condition of Bottom of Well: 2" of Silt	Type of Pump: Bladder
Screen Interval (ft): -	Weather (sun/clear, overcast/rain, wind direction, ambient temperature): Partly cloudy, 85°
Well Diameter (in): 4"	
Placement of Pump (ft): 20'	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH	Temp (C)	Cond (umhos/cm)	ORP (mv)	DO (mg/L)	Turb (NTU)	Type, Size, and Amount of Sediment Discharged
1435	Begin purging well.									
1447	15.84	0.1	1.0	6.65	23.69	767	188	5.69	61.0	
1450	15.84	0.1	1.3	6.62	23.14	758	189	4.08	51.7	
1453	15.84	0.1	1.6	6.61	22.77	753	192	3.89	42.6	
1456	15.84	0.1	1.9	6.61	22.89	754	193	3.87	40.4	
1459	15.84	0.1	2.2	6.63	22.70	751	186	4.82	34.1	
1502	15.84	0.1	2.5	6.61	22.68	750	188	3.99	31.8	
1505	15.84	0.1	2.8	6.61	22.73	751	191	3.82	28.0	
1508	15.84	0.1	3.1	6.60	22.51	747	193	3.79	25.3	
1511	15.85	0.1	3.4	6.61	22.49	747	194	3.93	23.3	
1514	15.85	0.1	3.7	6.60	22.50	747	194	3.79	22.2	
1517	15.85	0.1	4.0	6.60	22.48	747	195	3.81	18.2	
1520	15.85	0.1	4.3	6.60	22.44	746	195	4.03	18.3	
1523	15.85	0.1	4.7	6.60	22.45	746	195	3.82	17.6	
1525	Collect samples									

Observations

Color: (Clear) Other (describe):

Odor: (None) Low Medium High Very Strong H2S Fuel-like

Notes:

Signed/Sampler(s): C. Williams, B. Nielsen

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GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: WHGLRW018	Location: NAS Fort Worth JRB
Sampler(s): B. Nielsen, C Williams	Project Name: Groundwater Sampling
Well Depth: 27.15'	Project #: AFC-001-19CCD Date: 9-15-99 Time: 1610
DTW (ft): 17.98' DTP (ft): —	Courier: ___FedEx ✓UPS ___Hand ___Other
MP Ht. Above/Below Ground Surface: 0	Sampling Method : Grab
Condition of Bottom of Well: 3" of Sediment	Type of Pump: Bladder
Screen Interval (ft): 12.5 - 27.5	Weather (sun/clear, overcast/rain, wind direction, ambient temperature):
Well Diameter (in): 4"	Clear, 85°, Wind from NE.
Placement of Pump (ft): 22.5'	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH ±0.1	Temp. (C) ±1°C	Cond. (umhos/cm) ±~~10%~~ 3%	ORP (mv) ±~~5~~ 10	DO (mg/L) ±10%	Turb. (NTU) <10	Type, Size, and Amount of Sediment Discharged
1545	Begin	purging	well.							
1550	17.86	0.10	0.5	6.74	24.35	710	184	4.30	20.0	
1553	17.90	0.10	0.8	6.72	23.91	702	187	4.07	12.0	
1556	17.95	0.10	1.1	6.72	23.97	702	191	4.01	10.15	
1559	~~17.85~~ 17.90	0.10	1.4	6.73	24.03	704	192	4.52	8.48	
1602	17.97	0.10	1.7	6.71	24.11	704	194	4.01	9.50	
1605	17.97	0.10	2.0	6.71	24.25	706	197	4.00	7.90	
1608	17.97	0.10	2.3	6.71	24.47	709	198	4.11	7.45	
1610	Collect	Samples.								

Observations

Color: (Clear) Other (describe):

Odor: (None) Low Medium High Very Strong H2S Fuel-like

Notes:

Signed/Sampler(s): C. Williams [signature]

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: WHGLRW019	Location: NAS Fort Worth JRB
Sampler(s): C. Williams, B. Nielsen	Project Name: Groundwater Sampling
Well Depth: 23.63	Project #: AFC-001-19CCD Date: 9-14-99 Time: 1420
DTW (ft): 14.96 DTP (ft): —	Courier: ___ FedEx ✓ UPS ___ Hand ___ Other
MP Ht. Above/Below Ground Surface: 0	Sampling Method: Grab
Condition of Bottom of Well: Some silt	Type of Pump: Bladder Pump
Screen Interval (ft): ~~17~~ 13 - 23	Weather (sun/clear, overcast/rain, wind direction, ambient temperature):
Well Diameter (in): 4"	Clear, 85°
Placement of Pump (ft): 19.3'	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH ± 0.1	Temp. (C) ± 1°C	Cond. (umhos/cm) ± 3%	ORP (mv) ± 10mV	DO (mg/L) ± 10%	Turb. (NTU) ± 10%	Type, Size, and Amount of Sediment Discharged 10NTU
1400	Begin purging well, establish flow rate of 0.10 L/min.									
1402	14.98	0.10	0.4	6.69	24.36	783	195	5.53	12.62	
1405	14.98	0.10	0.7	6.67	24.22	779	196	4.55	7.11	
1408	14.98	0.10	1.0	6.66	24.29	781	197	4.45	6.45	
1411	15.01	0.13	1.4	6.67	24.19	778	198	4.58	5.72	
1414	15.02	0.13	1.8	6.65	23.30	764	199	4.38	4.37	
1417	15.02	0.13	2.0	6.65	23.22	763	199	4.35	3.50	
1420	Collect sample									

Observations

Color: Clear Other (describe):

Odor: None Low Medium High Very Strong H2S Fuel-like

Notes:

Signed/Sampler(s): C. Williams, [illegible]

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GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: WHGLTA022	Location: NAS Fort Worth JRB
Sampler(s): B. Nielsen C. Williams	Project Name: Groundwater Sampling
Well Depth:	Project #: AFC-001-19CCD Date: 9-15-99 Time: 1250
DTW (ft): DTP (ft):	Courier: ___FedEx ✓UPS ___Hand ___Other
MP Ht. Above/Below Ground Surface: 0	Sampling Method : Grab
Condition of Bottom of Well:	Type of Pump: Bladder
Screen Interval (ft): 17 - 32	Weather (sun/clear, overcast/rain, wind direction, ambient temperature):
Well Diameter (in): 2"	Clear, 85°
Placement of Pump (ft): 27.6'	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH	Temp. (C)	Cond. (umhos/cm)	ORP (mv)	DO (mg/L)	Turb. (NTU)	Type, Size, and Amount of Sediment Discharged
1140	Start	Purging well.								
1148	22.73	0.10	0.8	6.77	25.08	728	215	7.60	514	
1151	22.72	0.10	1.1	6.74	24.60	720	217	6.48	444	
1154	22.70	0.10	1.4	6.72	24.24	713	218	6.30	414	
1157	22.71	0.10	1.7	6.72	24.05	709	218	6.25	353	
1200	22.71	0.1	2.0	6.74	23.37	700	206	7.17	313	
1203	22.71	0.1	2.3	6.70	23.38	700	210	6.33	266	
1206	22.71	0.1	2.7	6.69	23.45	701	211	6.25	245	
1209	22.71	0.1	3.0	6.68	23.25	699	211	6.25	218	
1212	22.71	0.1	3.3	6.69	23.22	698	211	6.45	206	
1215	22.71	0.1	3.6	6.68	23.69	705	210	6.20	185	
1218	22.71	0.1	3.9	6.69	24.09	711	210	6.26	159	
1221	22.71	0.1	4.2	6.72	24.35	715	206	6.50	164	
1224	22.71	0.1	4.5	6.69	24.24	714	207	6.30	156	
1227	22.71	0.1	4.8	6.68	24.13	712	207	6.29	136	
1230	22.71	0.1	5.1	6.69	24.29	714	207	6.27	126	

Observations

Color: Clear Other (describe):

Odor: None Low Medium High Very Strong H2S Fuel-like

Notes:

Signed/Sampler(s): (Sigs on next page)

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: ~~EB011199~~ WHGLTA022, cont	Location: NAS Fort Worth JRB
Sampler(s): (see previous page)	Project Name: Groundwater Sampling
Well Depth:	Project #: AFC-001-19CCD Date: 9-15-99 Time: 1250
DTW (ft): DTP (ft):	Courier: ___FedEx ___UPS ___Hand ___Other
MP Ht. Above/Below Ground Surface:	Sampling Method :
Condition of Bottom of Well:	Type of Pump:
Screen Interval (ft):	Weather (sun/clear, overcast/rain, wind direction, ambient temperature):
Well Diameter (in):	
Placement of Pump (ft):	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH	Temp. (C)	Cond. (umhos/cm)	ORP (mv)	DO (mg/L)	Turb. (NTU)	Type, Size, and Amount of Sediment Discharged
1233	22.71	0.1	5.4	6.70	24.56	718	206	6.32	116	
1236	22.71	0.1	5.7	6.69	24.68	720	206	6.33	106.7	
1239	22.71	0.1	6.0	6.69	24.78	721	206	6.33	99.6	
1242	22.71	0.1	6.3	6.68	24.48	716	205	6.86	97.2	
1245	22.71	0.1	6.6	6.68	24.33	715	205	6.39	89.5	
1250	Collect samples									

Observations

Color: Clear Other (describe): Murky

Odor: None Low Medium High Very Strong H2S Fuel-like

Notes:

Signed/Sampler(s): [illegible], C. Williams

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GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: WHGLTA023	Location: NAS Fort Worth JRB
Sampler(s): B. Nielsen, C. Williams	Project Name: Groundwater Sampling
Well Depth: 28.63'	Project #: AFC-001-19CCD Date: 9-16-99 Time: 1215
DTW (ft): 17.38' DTP (ft): —	Courier: ___FedEx ✓UPS ___Hand ___Other
MP Ht. Above/Below Ground Surface: 0	Sampling Method: Grab
Condition of Bottom of Well: Trace of Silt	Type of Pump: Bladder
Screen Interval (ft): 9 - 29	Weather (sun/clear, overcast/rain, wind direction, ambient temperature): Mostly cloudy, 84°
Well Diameter (in): 2"	
Placement of Pump (ft): 22.6'	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH	Temp. (C)	Cond. (umhos/cm)	ORP (mv)	DO (mg/L)	Turb. (NTU)	Type, Size, and Amount of Sediment Discharged
1135	Start	purging	well.							
1144	17.43	0.15	1.0	6.75	22.82	678	228	5.63	74.8	
1147	17.43	0.15	1.3	6.72	22.65	675	228	5.22	61.4	
1150	17.43	0.15	1.7	6.72	22.60	674	227	5.16	49.7	
1153	17.43	0.15	2.0	6.72	22.58	674	227	5.12	40.5	
1156	17.43	0.1	2.3	6.72	22.59	675	225	5.18	37.2	
1159	17.43	0.1	2.6	6.71	22.71	676	225	5.10	32.0	
1202	17.43	0.1	2.9	6.71	22.82	678	224	5.09	28.7	
1205	17.43	0.1	3.2	6.70	22.95	680	223	5.83	25.0	
1208	17.43	0.1	3.5	6.70	22.84	678	222	5.11	27.6	
1211	17.43	0.1	3.8	6.71	22.76	678	222	5.09	26.3	
1214	17.43	0.15	4.1	6.71	22.20	669	222	5.14	27.1	
1215	Collect	samples								

Observations

Color: (Clear) Other (describe):

Odor: (None) Low Medium High Very Strong H2S Fuel-like

Notes:

Signed/Sampler(s): C. Williams, B. Nielsen

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: WHGLTA025	Location: NAS Fort Worth JRB
Sampler(s): B. Nielsen, C. Williams	Project Name: Groundwater Sampling
Well Depth: 21.35'	Project #: AFC-001-19CCD Date: 9-14-99 Time: 1650
DTW (ft): 16.40' DTP (ft): —	Courier: ___ FedEx ✓ UPS ___ Hand ___ Other
MP Ht. Above/Below Ground Surface: 0	Sampling Method: Grab
Condition of Bottom of Well: Some silt	Type of Pump: Bladder
Screen Interval (ft): 10.5 - 20.5	Weather (sun/clear, overcast/rain, wind direction, ambient temperature): Clear, 85°
Well Diameter (in): 2"	
Placement of Pump (ft): 19.8"	

Field Parameters

Time	Depth to Water (ft)*	Flow Rate (L/m)	Total Volume (L)	pH	Temp. (C)	Cond. (umhos/cm)	ORP (mv)	DO (mg/L)	Turb. (NTU)	Type, Size, and Amount of Sediment Discharged
1530	Start	purging	well.	Estab	lish	flow	rate of	0.10	L/min.	
1536		0.10	0.60	6.93	26.36	611	196.9	7.10	136.4	
1539		0.10	0.90	6.90	26.17	608	199.1	4.91	133.8	
1542		0.10	1.20	6.88	25.44	605	199.0	4.56	132.4	
1545		0.10	1.5	6.88	25.21	603	199.1	4.46	130.2	
1548		0.10	1.8	6.90	25.03	601	196.0	4.66	100.4	
1551		0.10	2.1	6.88	24.77	597	199.1	4.43	68.5	
1554		0.10	2.4	6.88	24.52	593	200.5	4.45	40.6	
1557		0.10	2.7	6.88	24.57	594	201.7	4.50	31.4	
1600		0.10	3.0	6.90	24.50	592	198.5	5.11	26.3	
1603		0.10	3.3	6.89	24.71	593	202.8	4.54	18.3	
1606		0.10	3.6	6.89	24.87	595	204.3	4.60	16.2	
1609		0.10	3.9	6.90	24.97	597	205.7	4.90	14.64	
1612		0.10	4.2	6.90	25.10	598	207.0	4.63	12.1	
1615		0.10	4.5	6.90	25.20	600	208.5	4.63	11.31	
1618		0.10	4.8	6.90	25.38	601	209.5	4.67		

Observations

Color: Clear Other (describe): Si

Odor: None Low Medium High Very Strong H2S Fuel-like

Notes: * Water depth could not be measured, below top of pump.

Signed/Sampler(s): B. Nielsen

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GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: ~~EB091499~~ GW WHGLTA025-cont WG02	Location: NAS Fort Worth JRB
Sampler(s): R. Nielsen, C. Williams	Project Name: Groundwater Sampling
Well Depth: (see pg. 1)	Project #: AFC-001-19CCD Date: 9-14-99 Time: 1650
DTW (ft): DTP (ft):	Courier: ___FedEx ✓ UPS ___Hand ___Other
MP Ht. Above/Below Ground Surface:	Sampling Method :
Condition of Bottom of Well:	Type of Pump:
Screen Interval (ft): -	Weather (sun/clear, overcast/rain, wind direction, ambient temperature):
Well Diameter (in):	
Placement of Pump (ft):	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH	Temp (C)	Cond (umhos/cm)	ORP (mv)	DO (mg/L)	Turb. (NTU)	Type, Size, and Amount of Sediment Discharged
1620	Air compressor stopped working, changed with different compressor.									
1630	Started purging again.									
1640		0.1	5.0	6.92	26.11	615	201.9	6.72	21.2	
1643		0.1	5.3	6.90	25.52	605	206.9	5.07	8.2	
1646		0.1	5.6	6.89	25.68	606	208.8	4.79	5.12	
1649		0.1	5.9	6.90	25.99	611	210.4	4.81	7.04	
1650	Collect Samples									

Observations

Color: Clear Other (describe):

Odor: None Low Medium High Very Strong H2S Fuel-like

Notes:

Signed/Sampler(s): C. Williams

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: WHGLRW015	Location: NAS Fort Worth JRB
Sampler(s): J. Wallace, C. Williams	Project Name: ~~DO 19~~ Plume Delineation
Well Depth: 22.3'	Project #: AFC 001 19 CCD Date: 11-4-99 Time: 1730
DTW (ft): 15.1' DTP (ft): —	Courier: ✓ FedEx ___ UPS ___ Hand ___ Other
MP Ht. Above/Below Ground Surface: 0	Sampling Method: Grab
Condition of Bottom of Well: Slightly silty	Type of Pump: Bladder
Screen Interval (ft): 13.11 - 23.11	Weather (sun/clear, overcast/rain, wind direction, ambient temperature):
Well Diameter (in): 4"	Clear, 68°
Placement of Pump (ft): 19.2"	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH	Temp. (C)	Cond. (umhos/cm)	ORP (mv)	DO (mg/L)	Turb. (NTU)	Type, Size, and Amount of Sediment Discharged
1742	15.1	0.1	0.0	6.76	21.07	913	229	3.30	55	
1745	15.1	0.2	0.3	6.73	21.03	915	231	3.04	34	
1748 ~~748~~	15.1	0.3	0.9	6.72	20.98	915	232	2.98	33.5	
1751	15.1	0.3	1.8	6.71	20.98	915	234	2.93	30.0	
1754	15.1	0.3	2.7	6.71	20.97	915	235	2.90	27.8	
1757	15.1	0.3	3.6	6.71	20.98	915	235	2.90	26.1	
1800	15.1	0.3	4.5	6.71	20.98	915	236	2.99	25.4	
1803	15.1	0.4	6.1	6.71	20.99	915	236	3.09	25.0	
1806	15.1	0.4	7.7	6.71	21.00	916	237	3.15	24.7	
1809	15.1	0.4	9.3	6.71	21.02	916	238	3.15	23.5	
1812	15.1	0.4	10.9	6.71	21.02	916	238	3.15	22.1	
1815	15.1	0.4	12.5	6.72	21.01	917	239	3.20	21.2	
1818	15.1	0.4	14.1	6.72	21.02	916	239	3.35	21.3	
1821	15.1	0.4	15.7	6.72	21.03	917	240	3.50	21.7	
1824	15.1	0.4	17.3	6.73	21.02	917	240	3.60	20.5	
1825	Collect samples									

Observations

Color: (Clear) Other (describe):

Odor: (None) Low Medium High Very Strong H2S Fuel-like

Notes:

Signed/Sampler(s): C. Williams

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GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: WHGLRW016	Location: NAS Fort Worth JRB
Sampler(s): C. Williams / J. Wallace	Project Name: ~~BC-19~~ Plume Delineation
Well Depth: 22.58	Project #: AFC 001 19 CCD Date: 11/3/99 Time: 0958
DTW (ft): 13.92 DTP (ft): —	Courier: X FedEx ___ UPS ___ Hand ___ Other
MP Ht. Above/Below Ground Surface:	Sampling Method: GRAB
Condition of Bottom of Well: silty	Type of Pump: Bladder
Screen Interval (ft): -	Weather (sun/clear, overcast/rain, wind direction, ambient temperature):
Well Diameter (in): 4	Sunny, clear, wind from N, 60°
Placement of Pump (ft): 18.25	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH ±.1	Temp. (C) ±1	Cond. (umhos/cm) ±3%	ORP (mv) ±10	DO (mg/L) ±10%	Turb. (NTU) <10	Type, Size, and Amount of Sediment Discharged
1007	13.92	0.15	0	6.38	21.01	608.0	246.2	3.61	12.42	
1010	13.94	0.15	0.45	6.48	21.92	611.0	247.3	3.25	11.23	
1013	13.92	0.15	0.9	6.52	22.21	613.0	246.7	3.12	10.33	
1016	13.92	.15	1.35	6.55	22.37	615.0	246.7	3.06	9.78	
1019	13.92	.15	1.80	6.56	22.39	616.0	246.5	3.01	9.60	
1021	13.92	.15	2.25	6.57	22.43	616.0	246.6	2.97	9.16	

Observations

Color: Clear Other (describe): clear

Odor: (None) Low Medium High Very Strong H2S Fuel-like

Notes:

Signed/Sampler(s): C. Williams, J. Wallace

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: WHGLRW017	Location: NAS Fort Worth JRB
Sampler(s): C. Williams/J. Wallace	Project Name: ~~DO 19~~ Plume Delineation
Well Depth: 23.95	Project #: AFC 001 19 CCD Date: 11/3/99 Time: 1130
DTW (ft): 16 DTP (ft): —	Courier: X FedEx ___ UPS ___ Hand ___ Other
MP Ht. Above/Below Ground Surface:	Sampling Method: Grab
Condition of Bottom of Well: silty	Type of Pump: Bladder
Screen Interval (ft): -	Weather (sun/clear, overcast/rain, wind direction, ambient temperature): sunny, clear, wind from N, 60°
Well Diameter (in): 4	
Placement of Pump (ft): ~~17~~ 20	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH	Temp. (C)	Cond. (umhos/cm)	ORP (mv)	DO (mg/L)	Turb. (NTU)	Type, Size, and Amount of Sediment Discharged
1142	16.0	0.2	0	6.63	21.13	623.0	243.0	6.21	22.20	
1145	16.0	0.2	0.6	6.57	21.06	625.0	241.7	4.67	44.63	
1148	~~16.0~~ 16.0	0.2	1.2	6.58	21.12	630.0	239.6	3.76	602.00	
1151	16.0	0.2	1.8	6.59	21.17	631.0	237.7	3.32	~~631.00~~ 600.00	
1154	16.0	0.15	2.25	6.59	21.17	631.0	237.8	3.69	534.0	
1157	16.0	0.15	2.70	6.58	21.10	635.0	238.1	3.43	477.0	
1200	16.0	~~0.15~~ 0.30	~~3.15~~ 3.30	6.59	21.05	632.0	238.1	3.41	399.0	
1203	16.0	0.20	3.90	6.59	20.97	630.0	237.5	3.39	361.0	
1206	16.0	0.20	4.50	6.59	20.97	629.0	237.3	3.43	270.0	
1209	16.0	0.20	5.10	6.59	20.98	628.0	237.1	3.71	226.0	
1211	16.0	0.20	5.70	6.58	20.99	627.0	237.1	3.76	166.3	
1214	16.0	0.20	6.30	6.58	20.97	626.0	237.1	4.40	143.9	
1217	16.0	0.20	6.90	6.58	20.97	626.0	237.3	4.38	124.4	
1219	16.0	0.20	7.50	6.59	20.97	625.0	237.4	4.26	103.9	
1221	16.0	0.20	8.10	6.59	20.91	624.0	237.7	4.41	91.6	
1224	16.0	0.20	8.70	6.60	20.92	624.0	237.8	4.38	83.2	

Observations

Color: Clear Other (describe): murky

Odor: None Low Medium High Very Strong H2S Fuel-like

Notes:

Signed/Sampler(s): (Signatures on next page)

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GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: ~~[illegible]~~ WHGLRW017	Location: NAS Fort Worth JRB
Sampler(s): C. Williams / J. Wallace	Project Name: ~~[illegible]~~ Plume Delineation
Well Depth: 23.95	Project #: AFC 001 19 CCD Date: 11/3/99 Time: 1130
DTW (ft): 16 DTP (ft): —	Courier: X FedEx ___UPS ___Hand ___Other
MP Ht. Above/Below Ground Surface:	Sampling Method : Grab
Condition of Bottom of Well: silty	Type of Pump: Bladder
Screen Interval (ft): ~~[illegible]~~	Weather (sun/clear, overcast/rain, wind direction, ambient temperature): sunny, clear, wind from N, 60°
Well Diameter (in): 4	
Placement of Pump (ft): 20	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH	Temp. (C)	Cond. (umhos/cm)	ORP (mv)	DO (mg/L)	Turb. (NTU)	Type, Size, and Amount of Sediment Discharged
1227	16	0.2	9.30	6.61	20.95	624.0	238.1	4.52	79.3	
1230	16	0.2	9.90	6.61	20.97	624.0	238.4	4.65	71.4	
1233	16	0.2	10.50	6.62	20.95	623.0	238.7	4.75	64.7	
1237	16	0.2	11.10	6.62	20.96	623.0	239.8	4.74	61.0	
1240	16	0.2	11.70	6.62	20.95	623.0	239.2	4.78	50.4	
1243	16	0.2	12.30	6.62	20.95	623.0	239.1	4.80	46.7	
1246	16	0.2	12.90	6.61	20.92	622.0	239.0	4.75	41.8	
1249	16	0.2	13.50	6.61	20.92	622.0	238.7	4.75	35.8	
1251	16	0.2	14.10	6.61	20.87	621.0	238.6	4.72	34.8	
1254	16	0.2	14.70	6.61	20.86	621.0	238.5	4.67	29.9	

Observations

Color: Clear Other (describe): clear

Odor: None Low Medium High Very Strong H2S Fuel-like

Notes:

Signed/Sampler(s): C. Williams, [illegible]

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: WHGLRW018	Location: NAS Fort Worth JRB
Sampler(s): C. Williams & J. Wallace	Project Name: ~~DO 19~~ Plume Delineation
Well Depth: 27.12	Project #: AFC 001 19 CCD Date: 11/1/99 Time: 1510
DTW (ft): 18.22 DTP (ft): —	Courier: ✓ FedEx ___ UPS ___ Hand ___ Other
MP Ht. Above/Below Ground Surface: 0	Sampling Method: Grab
Condition of Bottom of Well: Soft, ≈3" of Silt	Type of Pump: Bladder Pump
Screen Interval (ft): 12.5 - 27.5	Weather (sun/clear, overcast/rain, wind direction, ambient temperature): Sunny 60°; slight breeze from south
Well Diameter (in): 4	
Placement of Pump (ft): 19.7	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH ±.1	Temp (C) ±1°	Cond (umhos/cm) ±3%	ORP (mv) ±10	DO (mg/L) ±10%	Turb (NTU) <10	Type, Size, and Amount of Sediment Discharged
1536	18.19	0.1	0.0	6.60	22.06	1015.0	274	7.99	10.3	
1539	18.19	0.2	0.6	6.65	21.70	962.0	273.8	7.55	8.87	
1542	18.20	0.2	1.2	6.67	21.44	942.0	274.2	7.52	9.37	
1545	18.20	0.2	~~1.8~~ (cuming)	6.68	21.37	935.0	275.2	~~7.90~~ 7.70	8.52	
1548	18.20	0.2	2.4	6.70	21.32	933.0	276.0	8.6	8.94	
1551	18.21	0.2	3.0	6.71	22.26	931.0	277.6	9.67	8.99	
1554	18.21	0.2	3.6	6.71	21.27	932.0	278.6	10.84	9.42	
1557	18.21	0.2	4.2	6.71	21.26	931.0	279.0	12.90	8.54	
1600	18.21	0.2	4.8	6.72	21.25	931.0	279.4	12.13	8.42	
1603	18.21	0.2	5.4	6.72	21.22	930.0	280.2	13.03	8.92	

Observations

Color: Clear Other (describe): clear

Odor: (None) Low Medium High Very Strong H2S Fuel-like

Notes:

Signed/Sampler(s): C. Williams, J. Wall

524 262

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: WHGLRW019	Location: NAS Fort Worth JRB
Sampler(s): C. Williams, J. Wallace	Project Name: ~~DO 19~~ Plume Delineation
Well Depth: 23.79'	Project #: AFC 001 19 CCD Date: 11-4-99 Time: 905
DTW (ft): 15.3' DTP (ft): —	Courier: ✓ FedEx ___ UPS ___ Hand ___ Other
MP Ht. Above/Below Ground Surface: 0	Sampling Method: Grab
Condition of Bottom of Well: Some Silt	Type of Pump: Bladder
Screen Interval (ft): 17 - 23	Weather (sun/clear, overcast/rain, wind direction, ambient temperature):
Well Diameter (in): 4"	Clear, 60°, No wind
Placement of Pump (ft): 19.5'	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH ±0.1	Temp. (C) ±1°C	Cond. (umhos/cm) ±3%	ORP (mv) ±10	DO (mg/L) ±10%	Turb. (NTU) <10	Type, Size, and Amount of Sediment Discharged
915	15.28	0.2	0.0	6.41	20.15	861	297	4.94	24.2	
918	15.25	0.2	0.6	6.54	20.73	873	297	4.48	24.2	
921	15.25	0.2	1.2	6.59	20.98	879	297	4.35	27.3	
924	15.30	0.2	1.8	6.62	21.20	884	296	4.25	23.7	
927	15.30	0.2	2.6	6.64	21.29	885	296	4.22	22.4	
930	15.30	0.2	3.2	6.65	21.37	887	296	4.18	18.2	
933	15.30	0.2	3.8	6.66	21.50	889	295	4.17	15.0	
936	15.30	0.2	4.4	6.66	21.55	890	295	4.16	11.8	
939	15.30	0.3	5.0	6.67	21.59	891	294	4.16	10.5	
942	15.30	0.4	5.9	6.67	21.68	892	294	4.15	8.67	
945	15.30	0.4	7.1	6.67	21.68	892	293	4.15	7.43	
948	15.30	0.4	8.3	6.68	21.72	893	292	4.15	6.65	
950	Collect samples									

Observations

Color: (Clear) Other (describe):

Odor: (None) Low Medium High Very Strong H2S Fuel-like

Notes:

Signed/Sampler(s): J Wall, C. Williams

524 263
LOS ESC

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: WHGLTA020	Location: NAS Fort Worth JRB
Sampler(s): J. Wallace, C. Williams	Project Name: ~~DO~~ Plume Delineation
Well Depth: 14.9'	Project #: AFC 001 19 CCD Date: 11-4-99 Time: 1540
DTW (ft): 11.9' DTP (ft): —	Courier: ✓ FedEx ___ UPS ___ Hand ___ Other
MP Ht. Above/Below Ground Surface: 0	Sampling Method: Grab
Condition of Bottom of Well: Fine	Type of Pump: Bladder
Screen Interval (ft): 5 - 15	Weather (sun/clear, overcast/rain, wind direction, ambient temperature):
Well Diameter (in): 2"	Clear, 78°, Slight wind from SE
Placement of Pump (ft): 13.4'	

Field Parameters

Time	Depth to Water (ft)*	Flow Rate (L/m)	Total Volume (L)	pH	Temp. (C)	Cond. (umhos/cm)	ORP (mv)	DO (mg/L)	Turb. (NTU)	Type, Size, and Amount of Sediment Discharged
1546	—	0.2	0.0	6.73	22.28	987	204	3.62	229	
1549	—	0.4	0.6	6.72	22.19	978	209	3.58	~~12~~	
1552	—	0.3	1.8	6.72	22.16	977	211	4.37	1237	* Bubbles in water tube, Shut off pump for 10 min. Unable to lower pump.
1610	Purged well dry.**									

Observations

Color: Clear Other (describe):

Odor: None Low Medium High Very Strong H2S Fuel-like

Notes: * Unable to measure DTW, ~~below~~ water level below top of pump.

** Allowed over night recovery after purging well dry, returned following day, 11-5-99, and sampled well with bladder pump but did not attempt to stabilize parameters.

Signed/Sampler(s): C. Williams Jr.

524 264

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: WHGLTA022	Location: NAS Fort Worth JRB
Sampler(s): C. Williams / J. Wallace	Project Name: ~~BC 19~~ Plume Delineation
Well Depth: 32.58'	Project #: AFC 001 19 CCD Date: 11/3/99 Time: 1555
DTW (ft): 23.16 DTP (ft): —	Courier: X FedEx ___UPS ___Hand ___Other
MP Ht. Above/Below Ground Surface: 2" Ø	Sampling Method : GRAB
Condition of Bottom of Well: silty	Type of Pump: Bladder
Screen Interval (ft): 17 - 32	Weather (sun/clear, overcast/rain, wind direction, ambient temperature): Sunny, clear, wind from South, 60°
Well Diameter (in): 2	
Placement of Pump (ft): 27.9	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH ±.1	Temp. (C) ±1°	Cond. (umhos/cm) ±3%	ORP (mv) ±10	DO (mg/L) ±10%	Turb: (NTU) <10	Type, Size, and Amount of Sediment Discharged
1608	23.15	0.1	0	6.75	20.59	579.0	202.6	6.51	436.0	
1613	23.15	0.25	1.25	6.73	20.53	579.0	213.7	6.27	534.0	
1618	23.15	0.25	2.50	6.74	20.47	578.0	218.3	6.29	415.0	
1623	23.15	0.25	3.75	6.75	20.45	577.0	224.0	6.45	1124.0	
1628	23.15	0.25	5.00	6.77	20.46	575.0	228.9	6.47	1412.0	
1633	23.13	0.3	6.50	6.77	20.42	577.0	231.5	6.48	1320.0	
1638	23.13	0.3	8.00	6.77	20.41	577.0	234.4	6.44	1150.0	
1643	23.13	0.3	9.50	6.77	20.39	577.0	237.5	6.39	938.0	
1648	23.13	0.3	11.00	6.77	20.37	577.0	241.8	6.36	726.0	
1653	23.13	0.3	12.50	6.76	20.38	577.0	243.5	6.32	485.0	
1658	23.13	0.3	14.00	6.76	20.36	576.0	245.5	6.29	367.0	
1703	23.13	0.3	15.50	6.76	20.36	576.0	248.4	6.28	299.0	
1708	23.13	0.4	17.50	6.76	20.36	576.0	250.2	6.27	244.0	
1713	23.13	0.4	19.50	6.76	20.34	576.0	253.1	6.26	171.4	
1718	23.13	0.4	21.50	6.76	20.35	576.0	255.6	6.25	157.3	
1723	23.13	0.4	23.50	6.76	20.34	576.0	257.6	6.25	133.7	

Observations

Color: Clear Other (describe): cloudy

Odor: (None) Low Medium High Very Strong H2S Fuel-like

Notes:

Signed/Sampler(s): (Signatures on next page)

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: ~~WHGLRW019~~ WHGLTA022	Location: NAS Fort Worth JRB
Sampler(s): C. Williams/J. Wallace	Project Name: ~~DC~~ Plume Delineation
Well Depth: 32.58	Project #: AFC 001 19 CCD — Date: 11/3/99 Time: 1555
DTW (ft): 23.16 DTP (ft): —	Courier: X FedEx ___UPS ___Hand ___Other
MP Ht. Above/Below Ground Surface: 2"	Sampling Method: GRAB
Condition of Bottom of Well: silty	Type of Pump: Bladder
Screen Interval (ft): ~~17 - 29~~	Weather (sun/clear, overcast/rain, wind direction, ambient temperature): sunny, clear, wind from south, 60°
Well Diameter (in): 2	
Placement of Pump (ft): 27.9	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH	Temp. (C)	Cond. (umhos/cm)	ORP (mv)	DO (mg/L)	Turb. (NTU)	Type, Size, and Amount of Sediment Discharged
1728	23.13	0.4	25.50	6.76	20.33	576.0	259.6	6.25	113.7	
1733	23.13	0.45	27.75	6.76	20.32	576.0	261.4	6.24	96.60	
1738	23.13	0.45	30.00	6.75	20.32	576.0	263.2	6.24	81.40	
1741	23.13	0.45	32.25	6.75	20.31	576.0	264.8	6.23	70.90	
1748	23.13	0.45	34.50	6.75	20.29	573.0	265.0	6.23	60.40	

Observations

Color: Clear Other (describe): Cloudy

Odor: (None) Low Medium High Very Strong H2S Fuel-like

Notes:

Signed/Sampler(s): C. Williams, J. Wall

524 266

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: ~~DUP01~~ WHGLTA023	Location: NAS Fort Worth JRB
Sampler(s): J. Wallace, C. Williams	Project Name: ~~DO19~~ Plume Delineation
Well Depth: 28.69'	Project #: AFC 001 19 CCD Date: 11-4-99 Time: 1130
DTW (ft): 17.75' DTP (ft): —	Courier: ✓ FedEx ___ UPS ___ Hand ___ Other
MP Ht. Above/Below Ground Surface: 0	Sampling Method: Grab
Condition of Bottom of Well: Silty	Type of Pump: Bladder
Screen Interval (ft): 9'- 29'	Weather (sun/clear, overcast/rain, wind direction, ambient temperature):
Well Diameter (in): 2"	Clear, Wind from SE, 65°
Placement of Pump (ft): 23.0'	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH	Temp. (C)	Cond. (umhos/cm)	ORP (mv)	DO (mg/L)	Turb. (NTU)	Type, Size, and Amount of Sediment Discharged
1136	17.75	0.2	0.0	6.80	20.81	776	245	6.51	220	
1141	17.75	0.2	0.6	6.76	20.87	779	248	5.48	223	
1146	17.75	0.2	1.2	6.76	20.81	779	250	5.37	222	
1151	17.75	0.4	2.4	6.75	20.73	777	252	5.28	154	
1156	17.75	0.5	3.4	6.75	20.70	776	253	5.27	126.5	
1201	17.70	0.5	4.4	6.74	20.69	776	253	5.29	98.8	
1206	17.75	0.4	5.6	6.74	20.75	777	253	5.31	54.4	
1211	17.75	0.4	6.8	6.74	20.73	777	253	5.31	46.7	
1216	17.75	0.4	8.0	6.74	20.71	776	253	5.31	34.3	
1221	17.75	0.4	9.2	6.74	20.72	777	253	5.32	26.7	
1226	17.75	0.4	10.4	6.74	20.75	777	253	5.33	18.94	
1231	17.75	0.45	11.8	6.74	20.77	777	252	5.33	14.55	
1236	17.75	0.4	13.0	6.74	20.75	777	252	5.33	9.88	
1241	17.75	0.4	14.2	6.74	20.76	777	251.6	5.35	9.64	
1246	17.75	0.4	15.4	6.73	20.77	777	250	~~5.33~~ 5.35	10.27	
1251	17.75	0.4	16.6	6.73	20.78	778	249	5.35	9.44	
1256	17.75	0.4	17.8	6.73	20.77	777	248	5.36	8.49	
1301 ~~1300~~	17.75	0.4	19.0	6.73	20.80	778	247	5.37	7.87	

Observations

Color: (Clear) Other (describe):

Odor: (None) Low Medium High Very Strong H2S Fuel-like

Notes:

1305 Collect samples

Signed/Sampler(s): C. Williams, J. Wall

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: WHGLTA023	Location: NAS Fort Worth JRB
Sampler(s): C. Williams / J. Wallace	Project Name: ~~DO 19~~ (CW) Plume Delineation
Well Depth: 28.68	Project #: AFC 001 19 CCD Date: 11/2/99 Time: 1430
DTW (ft): 17.75 DTP (ft): —	Courier: X FedEx ___ UPS ___ Hand ___ Other
MP Ht. Above/Below Ground Surface: 0	Sampling Method: GRAB
Condition of Bottom of Well: slightly soft	Type of Pump: BLADDER
Screen Interval (ft): 9 - 29	Weather (sun/clear, overcast/rain, wind direction, ambient temperature):
Well Diameter (in): 2	Sunny / clear, slight breeze from west, 55°
Placement of Pump (ft): 20.22	

Field Parameters

Time 1445	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH ±.1	Temp. (C) ±1	Cond (umhos/cm) ±3%	ORP (mv) ±10	DO (mg/L) ±10%	Turb (NTU) <10	Type, Size, and Amount of Sediment Discharged
4" ~~245~~	17.75	.2	0	6.83	19.57	877.0	199.7	5.67	377.0	
1448	17.76	.2	.6	6.79	19.68	896.0	207.8	5.35	373.0	
1451	17.76	.2	1.2	6.79	19.94	885.0	212.6	5.23	390.0	
1456	17.76	.2	2.2	6.79	19.92	885.0	220.9	5.16	341.0	
1501	17.76	.2	3.2	6.79	19.98	883.0	227.8	5.17	322.0	
1506	17.76	.2	4.2	6.79	20.01	883.0	232.8	5.19	291.0	
1511	17.76	.2	5.2	6.79	20.01	883.0	236.8	5.16	244.0	
1516	17.76	.2	6.2	6.79	20.07	884.0	242.3	5.11	180.4	

Observations

Color: Clear (Other) (describe): murky

Odor: (None) Low Medium High Very Strong H2S Fuel-like

Notes:

Signed/Sampler(s): J. Wallace / C. Williams

524 268

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: WHGLTA025	Location: NAS Fort Worth JRB
Sampler(s): J. Wallace, C. Williams	Project Name: ~~DO 15~~ Plume Delineation
Well Depth: 21.35'	Project #: AFC 001 19 CCD Date: 11-5-99 Time: 835
DTW (ft): 16.35' DTP (ft): —	Courier: ✓ FedEx ___ UPS ___ Hand ___ Other
MP Ht. Above/Below Ground Surface: 0	Sampling Method: Grab
Condition of Bottom of Well: Good	Type of Pump: Bladder
Screen Interval (ft): 10.5 - 20.5	Weather (sun/clear, overcast/rain, wind direction, ambient temperature):
Well Diameter (in): 2"	Clear, 68°
Placement of Pump (ft): 18.85'	

Field Parameters

Time	Depth to Water (ft)*	Flow Rate (L/m)	Total Volume (L)	pH	Temp (C)	Cond. (umhos/cm)	ORP (mv)	DO (mg/L)	Turb. (NTU)	Type, Size, and Amount of Sediment Discharged
847	—	0.2	0.0	6.65	20.84	372	247	6.04	102.2	
850	—	0.1	0.6	6.73	20.87	373	244	4.46	85.0	
853	—	0.1	0.9	6.77	20.76	373	243	4.40	63.7	
856	—	0.1	1.2	6.80	20.96	376	243	4.40	50.0	
859	—	0.1	1.5	6.82	20.95	377	242	4.39	40.8	
902	—	0.1	1.8	6.83	20.94	377	241	4.38	32.2	
905	—	0.1	2.1	6.83	~~32~~ 20.96	377	241	4.37	29.8	
908	—	0.1	2.4	6.84	21.06	380	240	4.36	23.9	
911	—	0.1	2.7	6.85	21.09	380	239	4.35	20.9	
914	—	0.1	3.0	6.85	21.10	381	238	4.35	17.82	
917	—	0.1	3.3	6.85	21.18	382	237	4.35	16.29	
920	—	0.1	3.6	6.85	21.29	383	236	4.35	14.0	
923	—	0.1	3.9	6.85	21.32	384	235	4.37	13.1	
926	—	0.1	4.2	6.85	21.34	384	235	4.37	11.64	
929	—	0.1	4.5	6.85	21.31	384	233	4.36	9.35	
932	—	0.1	4.8	6.85	21.28	384	233	4.37	9.06	
935	—	0.1	5.1	6.85	21.36	385	232	4.39	8.73	
940	Collect samples									

Observations

Color: (Clear) Other (describe):

Odor: (None) Low Medium High Very Strong H2S Fuel-like

Notes: * Unable to measure DTW; water level is below the top of pump.

Signed/Sampler(s): C. Williams, J. Wall

APPENDIX C.5
1999 SOUTHERN LOBE TCE PLUME DELINEATION
FIELD NOTES

524 270

NAS Fort Worth JRB

METRIC CROSS SECTION BOOK

MCB 02

Dallas Fieldbook

R-1

Sheet 1

6/15/89 Cloudy, warm (85°), breezy (NW) Brad Welsey

630 Drillers arrive on site. Deposit drums in area for treatment area. Move to F.D.W. Decon area and set up decon pad.

730 Leave site for day. No drilling today.

Brad Welsey — June 16, 1999 — Brad Welsey

0745 Arrive on-site
0800 Drillers arrive on-site. Conduct complete health and safety for new drillers (Environmental Drillers Inc.)
0815 Mob to Visitors Registration to obtain 60day visitor pass for two vehicles.
0830 Mobing to location in Navy Housing.
0900 Start Drilling
0910 Hit bedrock/refusal at 10.0' bgs. Leave boring open. A very thin, wet zone was reached at 7.7 to 8.7 feet bgs.
0950 Leave hole open. Break down rig. Helpers go to decon augers.
1000 Mobing to location at third tee box on golf course.
1020 Helpers return from deconing.
1025 Start drilling at well
1050 Reach total depth of 16.0'. Stop drilling at 14.0'. Helpers leave to pickup well material.
1120 Drillers helpers return with well supplies. Begin construction well. Use 10' of screen from 15.5 - 5.0'. Sand from 3.0 - 15.5.
1140 Helper leave to get more sand filter pack.
1215 Break for lunch. Drillers will meet at field house at 13:45.
1330 Drillers return from lunch.
1400 Mob to CAMP LEJEUNE
1440 Begin drilling.
1530 Stop drilling. Hit refusal (Bedrock) at 21.0' Bedrock is limestone. Water was not encountered. Drillers go to decon. Driller breaks down rig and clean up.
1630 Driller drops this boring location and the boring at the Navy housing area.
1700 Leave site for day.

6/16/99

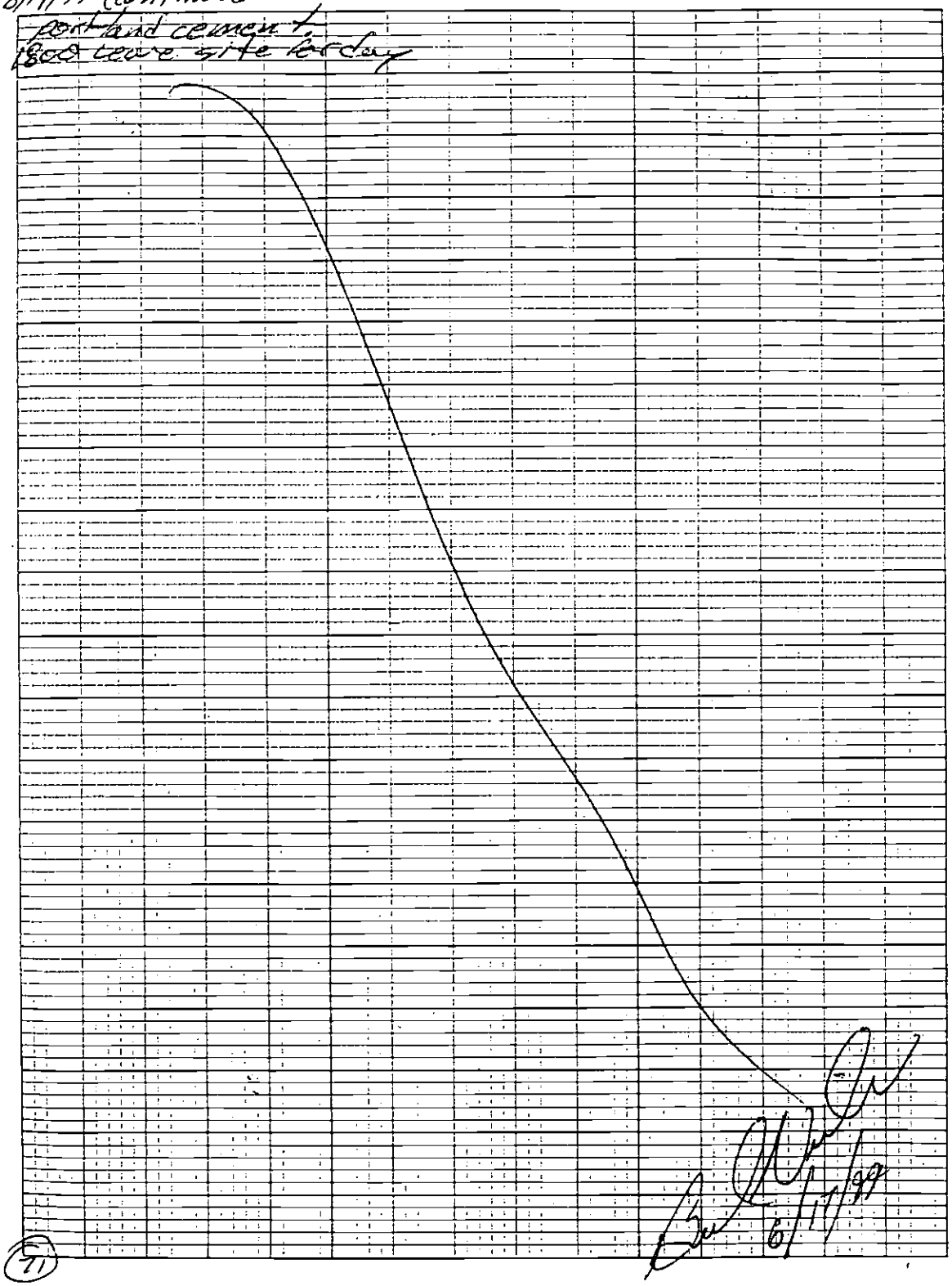
6/16/99

June 17, 1999 Cloudy, Mild (85°), breezy — Brad Weeks

0800 Arrive on site
0815 Drillers arrive on site. Conduct Health and Safety Briefing.
0830 Drillers run around picking up augers, dropping off generator, dropping off sand at well location
0920 Set up rig at WHG17A022.
0925 Begin drilling
1000 Stop drilling at 30'. Drillers need to decon additional split spoons.
1030 Drillers return and resume drilling
1050 Hit bedrock at 32.0 feet.
1100 Begin installation of well. Well is constructed of 15 ft of screen from 17-32' bgs. Riser to surface. Sand filter pack from 15-32 ft bgs. 2 ft bentonite seal from 13-15' bgs.
1135 Finish well construction activities. Helpers mobilize decon area and drilling crew breaks down rig. Drillers will break for lunch after deconing.
~~1300 Drillers return from lunch.~~ (N)
1145 Melanie calls to inform me that a water line was cut during DPT drilling at building 1750. Mob to building 1750.
1210 Public works arrives at building 1750 and they observe that a PVC water line was cut and that these lines were not marked properly. Navy public works will shut off water and repair. Leave site.
1225 Leave Building 1750 and return to field house and take lunch.
1300 Drillers return from lunch. Load supplies and mob to WHG17A023. Takes some maneuvering to set in between trees.
1330 Set up at boring location
1340 Begin drilling at WHG17A023.
1450 Sampler stuck in augers at 15'. After attempting to pull the sampler for 20 min, it was decided to remove the augers and refill this location.
1500 Helpers mob to decon area to decon augers
1520 Helpers return and resume drilling at WHG17A023
1650 Reach total depth of 210'. Hit bedrock at 20.0'. Immediately begin construction of well. Set 20 ft of screen because water column is approx 18 ft thick. 10 ft of riser to surface. Sand was placed to 7.0 ft below ground surface. Bentonite seal from 5-7 ft.
1730 Finish well construction activities. Tell drillers to bring 10 inch augers tomorrow morning so we could begin drilling the 4 inch wells. Also need to bring extra drums. First thing tomorrow we will scout these wells. Drillers were not prepared to begin grouting and did not come to site with

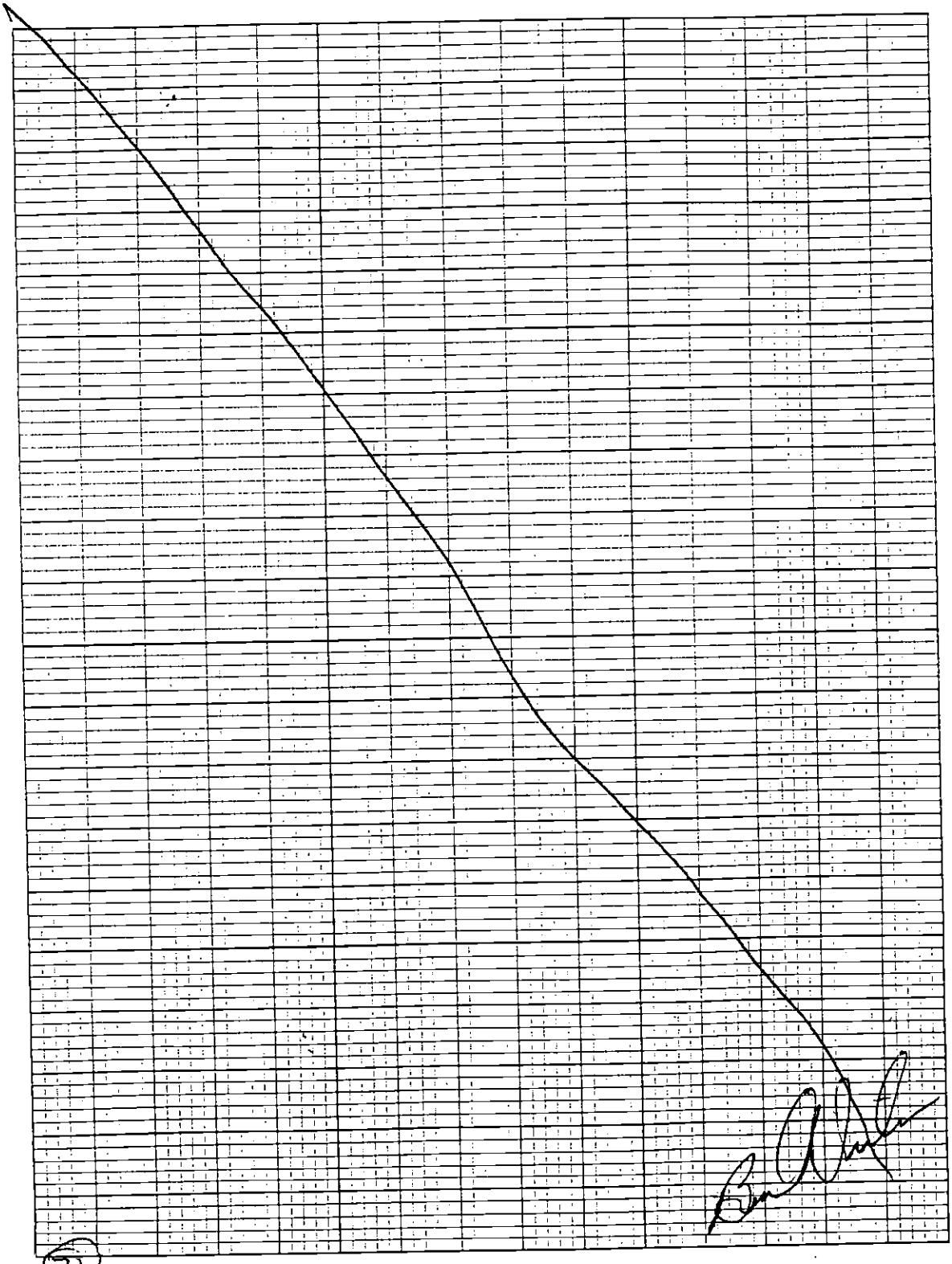
6/17/99 (continue
point and ce
1800 Leave s

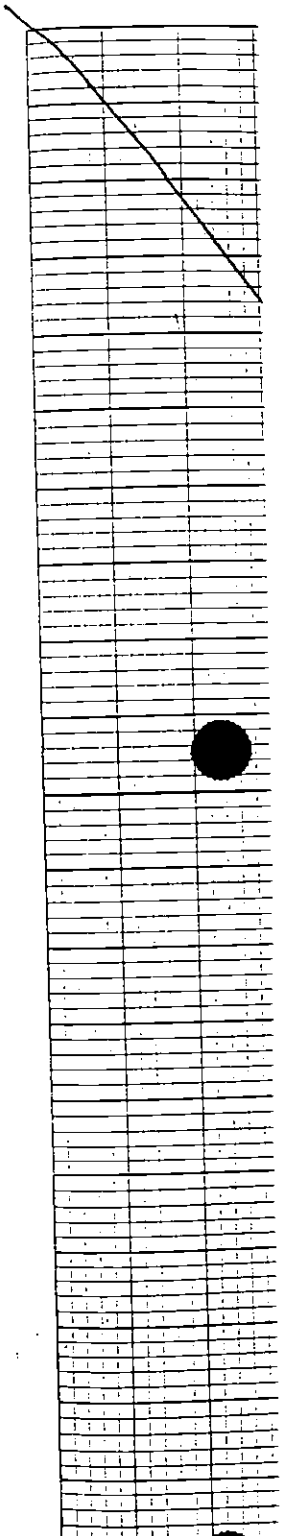
6/17/99 (continued)
portland cement
Bad cave site today



6/17/99

524 275





[redacted]

[redacted]

73

[redacted]

June 18, 1999 Partly Cloudy, Mild (85°), light breeze (NW) Brad Widser

0800 Arrive on-site.
0815 Drillers arrive. Conduct Health and Safety briefing w/ EPA members. Hel[illegible]
0830 Helpers leave field house to decontaminate equipment drums and pick up well supplies. Mobilize to Wheelwright.
0925 Begin drilling at Wheelwright.
0952 Reach total depth of 240'. Backfill at 240'. Roll the 8.0 inch augers (OD). Next the hole will be reamed out with larger 10 inch (OD) augers to hold hole at 40 inch well casing.
1140 Ream the 24" hole with the larger augers. Put together the screen and riser for the well.
1150 Sand appears to be locked in the augers and will not release. After attempting to release it a decision was made to remove augers and well casing and refill the hole. Another alternative was suggested. Augers are out casing is out. Helpers go to decon the augers, will also take back.
1245 Helpers return with degreed augers.
1315 Begin drilling at same location.
1500 Reach depth of 24' or Bedrock. Will attempt to reconstruct well with 15 ft of screen from ±41' to ±41'. A 10 ft riser from surface to 31'. Sand is placed from 31' to 24'. Bentonite seal from 5' to 26'.
1550 Finish well completion at Wheelwright. Drillers decon up area and finish pouring concrete pads at wells already installed.
1700 Leave site for day.

June 21, [illegible]
0800 Arrive on
0815 Drillers
[illegible]
0830 Begin
1110 Ream total
[illegible]
1415 Helpers
[illegible]
1430 Helpers
1440 Begin
1500 Reach
[illegible]
1545 Begin
[illegible]
1630 Helpers
[illegible]
1845 Leave

[redacted]

June 21, 1999 Overcast, Mild (70°), light breeze Brad Nelson

0800 Arrive on site.
0815 Drillers arrive on site. Conduct health and safety meeting.
0835 Drillers go to decon area to clean augers. Mobilize drill rig.
0930 Begin drilling at GMW-RW01S
1110 Reach total depth at location. Only three feet of saturated formation encountered therefore after discussing with Victoria Co (HGL) this well will be completed as a dry monitoring well with a well ID as GMW-RW-25.
1120 Begin constructing well with 10 ft of screen from 10 - 20.8 ft (total depth of boring). Riser to surface. Filter pack from 8 to total depth. Bentonite seal from 6 to 8 ft bgs. Grout to surface.
1215 Helpers drive to decon augers and breakfast with rig crew at 1312.
1430 Helpers return from lunch. Set up spot at GMW-RW03S
1440 Begin drilling at GMW-RW03S.
1530 Reach total depth of 26 ft. Pull augers and begin to overdrill with larger size augers to facilitate a 4 inch well construction.
1615 Begin constructing 4 inch well. Set 15 ft of screen from 13 - 28 ft bgs. Riser to surface. Set filter pack from 10 to 28. Bentonite seal from 8 - 10 ft bgs.
1800 Finish well construction activities. Break down, helpers have to pump down pit, drop off cement, etc.
1830 Helpers had left site without completing the pumping of decon pit and pulling up augers at well consistent with GMW-RW03S.
1845 Leave site for day.

June 22, 1999 (Cloudy, mid 80's), light breeze — Eric Nielsen

0800 Arrive on site. File paperwork, wait on drillers.
0900 Drillers come on site. Conduct health and safety meeting.
0915 Drillers, mob to pick up augers which were left at site yesterday and prompt decontamination which was not done yesterday. Mole Zyl not on site.
1045 Begin drilling at Willowbrook.
1130 Finish drilling at total depth of 24.0'. Groundwater reached at 17.0' bgs. Roll augers and ream hole with larger 10 inch OD augers.
1225 Stop over drilling. Reached 24.0'. Begin well construction. Well is constructed of 4 inch PVC. Screen from 14' to 24' bgs. Riser to surface. Sand filter pack from 10.8' to 24 ft bgs. Bentonite seal from 8.8 to 10.8.
1320 Finish well completion activities. Helper begin breaking down equipment and loading augers to transport to the decon area. Remainder of day will be spent setting well pads, pickup drums and grouting.
1800 Drillers still finishing up. Bud leave site for day.

Bud 6/24/99

June 24, 1999 Cloudy (Drizzle), 90°, light breeze (NW) Bob Wicker

0800 Arrive on site. Waiting on drillers.
0930 Drillers arrive on site. Conduct health & safety briefing with 4 SOE members
0945 Mob rig and crew to Landfill-1. Set rig up at OH6CTA104.
0945 Start drilling at OH6CTA104
1100 Stop drilling at OH6CTA104 at 40'. Drillers do not have enough bolts to fit on the augers. Drillers will leave site for day to pick up additional bolts and augers. Bad a Mary setup trailer house and break for lunch.
1215 Begin calibrating well water and pond truck to begin well development at DO11 wells.
1330 Mob to OH6CTA023
1340 Measure depth to water at 16.39 FTOC and total depth 28.58
1350 Begin surging with well development pump.
1405 Start pumping
1455 Stop pumping to repair pump
1525 Resume pumping
1532 Surge for 5 min.
1600 Take first reading
1711 Take final reading Turbidity = 9.4 NTU
Pack up
1800 Leave site for day.

June 25, 1
0800 Arrive on
drillers.
0900 Drillers
0915 Drillers
Begin
1100 Drillers
augers
a decision
column
with the
1110 Begin

June 28, 1989 Cloudy, Hot (22°), windy (NW) Brad Wiebsey

0700 Arrive onsite. Load truck and prepare for well development at off base wells.
0730 Gather the officers onsite. Calibrate instruments.
0815 Conduct health and safety meeting.
0820 Move to WHGCRW01. Set up equipment for well development.
0830 Measure depth to water = 13.80 TD = 23.68 PID = 0
0855 Start pumping after surging for 5 minutes with the well development pump.
1135 Stop pumping. Parameters stabilize. Breakdown equipment.
1150 Leave site. Break for lunch.
1245 Return from lunch. Pick up team from accuracy.
1300 Arrive at WHGCRW015. Set up well development equipment.
1320 Measured depth to water = 13.78 TD = 23.10
1400 Start pumping after 7 minutes of surging.
1510 Stop pumping at WHGCRW015. When surging well with pump, large amounts of fine grained sand are discharged with purge water. This suggests that the end cap may have broken and is allowing sand into the well. Breakdown equipment and move to different location.
1545 Talk with Mark Zyblot. He will send a person out in the morning to try and determine whether the end cap has broken.
1550 Set up equipment at WHGCRW018.
1600 Measure depth to water = 16.86 TD = 26.74 PID = 0
1620 Surge well with development pump for 7 minutes.
1627 Start pumping. Very silty water.
1850 Stop pumping. Parameters have stabilized. Turbidity was not able to lower below 5 NTUs however a 10% over three reading rule was used.
1900 Load truck and return to Shell house.
1920 Leave site for day.

6/28/89

June 28, 1998. Cloudy, hot (99°) windy (NW) · Brad Wiebsey

0710 Arrive on site w/ Catherine Williams. Perform calibration on instruments. Load truck for well development activities at offsite wells.
0810 Mob to WHPCTA022. Set up equipment
0820 Measure depth to water = 21.88 TD = 32.5 PID = 0
0834 Begin pumping after surging for 7 minutes.
1100 Continue to surge well and pump. Very silty and does not clean up very well. Low recovery. Try lowering pump rate.
1345 Parameters stable. Turbidity gets down to 24.4 NTUs and shut in 10 gal. Pick up truck
1400 Break for lunch.
1500 Return from lunch. Mob to WHPCTA025.
1630 Measure depth to water = 15.76 TD = 21.32 PID = 0
1645 Start pumping after surging for 5 minutes.
1850 Stop pumping well & collect WQ's. Parameters stabilized. Load truck. Return to fieldhouse.
1730 Leave site for day.

6/29/98

June 30, 1999 Mostly Cloudy, Hot, (95°) Cathy Williams

0720 Arrive on site with Brad Nielsen. Calibrate equipment, load vehicle.
0800 Health and Safety Meeting, leave field office
0820 Arrive at WHGLTA 104.0 Set up equipment, decon pump.
0830 Open wellhead. OVM = 2.0, 0.0 in BZ
DTW 31.9' TD: 45.4'
0840 C. Williams surge well for 15 minutes while B. Nielsen walks to decon area to obtain drum for waste water.
0900 Begin purging well.
0930 Temporarily stop purging well to take B. Nielsen off site to meet with Mark Sepblock, Environmental Drillers, Inc.
1000 Begin purging well again. Well did not recover very well. Stop purging several times to allow water to recover.
1210 Stopped purging well. The water did not clear up but the recovery rate was so poor that sufficient development was not possible. Packed equipment
1225 Demobed from location, break for lunch.
1330 Return to field office. Put new supplies in field office that was delivered today. Make phone calls.
1400 Arrive at WHGLTA020. Set up equipment.
1415 Open wellhead. OVM = 1.6 at wellhead, 0.0 in BZ
DTW 11.38' TD: ~~13.150~~ 14.90
1430 Begin pumping well after surging for 5 minutes.
1455 Pump making sucking, stop purging well. Pack equipment.
2010 Demobe from site. Take ~~drum~~ water to farm tank in IDW disposal area. Custody seal on well #481600
2020 Arrive at field house. Unload equipment. B. Nielsen went to IDW storage area to collect water sample from poly farm tank.
2045 B. Nielsen returns to field house. Clean up field house and equipment.
2115 Leave site for the week.

Cathy Williams

August 16, 19
0800 Arrive on s
0830 Briefing
meeting
1200 Break for
1300 Return from
samples fo
1345 Begin dr
1415 Collected
filter
1425 Collected
1445 Collected
1500 Collected
1505 Collected
1550 Collected
1700 Collected
1750 Collected
1800 Filter pa
1820 Pack equip
1900 On-site tru
1920 Leave site

7-7-99 Sunny hot, 95° F

700 At F-12 Calibrate had ran HRS
830 Leave for WHCLRW019
845 PID 02.0 DTW = 19.21 TD = 23.72
900 Begin purging
924 Parameters stabilize
930 Collect sample WHCLRW019 0601
Seal # 0491600
945 Return to field House for well tests
1000 Move to WHCLRW018 PID = 7.2
DTW = 19.16 TD = 29.25 Return TD = 28.0
screen 12.5-27.5 Open to Intake = 22.75
1005 Begin purging
1006 Parameters stabilize
1015 Collect samples Seal # 0491601 + DU201
1045 Set up at WHCLRW023
DTW = 16.28 TD = 28.6 Screen 9'-29'
PID = 0
1315 Begin purging
1320 Pulled in low flow and begin purging
1450 Parameters stabilize
1452 Collect WHCLRW023 0601
1615 Recover pump & return to field House
#4951500 hours used out
1530 Return to field house to pack coolers
1615 Collect FERMO099
1640 Leave for 100 Area
1700 Leave Rose for day

7-8-99 Sunny, clear 95°F

700 Arrive @ Field House and pack coolers, vans, Calibrate equipment.
820 H&S meeting
835 Leave for site [illegible] PID = 21.9
DTW = 20.05 TD = 30.55 actual = 32.0
Screen 19-30' top of pump 28.5
835 Begin purging
900 Parameters stabilize (except turb. & DO)
955 Collect [illegible] 0001 & 1225 dup
1000 Seal # 481594
1015 Decon pump
1030 Return to field house
1040 Leave for [illegible] PID = 0
DTW = 15.62 TD = 21.36 Screen 16.5-20.5
old seal # 481591 new seal # 481669
1105 Begin purging
1152 Parameters stabilize
1155 Collect samples [illegible]
final DTW = 15.70
1200 Decon pump
1215 Pick up water & drinks from Riverhawks
1300 Call Lynn
1310 Leave for [illegible] PID = 0
DTW = 11.8 TD = 14.9 Screen 5-15'
pump = 13.4 seal 481600 new seal 481601
1412 Parameters stabilize, drop DO
1415 Collect [illegible] final DTW = 11.9
1430 Decon pump
1445 Return to field house, pack coolers
1530 Called [illegible]
1630 Stop air IDW
1635 Leave for day

7-9-99 Sunny, clear 95°F

700 Arrive @ Field House calibrate equipment load vans

740 Health & Safety meeting

800 Leave for Base

815 Gage [illegible] PID = 9.18 TD = 9.18

Seal # 0084619 Ready [illegible] 0084618

830 Pick up radio & head to [illegible]

PID = 2000 DTW = 8.95 TD 11.85

pump intake = 10.3 BZ = 0

933 Parameters Stabalize

935 Collect sample [illegible] PO WCHM1170614A1

1000 Leave for WTM14004 DTW = 8.95 13.65 TD = 11 16.95

PID = 2000

1015 Air compressor stops working

1110 Return to Base house try to cool compressor

1130-1230 Lunch

1230 Return to Field House

1245 Leave for WTM14004

1315 Compressor will not work

1330 Return to Field House pack cooler, complete paperwork

1430 Collect EB070999

1515 Leave to build product

See Free Product Field Book

8/17/99 Sunny, Hot (100°) Brad A Nelson

0700 Arrive on-site. Drillers are on-site.
0715 Conduct heat/heard safety briefing with drillers. Calibrate PID, load truck.
0725 Mob to location of WHGLRW016 at intersection of white settlement & Roaring Springs road.
0800 Begin drilling at WHGLRW016
0900 Reach total depth of 23.7' bgs. Reflagger and ream hole using 10" augers to facilitate construction of 4inch well.
1000 Begin overdrilling (ream) the boring hole.
1100 Begin construction of well. 10ft of screen from 13-23' sand filter pack from 11-23'. Bentonite seal from 9-11'. Grout to surface
1230 Well construction complete. Load augers.
1240 Break for lunch
1340 Return from lunch. Mob rig to WHGLRW017.
1415 Begin drilling.
1530 Reach total depth of 25'. DTW=16.0'. Reflagger.
1550 Begin reaming hole w/10" augers
1645 Begin setting well. Check 10ft of screen from 24.4 to 14.4. Sand from 12' to 14.4' filter from 14.4 to surface. Bentonite seal from 10-12.0'
1830 Drillers finish well completion at 1830hrs. Will grout the remaining space in WHGLRW016 & 017 before they leave today
1900 Leave site for day

8/17/99

8/18/97

0700 Arrive on site. Drillers on-site.
0715 Conduct health & safety briefing. Drillers then move to LF-1 to install flush mounted pads at wells CAR-101, 102, 103. Back filling from earlier work prior to this.
0800 Map to locations of wells which need to be plugged and abandoned. MW-20 is buried and will have to be excavated. WETCTA001 is under asphalt and will require some excavation to get under the asphalt. Return to field house.
0900 Leave field house to perform water level gauging on DOE wells

Time	Well ID	PID	DTW	TD	Comments
0905	CAR-RW9	0	18.02	—	pump well
0917	CAR-RW10	0	25.32	—	
0925	CAR-RW11	0	23.11	—	
0929	CAR-RW12	8.8	28.25	—	
0934	LF04-02	17.5	29.34	—	
0937	CAR-RW8	0	26.23		
0942	LF04-03	0	26.57	—	
0945	CAR-RW6	0	24.60	—	
0949	CAR-RW4	0	20.97	—	
0951	CAR-RW1	0	21.98	—	
0956	CAR-RW2	0	23.72		
1000	CAR-RW5	0	25.12		

Return to field house.
1015 Leave field house to measure DCDs at auto hobby shop and remove precipitation.
1120 Return to field house. Drillers completing pads at RW wells.
1200 Break for lunch.
1300 Return from lunch. Leave field house to inspect locations of wells which are to be abandoned. MW-20 and WETCTA001. MW-20 has been buried under dirt and could not be located. WETCTA00 is beneath pavement. Reported location of well.
1430 Attempt to inspect WETCTA033 however this well was beneath a parked car. Will attempt to do this later.
1600 Leave site for day.

8/18/97

Brad Nelsen

8/17/90

0700 Arrive on-site, begin calibrating instruments (well-head, PID, turbidimeter).
0730 Tom Dresselhaus on-site.
0830 Mob to [illegible]
0845 measure DTW 13.68 TD 23.3 PID = 19.7
0905 Begin surging well using well development pump
1345 Parameters stabilized. Turbidity 40 for 30 min.
Breakdown equipment and load truck
1415 Meet for lunch.
1530 Return from lunch. Jolly moves concrete from reconstruction of guardrails after 1-10 the westbound lanes, trash pile w/permission from Guy Robinson.
1615 Collect material blank [illegible] from VOA decontaminated water (ASTM type II) which was used for decontaminating equipment blanks.
1630 Prepare Trip Blank [illegible]. Pack samples for FedEx shipment to STL/Chicago.
1700 Leave site for day.

8/20/90

0700 Arrive on-site, [illegible]
0845 Mob [illegible]
0900 Set up [illegible]
0910 DTW [illegible]
0920 Set up [illegible]
0927 Start [illegible]
0947 Resume [illegible]
0953 Collect [illegible]
1015 Finish [illegible]
1032 Mob to [illegible]
1050 Mob to [illegible]
1055 Start [illegible]
1058 DTW [illegible]
1130 Start [illegible]
1204 Resume [illegible]
1210 Collect [illegible]
1235 Finish [illegible]
1250 Re[illegible]
1315 Begin [illegible]
1415 Return [illegible]
1430 Set up [illegible]
1435 DTW [illegible]
1440 Start [illegible]
1556 Continue [illegible]
1600 Pack [illegible]
1630 Collect [illegible]
1730 Leave [illegible]

8/24/99 Brad Wiedsey

0730 Arrive on site. Calibrate oxygen and DO and turbidity meters. Load truck. Conduct tailgate meeting and safety briefing.
0750 Mob to WELL RW07R
0815 DTW 15.73 TD 24.00 PID = 0.5
0820 Begin surging well with well development pump.
0841 Start pumping
1020 Parameters stabilized for 30 minutes. Stop pumping
1300 Begin for purchasing returning to field house and unloading the equipment.
1400 Return from purchasing. Load truck. Mob to RW07
1440 Start to set up at WELL TA-05
1445 DTW 19.52 TD 30.13 PID = 0.
1456 Start pumping
1521 Parameters stabilized over three readings
1535 Collect sample for WELL TA-05
1555 Finish sampling. Drain pump, load truck. Mob to WELL TA-07
1624 DTW 28.49 TD 36.63. PID = 0 ppm. Removed custody seal # 0481602
1640 Start pumping at WELL TA-07.
1650 Stop pumping to recalibrate dissolved oxygen. Return to field house. DO is showing a large negative #. Also recalibrating instrument is acting weird.
1750 Return to WELL TA-07
1830 Resume pumping.
1835 DO meter is still not reading correctly. Break down equipment, decon pump and load truck. Return to field house.
1920 Collect field QC Equipment Blank [CASE 23997]
1945 Leave site for day.

8/24/99

524 291

8/16/99 Brad Wilson

0815 Arrive on-site. Wait for well-head replacement. Review pump tests.
1030 Contractor arrives via Fedex. Perform equipment calibrations
1100 Mob to LP-9. Setup equipment at LWHC17A-204
1120 RTW - 28.53 TD - 36.83 PID - 70
1135 Start pumping.
1145 Stop pumping. Problem w/ DO sensor. Return to field house to pick up QED loaner.
1215 Return to LWHC17A-204.
1222 Resume pumping.
1300 Collect sample LWHC17A-204-GW
1325 Finish sampling. Replace custody seal w/ # 01994095
1350 Mob to LW-16 (RW01)
1355 DTW 13.78 TD 22.60 PID - 0
1400 Start pumping at LWHC17RW01
1438 Parameters stabilized over three readings.
1445 Collect sample LWHC17RW01GW-01
1500 Insert custody seal # 01994094
1509 Setup equipment at LWHC17RW01
1512 DTW 15.77 TD 23.98 PID = 0.0
1617 Parameters stabilized over three readings
1620 Collect sample LWHC17RW01GW-02
1710 Collect equipment blank # 1508 2694 for Appendix IX VOCs, SVOCs, + metals + Hg.
1750 Leave site for day. Return to Austin

8/16/99

524 292

September 13, 1999 Brad Wielsey

0700 Arrive on site w/ Cutler Williams from Austin. Rent sub pump and generator to conduct disposal of water in 1200 gallon poly tank.
0944 Move to IRM area and prepare to pump waste water.
0957 Start pumping from 1200 gallon poly tank into Manway #4 of base sanitary sewer system under authority of Karen McElroy at Navy Environmental. Approximately 1225 gallons are in tank at start of pumping.
1027 Finish pumping from 1200 gallon poly tank. Pump water from two smaller poly tanks and two 55 gallon drums. Perform product removal at Hobby shop.
1230 Break for lunch.
1330 Return from lunch. Observe sampling of influent and effluent at Groundwater treatment system.
1500 Calibrate instruments, perform maintenance on LFG monitoring wells.
1600 Leave site for day. Six samples collected today.

9/13/99

September 14, 1997 Clear, 85°, humid Catherine Williams

0715 Arrive on-site. Calibrate PID, well wind, and turbidity meter. Load truck. C. Williams and B. Nielsen on site.
0730 Prepare trip blank [T-B081497]
0745 Conduct health and safety meeting w/ C. Williams.
0800 Mob to WHGLRW015. Set up sampling equipment.
0805 Remove custody seal # 0482629.
0807 PID-858 ppm DTW 14.91 TD 23.06
0830 Start pumping.
0840 Start recording parameters.
0905 Parameters stabilized. Collect sample [WHGLRW015-02]
0915 Finish sampling. Breakdown equipment, decon pump. replace custody seal w/ # 0194007.
0942 Arrive at WHGLTA02C. Set up sampling equipment.
1000 Open wellhead. PID - 2000+ ppm,
DTW 12.23 TD 14.91, Custody Seal removed #0194178.
1009 Start pumping. Establish flow rate after 4 hrs but flows were taken as with water, was not able to establish flow rate, well was being pumped dry despite great efforts taken to use a low flow rate and trouble shoot possible pump problems.
1125 Remove pump from well, decon pump, demob equipment.
1145 Close well cap. Custody seal #0194006.
1200 Break for lunch.
1330 Arrive back at field office, reload supplies.
1340 Arrive at WHGLTA RW019, set up equipment.
Remove custody seal # 0481670.
PID - 528 ppm at wellhead, 0 ppm in BZ
DTW 14.96, TD 23.63, some silt at bottom of well.
lowered pump to depth of 19.3 ft.
1400 Begin purging well.
1402 Begin recording parameters
1420 Collect samples [WHGLRW019WG02] [WHGLRW019WG02MS] and [WHGLRW019WG02MSD]
1430 Close well cap, custody seal ~~#0194007~~ #0194005, decon pump, demob.
1440 Stop by field office
1515 Arrive at WHGLTA025. Remove custody seal #0194144.
PID 2000+ at wellhead, 0 ppm in BZ
DTW 16.40, 21.35 TD. Placed pump at 19.80'.
1530 Begin purging well. Establish flow rate of 0.1 L/min
1536 Begin recording parameters.

September 14, 1999, cont.

Catherine Williams

1620 Air compressor stopped working, probably overheated.
Changed with different compressor & started back up.
1630 Began purging well again, establish flow rate of 5 L/min
1650 Parameters stabilized, collect samples [WHG14025-WG2]
1655 Turn off pump, decrease equipment, decon pump.
Custody seal #194004. Last PID reading was 91.1 ppm
1715 Leave site, return to field office, unload equipment
1730 Take equipment home, pack samples
1745 Leave site for Day.

Sept

0720 Arri
mot
0740 Con
0750 Pre
0815 Arr
Cwo
DT
0835 Beg
DT
0843 Beg
0900 Fo
wc
0925 Con
Cwo
0935 Dec
0945 Sto
0955 Arr
Cw
DT
1010 Beg
1045 Co
1050
W
1055 De
1105 S
1110 A
1140 B
1250 C
1300
1315
1325
1435
1510

524 295

September 15, 1999 Clear, 85°

Catherine Williams

0720 Arrive at field house, pack equipment, calibrate instruments.
0740 Conduct Health & Safety Meeting led by Brad Nielsen.
0750 Prepare Trip Blank of TB091599.
0815 Arrive at WHGLTA104. Set up equipment. Remove custody seal #0194114. PID 1000 ppm at wellhead, 242 ppm BZ, DTW: 31.30, TD: 45.57
0835 Begin purging well. Establish flow rate of 0.15 L/min, DTW: 31.30
0843 Begin recording parameters.
0900 Parameters stabilized, collect samples. PID 135 at wellhead, 0.0 ppm in BZ. 10 gal DTW: 32.13 ft. Samples WHGLTA104WG02
0925 Complete sampling, pack equipment, decon pump, custody seal #0194003.
0935 Demobed from site. Buy ice at 7 Eleven.
0945 Stop by field office drop off ice.
0955 Arrive at WHGLTA901. Set up equipment. Remove custody seal #0194122. PID 1.7 at wellhead, 0.0 ppm BZ. DTW: 9.51 ft, TD: 22.02 ft. Lower pump to bottom of well. Turn pump and dry.
1010 Begin purging well.
1045 Complete purging well. Removed 9 gallons of groundwater. Final DTW 19.9 ft.
1050 Decon pump, load up equipment, locked well cover with custody seal #0194002.
1055 Demob from well.
1105 Stop by field office.
1110 Arrive at WHGLTA902. Pick up additional WC vials. Remove custody seal #0481594. PID 121 ppm at wellhead, 0.0 ppm in BZ. DTW: 22.71, TD: 32.53. Lower pump to ~~25.0 ft~~ 27.6 ft.
1140 Begin purging well. ~~Establish flow rate~~ of 0.10 L/min.
1250 Collect samples (WHGLTA022, WG02)
1300 Pack equipment, ~~disinfect pump~~, lock well with custody seal ~~#0194001~~ #0194001.
1315 Demobed from well.
1325 Return to field office, break for lunch.
1435 Return to field office, change fields on PID and calibrate.
1510 Arrive at WHGLRW018. Set up equipment. Remove custody seal #0481660. PID 0.0 ppm, Noah is acting funny - shaking, rush, cacophonous readings. DTW: 17.98, TD: 27.85, 3" of sediment. Tim Sewell NRCS/Environmental Investigation on site performing audit. Lower pump to 22.5 ft.

September 15, 1999, page 2 C. Williams

1545 Begin pumping well. Establish flow rate of 0.10 L/min.
1610 Parameters stabilized. Collect samples.
WHGC RW018-WG02.
1620 Decon pump, pack up equipment, lock well cap with custody seal #0194027.
1645 Demobed from well. Tim Sewell leaves site for day.
1655 Return to field office. Unload equipment.
1700 Prepare equipment blank sample EB0915991.
Pack samples.
1815 Leave site for day.

C. Williams
9/15/99

September 16, 1999 — Catherine Williams

0730 Arrive at the field office. C. Williams calibrated instruments, B. Nielsen went to IDW Storage Area Base to pick up a drum, brought the drum to the Groundwater Treatment System area off Base and disposed of yesterday purge & decon waters in the drum at the Treatment area.
0820 Conducted Health & Safety Meeting by B. Nielsen.
0840 Arrive at WHGLTA001 & set up equipment. Remove custody seal # 0194026.
0845 B. Nielsen returned to field office to retrieve additional equipment.
0855 Open wellhead, PID: 113 at wellhead 4.5 in BZ, DTW: 16.63, TD (from yesterday) 23.02 ft. Lower pump to 19.3 ft. Removed pump, leaving that 9.96 recovery was necessary to sample well and this was not achieved. Loaded up equipment, locked well with custody seal #0194036.
0915 Demobed from well.
0925 Arrive at WHGLRW019. Set up equipment, decon pump.
0940 Open wellhead, remove custody seal # 0194094. PID: 2,000+ at wellhead, 80 in BZ. DTW: 13.83 ft, TD: 22.58. Lower pump to 18.2 ft. Trace of silt on bottom of well.
0955 Begin purging well. Establish flow rate of 0.2 L/min.
1003 Begin recording parameters.
1040 Parameters stabilized, collect samples WHGLRW016 WG02 and Dup011. PID: 35.6 at WH, 0.0 in BZ.
1045 Decon pump, load up equipment. Lock well with custody seal # 0194022.
1105 Demobed from well.
1110 Arrive at WHGLTA023. Set up equipment. Remove NO custody seal - none present. PID: 91 at WH, 0.0 in BZ. DTW: 18.38, TD: 28.63 ft. Lower pump to 25 ft. 22.6 ft.
1135 Start purging well. Establish flow rate of 0.15 L/min.
1215 Parameters stabilized. Collect samples WHGLTA023-WG02
1220 Decon pump, load equipment. Lock well with custody seal # 0194011.
1240 Break for lunch.
1400 Arrive at WHGLRW017. Set up equipment. ~~Remove custody seal #~~ NO custody seal present. PID: 2000+, 0.0 in BZ, DTW: 15.85, TD: 23.92. Lower pump to 20 ft.
1435 Begin purging well. Establish flow rate of 0.10 L/min.
1525 Parameters stabilized, collect sample WHGLRW017-WG02.
1530 Pack up equipment, decon pump. Lock well with custody seal # 0194012.

1620 Check water level in WH6CTA01. Remove custody seal # 194036. DTW = 15.83. Replace custody seal w/ ~~# 194036~~ 194037. Dry purge to purging on 7/15/99 was 8.51 TD - 22.58. Water level recovered ~~to~~ approximately 55%. No sample will be collected until 85-90% recovery has been achieved.

1630 Well maintenance inventory on 2018 wells

well ID	cOC/lock	well condition	TOC Height	Comments
WH6CTA020	COC seal	very good	-0.30'	Flush mount
WH6CTA025	COC seal	very good	-0.30'	Flush mount
WH6CRW018	COC seal	very good	-0.20'	Flush mount
WH6CTA023	COC seal	very good	-0.40'	Flush mount
WH6CRW019	COC seal	very good	-0.25'	Flush mount
WH6CRW015	COC seal	very good	-0.60'	Flush mount
WH6CRW016	COC seal	very good	0.53'	Flush mount
WH6CRW017	COC seal	very good	-0.37'	Flush mount
WH6CTA022	COC seal	very good	-0.20'	Flush mount

1630 Collect equipment blank [EB0716 99]

1730 Leave site. Return to ASAM.

Nov 1, 91 Sunny, 60°

800 Arrive at field office, Calibrate equipment, load van.

850 Health & Safety Mtg conducted by B. Nielsen. Attended by J. Wallace, C. Williams.

1000 Arrive at WHGC RW018. Set up. Missing fittings for airhose and pump. Unable to locate fittings in field office.

1100 Return to field office. K. Tu on site to learn how to perform system sampling

1120 Prepare equipment for system sampling

1200 Collect effluent and influent samples EFF on INF W08

1230 Collect samples from each skid: AS1 W08, AS2 W08, AS3 W08, AS4 W08, AS5 W08, AS6 W08

1315 Pack sample, Prepare trip blanks.

1400 Break for lunch.

1430 Return to field office.

524 299

1510 Return to WHGLRW018.
Set up. Remove custody
Seal #0194027. PID: 0.0ppm
DTW: ~~18.11~~ 18.22', TD: 27.12'
Condition of bottom of well:
Soft, ≈3" of sediment.
Lower pump to 22.7'
Initial DTW: 18.19'
1510 Begin purging well. Establish
flow rate of 0.1 L/min.
605 Parameters stabilize. Collect
samples [WHGLRW018].
Decon pump, load van.
Lock well with Custody Seal
0402399.
1635 Return to field office.
1830 Dispose of purge and
decon water in gw treatment
system off-Base.
1840 Leave Site for day.

Cathi Gilman

Nov. 2, 1999 Clear, @ 55°

715 Arrive at field office,
Calibrate equipment, load
van, prepare for day's activities
750 Health and Safety Meeting
Conducted by B. Nielsen,
attended by J. Wallace,
C. Williams
815 Prepare trip blank [TB110299]
900 Arrive at WHGLTA901.
Set up. Remove custody
seal # 0194044.
915 Open wellhead. PID: 0.0ppm
DTW: 9.88', TD: 22.00'.
Placement of pump: 16.0'

933 Start purging well w/ flow rate of .05 L/min
94 Initial depth to water 10.10
1000 Start taking samples [WHGL901WG03]
1041 Final depth to water 12.40'
1041 Start to purge well dry.
1138 Complete purge of well
Decon pump, load van
Lock well w/ Custody Seal
0402398

524 300

1200 Dump purge water in poly tank at IDW storage area on DOSC.
1230 Break for lunch
1330 Resume sampling WG03
1400 Arrive at WHGLTA023 and set up
Remove custody seal # 019401
1410 Open well - water in casing above well
typ PID = 0.0 ppm pump placement 20.28
DTW = 17.75 ft
TD = 28.68 ft
1430 Start to purge well
Establish flow rate 0.2 L/min.
1518 High turbidity but all other parameters stabilized after 30 minutes, so began to collect samples. WHGLTA023WG03
1540 Decon pump, load van
lock well w/ custody seal # 0402331
1620 Arrive at WHGLTA104 WG03 and set up
Remove custody seal # 019403
PID 0.2 ppm pump placement 19.69 ft 354
DTW 31.4 ft
TD 45.31 ft

gw 55
1703 Start to purge well
Establish flow rate 0.2 L/min
1715 Parameters stabilized & WG03
Begin taking sample WHGLTA104
1740 Final depth of water 31.93 ft
Began cleaning pump, loaded van
Locked well w/ custody seal # 0402332 (needs new cap not secure)
gWall

524 301

Nov. 3, 1999 Clear 55°

0730 Arrive at field house, unload equipment, load van, and prepare for the day

0800 Health and Safety meeting conducted by Brad Kirsch, attended by J. Wood, C. Williams

0815 Contact Bosco Ramirez to notify of discrepancies on previous day's COC, prepared [1316599]

0915 Arrive at WHGLRW016 & set up.

0920 Decon pump from 11/2/99

0940 Open well & break custody seal # 0194012

PID 0.4 ppm TD 22.58 ft

DTW 13.92 ft

Placement of pump: 15.25 ft

0958 Start purging well w/ a flow rate of 0.15 L/min

1007 Start reporting parameters

1024 Parameters stabilized & begin to take sample [WHGLRW016W603] & re-establish flow rate of 0.15 L/min

1031 Final depth to water 13.92 ft.

1034 Begin to decon pump, load van & lock van - custody seal # 0194054

1116 Arrive & set up at WHGLRW017 & open well w/ custody seal # 0194013

DTW - 16 ft TD - 23.95 ft

PID - ~~0.00~~ 0.8 ppm

Placement of pump - 16.98 ft ≈ 1 ft

Silty bottom ≈ 2"

1130 Start purging well w/ a flow rate of 0.2 L/min

1142 Start reporting parameters

1145 Pump slipped during initial reporting of parameters to depth of 17 ft, water very murky

1255 Begin collecting samples [WHGLRW017W603] after establishing flow rate at 0.2 L/min

1300 Final depth to water 16 ft lock well, Custody # 0402348, Decon pump & load van

1350 Break for lunch

1430 Discuss turbidity issues with Miguette and organize paperwork, planning POA for next day's work & dispose of purge water @ system monitoring area

524 302

~~1630~~ 1530 Arrive at WHGL7AC22.
& set up, removing custody seal # 0194001
PID - 2.4 ppm TD - 30.58 ft
DTW - 23.16 ft Placement of pump - 27.9
bottom of pump - 24.9 ft, silty well bottom
1555 Start purging well with a
flow rate of 0.1 L/min
1611 Begin to stabilize field parameters
Turbidity is high so taking parameters
readings every 5 min.
1753 Take sample WHGL7AC22WG03 after all parameters stable except turbidity
1800 Final depth to water 23.1 ft
Close well, custody seal # 0402337
1810 Dispose of purge water off base
in system monitoring area.
1815 Return to field office to
prepare samples for FedEx &
complete paperwork.
1830 Leave site for day.

Gwall

Nov. 4, 1999 Clear, 65°
700 Arrive at field office,
load van, calibrate
equipment.
745 Prepare trip blank TB110499.
800 Health and Safety Meeting
conducted by C. Williams,
Attended by J. Wallace.
815 Arrive at WHGL RW019.
Decon pump. Set up.
845 Open wellhead.
PID: 0.0 ppm
DTW: 15.3 ft
TD: 23.79 ft, Some silt on bottom
Custody Seal # 0194005 removed
Lower pump to: 19.5 ft
905 Begin purging well.
Establish flow rate of 0.2 L/min
915 Begin recording parameters.
950 Collect samples WHGLRW019WG03, ~~WHGLRW019MS~~ and WHGLRW019MSD
WHGLRW019WG03MS and WHGLRW019WG03MSD
1010 Complete sample collection.
Pack equipment, decon pump
Final DTW: 15.29 ft.
Lock with custody seal # 0402~~335~~ 342.

524 303

Nov. 4, 1999, cont.

1045 Arrive at WHGLTA023.
Set up. Remove Custody
Seal #: 0402331
PID: 0.0 ppm
DTW: 17.75'
TD: 28.69'.
Accidentally drop pieces of plastic in well. Successfully fished it out, lower pump to 23'.

1130 Begin purging well.
Establish flow rate of 0.2L/min

1135 Begin recording parameters.

1305 Collect samples WHGLTA023WG03.

1315 Complete sample collection, Pack equipment, decon pump, lock well with custody seal #0402334

1340 Break for lunch

1430 Dispose of purge water in gw treatment system.

1515 Arrive at WHGLTA020.
Remove custody seal #0481665.
PID: 0.0 ppm
DTW: 11.9'
TD: 14.9'
Lower pump to 13.4'.

Nov 4, 1999, cont.

1540 Begin purging well.
Establish flow rate of 0.2L/min

1552 Air bubbles detected in water tube. Shut down pump to allow the well to recharge.

1600 Telephoned Lynn Morgan, HGL, to discuss situation. She suggested lowering pump just above bottom of well and purging dry.

1610 ~~This~~ @ Purged well dry.

1640 Decon'd pump.
Lock well with custody seal # 0402394.
~~Decon pump~~ @

1700 Arrive at WHGLRW015.
Set up. Remove custody seal # 0194007
PID: 0.0 ppm
DTW: 15.1'
TD: 22.3'

1715 Prepare equipment blank EB110499.

1725 Lower pump to 19.2'

524 304

Nov 4, 1999, cont.

1730 Begin purging well.
Establish flow rate of
0.4 L/min.

1742 Begin recording parameters

1825 Collect samples
WHGLRW015WG03 and
Dup 01 WG03

1840 Lock well with custody
seal #0402396.

1845 Return to field office.
Pack samples for shipping

1940 Leave Site for day.

Cathie Willey

524 305

Nov 4, 1999, cont.

1730 Begin purging well.
Stabilish flow rate of
0.4 L/min.

1742 Begin recording parameters

1825 Collect samples
[WHGLRW015WG03] and
[Dup 01 WG03]

1840 Lock well with custody
seal # 0402396.

1845 Return to field office.
Pack samples for shipping

1940 Leave Site for day.

Cathie Williams

Nov 5, 1999 Clear, 68°

700 Arrive at field office.
Calibrate equipment.

715 Load van, prepare trip
blank [TB110599].

745 Conduct Health & Safety
Mtg by C. Williams,
Attended by J. Wallace.

800 Arrive at WHGLTA025.
Decon pump. Set up.

820 Open wellhead.
Remove custody seal
0194004
PID: 0.0 ppm
DTW: 16.35'
TD: 21.35'
Lower pump to 18.85'.

835 Begin purging well.

940 Collect samples
[WHGLTA025WG03].

950 Complete sample collection.
Decon pump. Lock well with
custody seal # 0402395.

955 Compressor stalled.
Return to field house
to get spare compressor

524 306

Nov 5, 1999, cont.

1010 Complete decon of pump

1020 Arrive at WHGLTA020.

1030 Collect equipment blank

EB110599

1040 Open wellhead.

PID: 0.0 ppm

DTW: 11.95'

TD: 14.9'

Remove chain of custody

0402394

Lower pump to 13.5'.

1055 Begin purging well

Flow rate 0.1 L/min.

Collect samples WHGLTA020WG03

1100 Complete sample collection.

Decon pump.

Lock well with custody

seal # 0402317

1130 Dispose of purge and decon

water at gw treatment system

1135 Return to field office.

Unload van, pack samples

1230 Leave Site for Day.

Arthur Willis

524 307

Nov. 5, 1999, cont.

1010 Complete decon of pump
1020 Arrive at WHGLTA020.
1030 Collect equipment blank
EB110599
1040 Open wellhead.
PID: 0.0 ppm
DTW: 11.95'
TD: 14.9'
Remove chain of custody
#0402394
Lower pump to 13.5'.
1055 Begin purging well.
Flow rate 0.1 L/min.
Collect samples WHGLTA020WG03
1100 Complete sample collection.
Decon pump.
Lock well with custody
seal #0402347
1130 Dispose of purge and decon
water at gw treatment system
1135 Return to field office.
Unload van, pack samples
1230 Leave Site for Day.

Cathy Wilson

Nov. 5, 1999 Sunny 75° Brad Nielsen
1415 Arrive at field house to conduct
system sampling at pumps.
1435 Turn wells RW6 and RW12
on to circulate water.
1442 Sample RW1, two 40ml bottles
1446 Sample RW9, two 40ml bottles
1453 Sample RW5, two 40ml bottles
1456 Sample RW8, two 40ml bottles
1458 Sample CF04-3, two 40ml bottles
1501 Sample RW11, two 40 ml bottles
1506 Sample RW10, two 40ml bottles
Dup collected from RW10
1514 Sample RW2, two 40ml bottles
Unpreserved collected.
1518 Sample RW4, two 40ml bottles
1527 Sample RW6, two 40ml bottles
Unpreserved bubbles in samples
seen to be unavoidable.
1532 Sample RW12, two 40ml bottles

Fill out paper work, pack
coolers for FedX
leave site @ 1640

Brad Nielsen

524 308

APPENDIX C.6
1999 SOUTHERN LOBE TCE PLUME DELINEATION
FIELD SAMPLING REPORTS

524 310 C ASP

HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB, Texas

PROJECT: AFC001-~~26 HAA~~ 19CCD

SITE: Off base

SAMPLE INFORMATION

SAMPLE ID: ~~WH6LTA~~ WH6LRW015WG01

DATE: 7/28/99 TIME: 1608

MATRIX TYPE: WG

SAMPLING METHOD: Bladder pump

LOT CONTROL #: 0 1 1 1

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

BEGINNING DEPTH: _____ N/A _____

END DEPTH: _____ N/A _____

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR BLANKS/QC SAMPLES ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB072899

TRIP BLANK (TB): TB072899

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40m/VOA	3	HCL pH<2, 4°C	8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	0	COLOR: clear	
2nd	0	ODOR: none	
		OTHER:	

pH 6.32 Temperature 23.05°C Dissolved Oxygen 2.80mg/L Specific Conductivity 857 uhmos/cm

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN _____ WIND DIRECTION N AMBIENT TEMPERATURE 100°F

SHIPMENT VIA: FED-X X HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: STL

COMMENTS:

SAMPLER: Brad Nielsen OBSERVER:

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BR=BRASS RING	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	CS=COMPOSITE SAMPLE	H=HOLLOW STEM AUGER
SH=HAZRDOUS SOLID WASTE	WS=SURFACE WATER	C=CONTINUOUS FLIGHT AUGER	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAP/WIPE	DT=DRIVEN TUBE	SS=SPLIT SPOON
		W=SWAB/WIPE	BP=BLADDER PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth
SITE: Offbase TCE investigation

PROJECT: TCE Plume Investigation
PROJECT NO: AFC001-19 CCD

SAMPLE INFORMATION

SAMPLE ID: WHGLRW016-WG01

DATE: 8/26/99 TIME: 1445

MATRIX TYPE: WG

SAMPLING METHOD: BP

LOT CONTROL #: 0 1 1 1
(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: 1021

BEGINNING DEPTH: N/A

END DEPTH: N/A

GRAB (x) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB082697

TRIP BLANK (TB): TB082697

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	0	COLOR: clear	
2nd	0	ODOR: none	
		OTHER:	

pH 6.68 Temperature 28.06°C Dissolved Oxygen 4.57 mg/L Specific Conductivity 702 µmhos

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN — WIND DIRECTION SW AMBIENT TEMPERATURE 101°F

SHIPMENT VIA: FEDEX X HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: STL/Chicago

COMMENTS:

SAMPLER: Brad Nielsen OBSERVER: John Richard

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZRDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth
SITE: Off-base TCE investigation

PROJECT: TCE Plume Investigation
PROJECT NO: AFC001-19 CCD

SAMPLE INFORMATION

SAMPLE ID: WHGLRW017-WG01

DATE: 8/26/99 TIME: 1620

MATRIX TYPE: WG

SAMPLING METHOD: BP

LOT CONTROL #: 0 1 1 1
(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

BEGINNING DEPTH: N/A

END DEPTH: N/A

GRAB (x) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB082699

TRIP BLANK (TB): TB082691

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	0	COLOR:	
2nd	0	ODOR:	
		OTHER:	

pH _____ Temperature _____ Dissolved Oxygen _____ Specific Conductivity _____

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN — WIND DIRECTION SW AMBIENT TEMPERATURE 101°F

SHIPMENT VIA: FEDEX X HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: STL Chicago

COMMENTS:

SAMPLER: Brad Nielsen OBSERVER: John Dutford

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZRDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB, Texas

PROJECT: AFC001-~~26 HAA~~ 19 CCD

SITE: WHGL RW018

SAMPLE INFORMATION

SAMPLE ID: WHGLRW018WG01

DATE: 7-7-99 TIME: ~~Sec~~ PD 1215

MATRIX TYPE: WG

SAMPLING METHOD: Bladder pump

LOT CONTROL #: C 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

BEGINNING DEPTH: N/A

END DEPTH: N/A

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR BLANKS/QC SAMPLES ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): DUP01

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB010799

TRIP BLANK (TB): A

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 ml	3	HCl	8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS		MISCELLANEOUS
1st	1.2	COLOR:	cloudy	
2nd		ODOR:	none	
		OTHER:		

pH 7.34 Temperature 22.93°C Dissolved Oxygen 2.70 Specific Conductivity 571.0

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ____ WIND DIRECTION ____ AMBIENT TEMPERATURE 95°F

SHIPMENT VIA: FED-X X HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: STL - MD

COMMENTS: * w/ AFC001 26 HAA

SAMPLER: P. Devinuela OBSERVER: S. Duffard

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BR=BRASS RING	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	CS=COMPOSITE SAMPLE	H=HOLLOW STEM AUGER
SH=HAZRDOUS SOLID WASTE	WS=SURFACE WATER	C=CONTINUOUS FLIGHT AUGER	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAP/WIPE	DT=DRIVEN TUBE	SS=SPLIT SPOON
		W=SWAB/WIPE	BP=BLADDER PUMP

HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB, Texas

PROJECT: AFC001-~~26 HAA~~ 19 CCD

SITE: WHGL RW019

SAMPLE INFORMATION

SAMPLE ID: WHGL RW019WG01

DATE: 7-7-99 TIME: 930

MATRIX TYPE: WG

SAMPLING METHOD: Bladder pump

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

BEGINNING DEPTH: N/A

END DEPTH: N/A

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR BLANKS/QC SAMPLES ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB070799

TRIP BLANK (TB): *

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 ml	3	HCl	8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS		MISCELLANEOUS
1st	42.6	COLOR:	Clear	
2nd	0	ODOR:	none	
		OTHER:		

pH 7.25 Temperature 22.22°C Dissolved Oxygen 2.02 mg/L Specific Conductivity 596.0 µmhos/cm

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN _____ WIND DIRECTION _____ AMBIENT TEMPERATURE 95°F

SHIPMENT VIA: FED-X X HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: STL - MD

COMMENTS: * Reported w/ AFC 001 26 HAA

SAMPLER: P. Dermuth OBSERVER: J. Duffard

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BR=BRASS RING	HA=HAND AUGER
H=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	CS=COMPOSITE SAMPLE	H=HOLLOW STEM AUGER
SH=HAZRDOUS SOLID WASTE	WS=SURFACE WATER	C=CONTINUOUS FLIGHT AUGER	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAP/WIPE	DT=DRIVEN TUBE	SS=SPLIT SPOON
		W=SWAB/WIPE	BP=BLADDER PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB, Texas

PROJECT: AFC001-~~16 BBB~~ 19 CCD

SITE: TCE Plume

SAMPLE INFORMATION

SAMPLE ID: WHGLTA020WG01

DATE: 7-8-99 TIME: 1415

MATRIX TYPE: ~~SO~~WG

SAMPLING METHOD: DPT

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

BEGINNING DEPTH: —

END DEPTH: —

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR BLANKS/QC SAMPLES ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB070899

TRIP BLANK (TB): TB070899

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 ml	3	HCl	8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st 0	COLOR: Clear	
2nd	ODOR: none	
	OTHER:	

pH 7.24 Temp. 24.69°C Dissolved Oxygen 0.80 mg/L Conductivity 625 µmhos/cm

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN _____ WIND DIRECTION _____ AMBIENT TEMPERATURE 95°F

SHIPMENT VIA: FED-X X HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: Severn Trent Laboratories - Chicago

COMMENTS: _____

SAMPLER: P. Dacunalon OBSERVER: J. Dunbar

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BR=BRASS RING	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	CS=COMPOSITE SAMPLE	H=HOLLOW STEM AUGER
SH=HAZRDOUS SOLID WASTE	WS=SURFACE WATER	C=CONTINUOUS FLIGHT AUGER	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	DT=DRIVEN TUBE	SS=SPLIT SPOON
		W=SWAB/WIPE	BP=BLADDER PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB, Texas

PROJECT: AFC001-~~26 HAA~~ 19 CCD

SITE: (WHGLTA022) TCE Plume

SAMPLE INFORMATION

SAMPLE ID: WHGLTA022W001

DATE: 7-8-99 TIME: 955

MATRIX TYPE: WG

SAMPLING METHOD: Bladder pump

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #:

BEGINNING DEPTH: N/A

END DEPTH: N/A

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR BLANKS/QC SAMPLES ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): WHGLTA022W001 MS

MATRIX SPIKE DUP (SD): WHGLTA022W001 MD

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB070899

TRIP BLANK (TB): TB070899

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 ml	3	HCl	8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS		MISCELLANEOUS
1st	21.7	COLOR:	clear	
2nd	0	ODOR:	none	
		OTHER:		

pH 7.46 Temperature 21.78 °C Dissolved Oxygen 4.47 mg/l Specific Conductivity 517 µmhos/cm

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ____ WIND DIRECTION ____ AMBIENT TEMPERATURE 95°F

SHIPMENT VIA: FED-X X HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: STL - Chicago

COMMENTS:

SAMPLER: J.D. Offord OBSERVER: P. Daniels

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BR=BRASS RING	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	CS=COMPOSITE SAMPLE	H=HOLLOW STEM AUGER
SH=HAZRDOUS SOLID WASTE	WS=SURFACE WATER	C=CONTINUOUS FLIGHT AUGER	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAP/WIPE	DT=DRIVEN TUBE	SS=SPLIT SPOON
		W=SWAB/WIPE	BP=BLADDER PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB, Texas

PROJECT: AFC001-~~26 HAA~~ 19 CCD

SITE: WHGLTAO22

SAMPLE INFORMATION

SAMPLE ID: WHGLTAO22WG01MS

DATE: 7-8-99 TIME: 955

MATRIX TYPE: WG

SAMPLING METHOD: Bladder pump

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

BEGINNING DEPTH: ____ N/A

END DEPTH: ____ N/A

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR BLANKS/QC SAMPLES ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): WHGLTAO22MD

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB070899

TRIP BLANK (TB): TB070899

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 ml	3	HCl	8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS		MISCELLANEOUS
1st	21.7	COLOR:	Clear	
2nd	0	ODOR:	None	
		OTHER:		

pH 7.40 Temperature 21.78 °C Dissolved Oxygen 4.47 mg/L Specific Conductivity 517 uhms/cm

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ____ WIND DIRECTION ____ AMBIENT TEMPERATURE 95°F

SHIPMENT VIA: FED-X X HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: STL - Chicago

COMMENTS: _____

SAMPLER: P. Darnwarke OBSERVER: J. Duffard

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BR=BRASS RING	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	CS=COMPOSITE SAMPLE	H=HOLLOW STEM AUGER
SH=HAZRDOUS SOLID WASTE	WS=SURFACE WATER	C=CONTINUOUS FLIGHT AUGER	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAP/WIPE	DT=DRIVEN TUBE	SS=SPLIT SPOON
		W=SWAB/WIPE	BP=BLADDER PUMP

HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB, Texas

PROJECT: AFC001-~~26 HAA~~ 19 CCD

SITE: WHGLTA022

SAMPLE INFORMATION

SAMPLE ID: WHGLTA022MD WG01

DATE: 7-8-99 TIME: 955

MATRIX TYPE: WG

SAMPLING METHOD: Bladder pump

LOT CONTROL #: 1 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

BEGINNING DEPTH: N/A

END DEPTH: N/A

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR BLANKS/QC SAMPLES ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): WHGLTA022WG01MS

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB070899

TRIP BLANK (TB): TB070899

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40ml	3	HCl	8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS		MISCELLANEOUS
1st	21.7	COLOR:	clear	
2nd		ODOR:	none	
		OTHER:		

pH 7.40 Temperature 21.78°C Dissolved Oxygen 4.47 mg/L Specific Conductivity 517 umhos/cm

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ____ WIND DIRECTION ____ AMBIENT TEMPERATURE 95°F

SHIPMENT VIA: FED-X X HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: STL - Chicago

COMMENTS: _____

SAMPLER: P. Dennis OBSERVER: J. Duffard

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BR=BRASS RING	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	CS=COMPOSITE SAMPLE	H=HOLLOW STEM AUGER
SH=HAZRDOUS SOLID WASTE	WS=SURFACE WATER	C=CONTINUOUS FLIGHT AUGER	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAP/WIPE	DT=DRIVEN TUBE	SS=SPLIT SPOON
		W=SWAB/WIPE	BP=BLADDER PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB, Texas

PROJECT: AFC001-~~26 HAA~~ 19 CCD

SITE: WHGLTA023

SAMPLE INFORMATION

SAMPLE ID: WHGLTA023WG01

DATE: 7-7-99 TIME: 1452

MATRIX TYPE: WG

SAMPLING METHOD: Bladder pump

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

BEGINNING DEPTH: N/A

END DEPTH: N/A

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR BLANKS/QC SAMPLES ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): –

MATRIX SPIKE DUP (SD): –

FIELD DUP (FD): –

AMBIENT BLANK (AB): –

EQUIPMENT BLANK (EB): EB070799

TRIP BLANK (TB): *

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 ml	3	HCl	8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st 0	COLOR: cloudy	
2nd	ODOR: none	
	OTHER:	

pH 7.36 Temperature 23.19 Dissolved Oxygen 7.13 Specific Conductivity 541

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN _____ WIND DIRECTION _____ AMBIENT TEMPERATURE 95°

SHIPMENT VIA: FED-X X HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: STL – MO

COMMENTS: * w/ AFC 001 26 HAA

SAMPLER: R. Dasuwala OBSERVER: J. Duffard

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BR=BRASS RING	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	CS=COMPOSITE SAMPLE	H=HOLLOW STEM AUGER
SH=HAZRDOUS SOLID WASTE	WS=SURFACE WATER	C=CONTINUOUS FLIGHT AUGER	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAP/WIPE	DT=DRIVEN TUBE	SS=SPLIT SPOON
		W=SWAB/WIPE	BP=BLADDER PUMP

HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB, Texas

PROJECT: AFC001-~~26 HAA~~ 19 CCD

SITE: TCE Plume

SAMPLE INFORMATION

SAMPLE ID: WHGLTA025WGC1

DATE: 7-8-99 TIME: 1155

MATRIX TYPE: WG

SAMPLING METHOD: Bladder pump

LOT CONTROL #: C 1 1 1

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

BEGINNING DEPTH: N/A

END DEPTH: N/A

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR BLANKS/QC SAMPLES ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB070899

TRIP BLANK (TB): TB070899

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 ml	3	HCl	8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st 0	COLOR: clear	
2nd	ODOR: none	
	OTHER:	

pH 7.47 Temperature 27.51°C Dissolved Oxygen 2.64 mg/L Specific Conductivity 251 µmho/cm

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN _____ WIND DIRECTION _____ AMBIENT TEMPERATURE 95°F

SHIPMENT VIA: FED-X X HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: STL - Chicago

COMMENTS: _____

SAMPLER: P. Darowala OBSERVER: J. Duffard

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BR=BRASS RING	HA=HAND AUGER
H=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	CS=COMPOSITE SAMPLE	H=HOLLOW STEM AUGER
SH=HAZRDOUS SOLID WASTE	WS=SURFACE WATER	C=CONTINUOUS FLIGHT AUGER	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAP/WIPE	DT=DRIVEN TUBE	SS=SPLIT SPOON
		W=SWAB/WIPE	BP=BLADDER PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB, Texas

PROJECT: AFC001-~~26 HAA~~ 19 CCD

SITE: WHGLTABW18

SAMPLE INFORMATION

SAMPLE ID: DUP01

DATE: 7-7-99 TIME: 900

MATRIX TYPE: WG

SAMPLING METHOD: Bladder pump

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

BEGINNING DEPTH: N/A

END DEPTH: N/A

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR BLANKS/QC SAMPLES ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): _____

MATRIX SPIKE DUP (SD): _____

FIELD DUP (FD): WHGLBW18WG01

AMBIENT BLANK (AB): _____

EQUIPMENT BLANK (EB): EB070799

TRIP BLANK (TB): X

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40ml	3	HCl	8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st 0.0	COLOR: cloudy	
2nd	ODOR: none	
	OTHER:	

pH 7.34 Temperature 22.93 °C Dissolved Oxygen 2.70 mg/L Specific Conductivity 571.6 uS/cm

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN _____ WIND DIRECTION _____ AMBIENT TEMPERATURE 95°F

SHIPMENT VIA: FED-X X HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: STL - MD

COMMENTS: X TB070799 w/ AFC001 26 HAA

SAMPLER: D. Dunnele OBSERVER: J. DiPiero

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BR=BRASS RING	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	CS=COMPOSITE SAMPLE	H=HOLLOW STEM AUGER
SH=HAZRDOUS SOLID WASTE	WS=SURFACE WATER	C=CONTINUOUS FLIGHT AUGER	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAP/WIPE	DT=DRIVEN TUBE	SS=SPLIT SPOON
		W=SWAB/WIPE	BP=BLADDER PUMP

524 322

HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB, Texas

PROJECT: AFC001-~~26 HAA~~ 19 CCD

SITE: TCE Plume

SAMPLE INFORMATION

SAMPLE ID: TB070899

DATE: 7-8-99 TIME: 730

MATRIX TYPE: WG

SAMPLING METHOD: Bladder pump

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

BEGINNING DEPTH: N/A

END DEPTH: N/A

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR BLANKS/QC SAMPLES ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB070899

TRIP BLANK (TB): —

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 ml	2	HCl	8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st —	COLOR: —	
2nd —	ODOR: —	
	OTHER:	

pH — Temperature — Dissolved Oxygen — Specific Conductivity —

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ____ WIND DIRECTION ____ AMBIENT TEMPERATURE 98°F

SHIPMENT VIA: FED-X X HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: STL Chicago

COMMENTS: _____

SAMPLER: R Dominick OBSERVER: J. Duffard

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BR=BRASS RING	HA=HAND AUGER
=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	CS=COMPOSITE SAMPLE	H=HOLLOW STEM AUGER
SH=HAZRDOUS SOLID WASTE	WS=SURFACE WATER	C=CONTINUOUS FLIGHT AUGER	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAP/WIPE	DT=DRIVEN TUBE	SS=SPLIT SPOON
		W=SWAB/WIPE	BP=BLADDER PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB, Texas

PROJECT: AFC001-~~26 HAA~~ 19 CCD

SITE: TCE Plume

SAMPLE INFORMATION

SAMPLE ID: TB070999

DATE: 7-9-99 TIME: 736

MATRIX TYPE: WG

SAMPLING METHOD: Bladder pump

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

BEGINNING DEPTH: N/A

END DEPTH: N/A

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR BLANKS/QC SAMPLES ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB070999

TRIP BLANK (TB): —

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 ml	2	HCl	8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS		MISCELLANEOUS
1st	—	COLOR:	—	
2nd	—	ODOR:	—	
		OTHER:		

pH — Temperature — Dissolved Oxygen — Specific Conductivity —

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ____ WIND DIRECTION ____ AMBIENT TEMPERATURE 95°F

SHIPMENT VIA: FED-X X HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: STL - Chicago

COMMENTS:

SAMPLER: P. Darunvala OBSERVER: J. Duffield

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BR=BRASS RING	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	CS=COMPOSITE SAMPLE	H=HOLLOW STEM AUGER
SH=HAZRDOUS SOLID WASTE	WS=SURFACE WATER	C=CONTINUOUS FLIGHT AUGER	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAP/WIPE	DT=DRIVEN TUBE	SS=SPLIT SPOON
		W=SWAB/WIPE	BP=BLADDER PUMP

524-324

HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth
SITE: TCE Plume

PROJECT: TCE Plume Investigation
PROJECT NO: AFC001-19 CCD

SAMPLE INFORMATION

SAMPLE ID: TB071299
DATE: 7-12-99 TIME: 730

MATRIX TYPE: WG
SAMPLING METHOD: BP

LOT CONTROL #: C - - A
(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

BEGINNING DEPTH: N/A
END DEPTH: N/A
GRAB (x) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —
MATRIX SPIKE DUP (SD): —
FIELD DUP (FD): —
AMBIENT BLANK (AB): —
EQUIPMENT BLANK (EB): EB071299
TRIP BLANK (TB): —

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st —	COLOR: —	
2nd —	ODOR:	
	OTHER:	

pH — Temperature — Dissolved Oxygen — Specific Conductivity —

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN _____ WIND DIRECTION _____ AMBIENT TEMPERATURE 95°F

SHIPMENT VIA: FEDEX X HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: Severn Trent Laboratories--Chicago

COMMENTS:

SAMPLER: P. Darnell OBSERVER: S. Dalbert

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZRDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAP/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

524-325

HYDRO Geologic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB, Texas

PROJECT: AFC001-~~26 HAA~~ 19CCD

SITE: Off base

SAMPLE INFORMATION

SAMPLE ID: TB072899

DATE: 7/28/99 TIME: 1652

MATRIX TYPE: WG

SAMPLING METHOD: Bladder pump

LOT CONTROL #: 0 1 1 1

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #:

BEGINNING DEPTH: N/A

END DEPTH: N/A

GRAB NA COMPOSITE NA

ENTER SAMPLE NUMBERS FOR BLANKS/QC SAMPLES ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): —

TRIP BLANK (TB): —

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40ml VOA	3	HCl pH<2, cool to 4°C	8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	NA	COLOR: NA	
2nd	NA	ODOR: NA	
		OTHER:	

pH NA Temperature NA Dissolved Oxygen NA Specific Conductivity NA

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ____ WIND DIRECTION N AMBIENT TEMPERATURE 100°F

SHIPMENT VIA: FED-X X HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: STL

COMMENTS:

SAMPLER: Brad Welsey OBSERVER:

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BR=BRASS RING	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	CS=COMPOSITE SAMPLE	H=HOLLOW STEM AUGER
SH=HAZRDOUS SOLID WASTE	WS=SURFACE WATER	C=CONTINUOUS FLIGHT AUGER	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAP/WIPE	DT=DRIVEN TUBE	SS=SPLIT SPOON
		W=SWAB/WIPE	BP=BLADDER PUMP

5245326

HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth

PROJECT: 1999 Quarterly Groundwater Sampling

SITE: TCE Plume

PROJECT NO: AFC001-~~26 HAA~~ 19 CCD

SAMPLE INFORMATION

SAMPLE ID: EB070799

DATE: 7-7-99 TIME: 1615

MATRIX TYPE: WG

SAMPLING METHOD: BP

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

BEGINNING DEPTH: N/A

END DEPTH: N/A

GRAB (x) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): —

TRIP BLANK (TB): * w/AFC001 26 HAA

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st —	COLOR: —	
2nd —	ODOR: —	
	OTHER:	

pH — Temperature — Dissolved Oxygen — Specific Conductivity —

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN _____ WIND DIRECTION _____ AMBIENT TEMPERATURE _____

SHIPMENT VIA: FEDEX X HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: Severn Trent Laboratories--~~Chicago~~ MD

COMMENTS: _____

SAMPLER: R. Dorman OBSERVER: N. Hader

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZRDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAP/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

524 0327

HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth

SITE: TCE Plume

PROJECT: ~~1999 Quarterly Groundwater Sampling~~ PO

PROJECT NO: AFC001-~~26 HAA~~ 19 CCD

SAMPLE INFORMATION

SAMPLE ID: EB070899

DATE: 7-8-99 TIME: 3 30 pm

MATRIX TYPE: WG

SAMPLING METHOD: ~~BP~~ Grab

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

BEGINNING DEPTH: N/A

END DEPTH: N/A

GRAB (x) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): —

TRIP BLANK (TB): TB070899

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st —	COLOR: —	
2nd	ODOR: —	
	OTHER:	

pH — Temperature — Dissolved Oxygen — Specific Conductivity —

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN _____ WIND DIRECTION _____ AMBIENT TEMPERATURE 98

SHIPMENT VIA: FEDEX X HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: Severn Trent Laboratories--Chicago

COMMENTS: _____

SAMPLER: P. Dornuola OBSERVER: J. Duffard

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZRDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAP/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB, Texas

PROJECT: AFC001-~~26 HAA~~ 19 CLD

SITE: Off Base

SAMPLE INFORMATION

SAMPLE ID: EB072899

DATE: 7/28/99

TIME: ~~1608~~ 1646

MATRIX TYPE: WG

SAMPLING METHOD: Bladder pump

LOT CONTROL #: 0 1 1 1

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #:

BEGINNING DEPTH: N/A

END DEPTH: N/A

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR BLANKS/QC SAMPLES ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): —

TRIP BLANK (TB): —

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40ml VOA vial	3	HCl pH<2, cool to 4°C	8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	NA	COLOR: NA	
2nd	NA	ODOR: NA	
		OTHER:	

pH NA Temperature NA Dissolved Oxygen NA Specific Conductivity NA

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ____ WIND DIRECTION N AMBIENT TEMPERATURE 100°F

SHIPMENT VIA: FED-X X HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: STL

COMMENTS:

SAMPLER: Brad Nielsen OBSERVER:

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BR=BRASS RING	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	CS=COMPOSITE SAMPLE	H=HOLLOW STEM AUGER
SH=HAZRDOUS SOLID WASTE	WS=SURFACE WATER	C=CONTINUOUS FLIGHT AUGER	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAP/WIPE	DT=DRIVEN TUBE	SS=SPLIT SPOON
		W=SWAB/WIPE	BP=BLADDER PUMP

524 329

HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB PROJECT NAME: Groundwater Sampling

SITE: Off-base, TCE Delineation PROJECT NAME: AFC-001-19CCD

SAMPLE INFORMATION

SAMPLE ID WHGLRW015WG02 DATE: 9/14/99 TIME: 0905

MATRIX TYPE: WG

SAMPLING METHOD: Grab

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG. DEPTH (FT):

SAMPLE END DEPTH (FT):

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB091499

TRIP BLANK (TB): TB091499

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260A	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st 858 ppm	COLOR: Clear	
2nd	ODOR: None	
	OTHER:	

pH 6.71 Temperature 20.84 (C) Dissolved Oxygen 3.29 (mg/L) Specific Conductivity 763 (umhos/cm)

Iron _____ (mg/L) Oxidation/Reduction Potential 275 (mv) Turbidity 13.07 (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR ✓ OVERCAST/RAIN _____ WIND DIRECTION From the N AMBIENT TEMPERATURE 78°

SHIPMENT VIA: FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: STL - Chicago

COMMENTS: _____

SAMPLER: [signature] OBSERVER: C. Williams

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

524-3305

HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB

PROJECT NAME: Groundwater Sampling

SITE: Off-Base, TCE Delineation

PROJECT NAME: AFC-001-19CCD

SAMPLE INFORMATION

SAMPLE ID WHGLRW016-WG02

DATE: 9-16-99 TIME: 1040

MATRIX TYPE: WG

SAMPLING METHOD: Grab, Bladder Pump

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG. DEPTH (FT): 18.2'

SAMPLE END DEPTH (FT): —

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): Dup 01

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB091699

TRIP BLANK (TB): TB091699

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260A	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
2000+	COLOR: Clear	
2nd 35.6	ODOR: None	
	OTHER:	

pH 6.66 Temperature 23.94 (C) Dissolved Oxygen 3.46 (mg/L) Specific Conductivity 733 (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential 227 (mv) Turbidity 7.95 (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR _____ OVERCAST/RAIN ✓ WIND DIRECTION _____ AMBIENT TEMPERATURE 82°

SHIPMENT VIA: FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: STL - Chicago

COMMENTS: _____

SAMPLER: [signature] OBSERVER: C. Williams

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

524:331

HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB PROJECT NAME: Groundwater Sampling

SITE: Off Base, TCE Delineation PROJECT NAME: AFC-001-19CCD

SAMPLE INFORMATION

SAMPLE ID WHGLRW017 - WG02 DATE: 9-16-99 TIME: 1525

MATRIX TYPE: WG

SAMPLING METHOD: Grab, Bladder Pump

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG. DEPTH (FT): 20'

SAMPLE END DEPTH (FT): —

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB091699

TRIP BLANK (TB): TB091699

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260A	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	2000+	COLOR: Clear	
2nd	0.0	ODOR: None	
		OTHER:	

pH 6.60 Temperature 22.45 (C) Dissolved Oxygen 3.82 (mg/L) Specific Conductivity 746 (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential 195 (mv) Turbidity 17.6 (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR ✓ OVERCAST/RAIN _____ WIND DIRECTION _____ AMBIENT TEMPERATURE 85°

SHIPMENT VIA: FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: STL - Chicago

COMMENTS: _____

SAMPLER: [signature] OBSERVER: C. Willing

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB

PROJECT NAME: Groundwater Sampling

SITE: Off-Base, TCE Delineation

PROJECT NAME: AFC-001-19CCD

SAMPLE INFORMATION

SAMPLE ID WHGLRW018WG02

DATE: 9-15-99 TIME: 1610

MATRIX TYPE: WG

SAMPLING METHOD: Grab, Bladder Pump

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG. DEPTH (FT): 22.5'

SAMPLE END DEPTH (FT): —

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB091599

TRIP BLANK (TB): TB091599

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260A	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st 0.00 ppm	COLOR:	
2nd	ODOR:	
	OTHER:	

pH 6.71 Temperature 24.47 (C) Dissolved Oxygen 4.11 (mg/L) Specific Conductivity 709 (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential 198 (mv) Turbidity 7.45 (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR ✓ OVERCAST/RAIN _____ WIND DIRECTION From the NE AMBIENT TEMPERATURE 85°

SHIPMENT VIA: FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: STL - Chicago

COMMENTS: _____

SAMPLER: [signature] OBSERVER: C. Williams

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB
PROJECT NAME: Groundwater Sampling
SITE: Off-base, TCE Delineation
PROJECT NAME: AFC-001-19CCD

SAMPLE INFORMATION

SAMPLE ID WHGLRW019WG02
DATE: 9-14-99 TIME: 1420

MATRIX TYPE: WG

SAMPLING METHOD:

LOT CONTROL #: 0 1 1 A
(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #:

SAMPLE BEG. DEPTH (FT): 19.31
SAMPLE END DEPTH (FT): —
GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): WHGLRW019WG02 MS
MATRIX SPIKE DUP (SD): WHGLRW019WG02MD
FIELD DUP (FD): —
AMBIENT BLANK (AB): —
EQUIPMENT BLANK (EB): EB091499
TRIP BLANK (TB): TB091499

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260A	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS
1st 200+@ 528
2nd

SAMPLE CHARACTERISTICS
COLOR: None
ODOR: None
OTHER:

MISCELLANEOUS

pH 6.65 Temperature 23.22 (C) Dissolved Oxygen 4.35 (mg/L) Specific Conductivity 763 (umhos/cm)
Iron — (mg/L) Oxidation/Reduction Potential 199 (mv) Turbidity 3.50 (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR ✓ OVERCAST/RAIN ____ WIND DIRECTION From the NE AMBIENT TEMPERATURE 85°

SHIPMENT VIA: FEDEX x HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: STL - Chicago

COMMENTS:

SAMPLER: C. Willis via [illegible] OBSERVER: C. Willis

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

524 334

HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB PROJECT NAME: Groundwater Sampling

SITE: Off-Base, TCE Delineation PROJECT NAME: AFC-001-19CCD

SAMPLE INFORMATION

SAMPLE ID ~~WHGLTA020WG02MD~~ WHGLRW019WG02MD DATE: 9-14-99 TIME: 1420

MATRIX TYPE: WG

SAMPLING METHOD: Grab, Bladder Pump

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG. DEPTH (FT): 19.31

SAMPLE END DEPTH (FT): —

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): WHGLRW019-WG02MS

MATRIX SPIKE DUP (SD): ✓

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB091499

TRIP BLANK (TB): TB091499

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260A	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st 528 ppm	COLOR: Clear	
2nd	ODOR: None	
	OTHER:	

pH 6.65 Temperature 23.22 (C) Dissolved Oxygen 4.35 (mg/L) Specific Conductivity 763 (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential 199 (mv) Turbidity 3.50 (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR ✓ OVERCAST/RAIN _____ WIND DIRECTION From the NE AMBIENT TEMPERATURE 85°

SHIPMENT VIA: FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: STL - Chicago

COMMENTS: _____

SAMPLER: [signature] OBSERVER: C. Williams

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

524-335

HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB

SITE: Off Base - TCE Delineation

PROJECT NAME: Groundwater Sampling

PROJECT NAME: AFC-001-19CCD

SAMPLE INFORMATION

SAMPLE ID ~~WHGLTA020WG02MS~~ WHGLRW019-WG02MS

DATE: 9-14-99 TIME: 1420

MATRIX TYPE: WG

SAMPLING METHOD: Grab, Bladder Pump

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG. DEPTH (FT):

SAMPLE END DEPTH (FT):

GRAB ( ) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): ✓

MATRIX SPIKE DUP (SD): WHGLRW019-WG02MD

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB091499

TRIP BLANK (TB): TB091499

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260A	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st 5.28 ppm	COLOR: Clear	
2nd	ODOR: None	
	OTHER:	

pH 6.65 Temperature 23.22 (C) Dissolved Oxygen 4.35 (mg/L) Specific Conductivity 763 (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential 199 (mv) Turbidity 3.50 (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR ✓ OVERCAST/RAIN _____ WIND DIRECTION From the NE AMBIENT TEMPERATURE 85°

SHIPMENT VIA: FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: STL - Chicago

COMMENTS: _____

SAMPLER: [signature] OBSERVER: (J. William)

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB

PROJECT NAME: Groundwater Sampling

SITE: Off Base, TCE Delineation

PROJECT NAME: AFC-001-19CCD

SAMPLE INFORMATION

SAMPLE ID WHGLTA022WG02

DATE: 9-15-99 TIME: 1250

MATRIX TYPE: WG

SAMPLING METHOD: Grab, Bladder

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG. DEPTH (FT):

SAMPLE END DEPTH (FT):

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB091599

TRIP BLANK (TB): TB091599

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260A	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st 121 ppm	COLOR:	
2nd	ODOR:	
	OTHER:	

pH _____ Temperature _____(C) Dissolved Oxygen _____(mg/L) Specific Conductivity _____(umhos/cm)

Iron _____(mg/L) Oxidation/Reduction Potential _____(mv) Turbidity _____ (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR ✓ OVERCAST/RAIN _____ WIND DIRECTION _____ AMBIENT TEMPERATURE 85°

SHIPMENT VIA: FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: STL - Chicago

COMMENTS: _____

SAMPLER: [signature] OBSERVER: C. Willin

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB

PROJECT NAME: Groundwater Sampling

SITE: Off Base, TCE Delineation

PROJECT NAME: AFC-001-19CCD

SAMPLE INFORMATION

SAMPLE ID WHGLTA023WG02

DATE: 9-16-99 TIME: 1215

MATRIX TYPE: WG

SAMPLING METHOD: Grab, Bladder Pump

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG. DEPTH (FT): 22.6'

SAMPLE END DEPTH (FT): —

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB091699

TRIP BLANK (TB): TB091699

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260A	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	COLOR:	
2nd	ODOR:	
	OTHER:	

pH 6.71 Temperature 22.20 (C) Dissolved Oxygen 5.14 (mg/L) Specific Conductivity 669 (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential 222 (mv) Turbidity 27.1 (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR Mostly Cloudy ✓ OVERCAST/RAIN _____ WIND DIRECTION _____ AMBIENT TEMPERATURE 84°

SHIPMENT VIA: FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: STL - Chicago

COMMENTS: _____

SAMPLER: [signature] OBSERVER: C. Willis

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB

PROJECT NAME: Groundwater Sampling

SITE: Off-base, TCE Delineation

PROJECT NAME: AFC-001-19CCD

SAMPLE INFORMATION

SAMPLE ID WHGLTA025WG02

DATE: 9-14-99 TIME: 1650

MATRIX TYPE: WG

SAMPLING METHOD:

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG. DEPTH (FT):

SAMPLE END DEPTH (FT):

GRAB ( ) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB091499

TRIP BLANK (TB): TB091499

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260A	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st 2000+	COLOR:	
2nd	ODOR:	
	OTHER:	

pH _____ Temperature _____(C) Dissolved Oxygen _____(mg/L) Specific Conductivity _____(umhos/cm)

Iron _____(mg/L) Oxidation/Reduction Potential _____(mv) Turbidity_____ (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR ✓ OVERCAST/RAIN _____ WIND DIRECTION From the NE AMBIENT TEMPERATURE 85°

SHIPMENT VIA: FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: STL - Chicago

COMMENTS: _____

SAMPLER: [signature] OBSERVER: C. Willing

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB PROJECT NAME: Groundwater Sampling

SITE: Off Base, TCE Delineation PROJECT NAME: AFC-001-19CCD

SAMPLE INFORMATION

SAMPLE ID Dup 01 DATE: 9-16-99 TIME: 1200

MATRIX TYPE: WG

SAMPLING METHOD:

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #:

SAMPLE BEG. DEPTH (FT):

SAMPLE END DEPTH (FT):

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): ~~#~~ (C) ✓

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB091699

TRIP BLANK (TB): ~~TB06~~ (C) TB091699

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260A	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS

1st 2000+

2nd 35.6

SAMPLE CHARACTERISTICS

COLOR: Clear

ODOR: None

OTHER:

MISCELLANEOUS

pH 6.66 Temperature 23.94 (C) Dissolved Oxygen 3.46 (mg/L) Specific Conductivity 733 (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential 227 (mv) Turbidity 7.95 (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR ____ OVERCAST/RAIN ✓ WIND DIRECTION ____ AMBIENT TEMPERATURE 82°

SHIPMENT VIA: FEDEX x HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: STL - Chicago

COMMENTS:

SAMPLER: [signature] OBSERVER: C. Willis

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

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LOCATION: NAS Fort Worth JRB — PROJECT NAME: Groundwater Sampling

SITE: Off-Base, TCE Delineation — PROJECT NAME: AFC-001-19CCD

SAMPLE INFORMATION

SAMPLE ID EB091499 — DATE: 9-14-99 — TIME: 1530

MATRIX TYPE: WG

SAMPLING METHOD:

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG. DEPTH (FT): —

SAMPLE END DEPTH (FT): —

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): WHGLRW019-WG02MS

MATRIX SPIKE DUP (SD): WHGLRW019-WG02MS

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): ✓

TRIP BLANK (TB): TB091499

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260A	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS — SAMPLE CHARACTERISTICS — MISCELLANEOUS

2nd

COLOR: Clear

ODOR: None

OTHER:

pH _____ Temperature _____(C) Dissolved Oxygen _____(mg/L) Specific Conductivity _____(umhos/cm)

Iron _____(mg/L) Oxidation/Reduction Potential _____(mv) Turbidity _____ (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR ✓ OVERCAST/RAIN _____ WIND DIRECTION _____ AMBIENT TEMPERATURE _____

SHIPMENT VIA: FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: STL - Chicago

COMMENTS: _____

SAMPLER: [signature] OBSERVER: C. Williams

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB

PROJECT NAME: Groundwater Sampling

SITE: Off-Base, TCE Delineation

PROJECT NAME: AFC-001-~~19CCB~~ ~~05CD6~~ 19CCD

SAMPLE INFORMATION

SAMPLE ID ~~WHGLTA901WG03~~ EB091599

DATE: 9-15-99 TIME: 1700

MATRIX TYPE: WG

SAMPLING METHOD: Grab

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG. DEPTH (FT): N/A

SAMPLE END DEPTH (FT): N/A

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): ✓

TRIP BLANK (TB): TB091599

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
1 L Poly	1	Cool to 4C/HNO3 pH<2	SW6010A/SW7470A	Total Metals (App IX)
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260A	VOCs (App IX)
1 L Amber	2	Cool to 4C	SW8270B	SVOCs (App IX)

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	COLOR:	
2nd	ODOR:	
	OTHER:	

pH _____ Temperature _____(C) Dissolved Oxygen _____(mg/L) Specific Conductivity _____(umhos/cm)

Iron _____(mg/L) Oxidation/Reduction Potential _____(mv) Turbidity _____ (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR _____ OVERCAST/RAIN _____ WIND DIRECTION _____ AMBIENT TEMPERATURE _____

SHIPMENT VIA: FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: STL - Chicago

COMMENTS: _____

SAMPLER: C. Williams OBSERVER: [signature]

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

524 342 ESS

HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB PROJECT NAME: Groundwater Sampling

SITE: Off Base, TCE Delineation PROJECT NAME: AFC-001-19CCD

SAMPLE INFORMATION

SAMPLE ID EB091699 DATE: 9-16-99 TIME: 1630

MATRIX TYPE: WG

SAMPLING METHOD:

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG. DEPTH (FT): —

SAMPLE END DEPTH (FT): —

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): Dup01

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): ✓

TRIP BLANK (TB): TB091699

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260A	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	—	COLOR: Clear	
2nd	—	ODOR: None	
		OTHER:	

pH — Temperature — (C) Dissolved Oxygen — (mg/L) Specific Conductivity — (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential — (mv) Turbidity — (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR _____ OVERCAST/RAIN _____ WIND DIRECTION _____ AMBIENT TEMPERATURE _____

SHIPMENT VIA: FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: STL - Chicago

COMMENTS: _____

SAMPLER: C. Willion OBSERVER: [signature]

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB PROJECT NAME: Groundwater Sampling

SITE: OPP-Base, TCE Delineation PROJECT NAME: AFC-001-19CCD

SAMPLE INFORMATION

SAMPLE ID TB091499 DATE: 9-14-99 TIME: 0730

MATRIX TYPE: WG

SAMPLING METHOD:

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG. DEPTH (FT): —

SAMPLE END DEPTH (FT): —

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): WHGLRW019-WG02MS

MATRIX SPIKE DUP (SD): WHGLRW019-WG02MD

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB091499

TRIP BLANK (TB): ✓

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260A	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	COLOR:	
2nd	ODOR:	
	OTHER:	

pH _____ Temperature _____(C) Dissolved Oxygen _____(mg/L) Specific Conductivity _____(umhos/cm)

Iron _____(mg/L) Oxidation/Reduction Potential _____(mv) Turbidity _____ (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR _____ OVERCAST/RAIN _____ WIND DIRECTION _____ AMBIENT TEMPERATURE _____

SHIPMENT VIA: FEDEX __x__ HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: STL-Chicago

COMMENTS: _____

SAMPLER: [signature] OBSERVER: C. Williams

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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FIELD SAMPLING REPORT

HYDRO GeoLogic INC.

ATION:	NAS Fort Worth JRB	PROJECT NAME:	Groundwater Sampling
SITE:	Off-Base, TCE Delineation	PROJECT NAME:	AFC-001-19CCD

SAMPLE INFORMATION

SAMPLE ID TB091599 DATE: 9-15-99 TIME: 0750

MATRIX TYPE: WG

SAMPLING METHOD:

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG. DEPTH (FT): N/A

SAMPLE END DEPTH (FT): N/A

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB091599

TRIP BLANK (TB): ✓

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260A	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	COLOR:	
2nd	ODOR:	
	OTHER:	

pH _____ Temperature _____(C) Dissolved Oxygen _____(mg/L) Specific Conductivity _____(umhos/cm)

Iron _____(mg/L) Oxidation/Reduction Potential _____(mv) Turbidity_____ (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR _____ OVERCAST/RAIN _____ WIND DIRECTION _____ AMBIENT TEMPERATURE _____

SHIPMENT VIA: FEDEX __x__ HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: STL - Chicago

COMMENTS: _____

SAMPLER: [signature] OBSERVER: C. Williams

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB PROJECT NAME: Groundwater Sampling

SITE: Off Base, TCE Delineation PROJECT NAME: AFC-001-19CCD

SAMPLE INFORMATION

SAMPLE ID TB091699 DATE: 9-16-99 TIME: 0800

MATRIX TYPE: WG

SAMPLING METHOD:

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG. DEPTH (FT): —

SAMPLE END DEPTH (FT): —

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): Dup 01

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB091699

TRIP BLANK (TB): ✓

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260A	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	—	COLOR: Clear	
2nd	—	ODOR: None	
		OTHER:	

pH — Temperature — (C) Dissolved Oxygen — (mg/L) Specific Conductivity — (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential — (mv) Turbidity — (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR _____ OVERCAST/RAIN _____ WIND DIRECTION _____ AMBIENT TEMPERATURE _____

SHIPMENT VIA: FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: STL - Chicago

COMMENTS:

SAMPLER: C. Willing OBSERVER: [illegible]

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

524.346

HYDRO Geologic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB

PROJECT NAME: ~~DO 19 Off Base~~ Plume Delineation

SITE: Plume Delineation

PROJECT NAME: AFC 001 19 CCD

SAMPLE INFORMATION

SAMPLE ID WHGLRW015WG03

DATE: 11-4-99 TIME: 1825

MATRIX TYPE: WG

SAMPLING METHOD: BP

LOT CONTROL #: O I I A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: 190603

SAMPLE BEG. DEPTH (FT): N/A

SAMPLE END DEPTH (FT): N/A

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): Dup01WG03

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB110499

TRIP BLANK (TB): TB110499

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	~~2~~ 3	Cool to 4C/HCl to pH<2	SW8260~~A~~B	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st 0.0ppm	COLOR: Clear	
2nd 0.0ppm	ODOR: None	
	OTHER: —	

pH 6.73 Temperature 21.02 (C) Dissolved Oxygen 3.60 (mg/L) ~~Specific~~ Conductivity 917 (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential 240 (mv) Turbidity 20.5 (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR ✓ OVERCAST/RAIN ____ WIND DIRECTION — AMBIENT TEMPERATURE 68°

SHIPMENT VIA: FEDEX x HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: STL - Chicago

COMMENTS:

SAMPLER: J. Wallace OBSERVER: C. Williams

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB

SITE: Plume Delineation

PROJECT NAME: ~~DO 19 Off Base~~ Plume Delineation

PROJECT NAME: AFC 001 19 CCD

SAMPLE INFORMATION

SAMPLE ID WHGLRW016WG03

DATE: 11/3/99 TIME: 1024

MATRIX TYPE: WG

SAMPLING METHOD: GRAB

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: 190602

SAMPLE BEG. DEPTH (FT): NA

SAMPLE END DEPTH (FT): NA

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB110399

TRIP BLANK (TB): TB110399

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260A	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	0.0 ppm	COLOR: clear	
2nd	0.0 ppm	ODOR: none	
		OTHER:	

pH 6.57 Temperature 22.43 (C) Dissolved Oxygen 2.97 (mg/L) ~~Specific~~ Conductivity 616.0 (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential 246.6 (mv) Turbidity 9.16 (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ____ WIND DIRECTION N AMBIENT TEMPERATURE 60°

SHIPMENT VIA: FEDEX x HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: STL - Chicago

COMMENTS:

SAMPLER: C. Williams OBSERVER: J. Wallace

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB
SITE: Plume Delineation

PROJECT NAME: ~~DO 19~~ (a) Plume Delineation
PROJECT NAME: AFC 001 19 CCD

SAMPLE INFORMATION

SAMPLE ID WHGLRW017WG03

DATE: 11/3/99 TIME: 1255

MATRIX TYPE: WG

SAMPLING METHOD: GRAB

LOT CONTROL #: ~~12~~ 1 1 A
(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: 190002

SAMPLE BEG. DEPTH (FT): NA
SAMPLE END DEPTH (FT): NA
GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —
MATRIX SPIKE DUP (SD): —
FIELD DUP (FD): —
AMBIENT BLANK (AB): —
EQUIPMENT BLANK (EB): EB110399
TRIP BLANK (TB): TB110399

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260A	VOCs ~~(App IX)~~ (a)

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	0.8 ppm	COLOR: murky	
2nd	0.0 ppm	ODOR: none	
		OTHER: NA	

pH 6.61 Temperature 20.86 (C) Dissolved Oxygen 4.67 (mg/L) ~~Specific~~ (a) Conductivity 621 (umhos/cm)
Iron — (mg/L) Oxidation/Reduction Potential 238.5 (mv) Turbidity 29.9 (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ____ WIND DIRECTION N AMBIENT TEMPERATURE 60°

SHIPMENT VIA: FEDEX x HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: STL - Chicago

COMMENTS:

SAMPLER: C. Williams OBSERVER: J. Wallace

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB

SITE: Plume Delineation

PROJECT NAME: ~~DO 19~~ Plume Delineation

PROJECT NAME: AFC 001 19 CCD

SAMPLE INFORMATION

SAMPLE ID ~~TB110599~~ WHGLRW018WG03

DATE: 11/1/99 TIME: 1605

MATRIX TYPE: WG

SAMPLING METHOD:

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: 190001

SAMPLE BEG. DEPTH (FT): NA

SAMPLE END DEPTH (FT): NA

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB110199

TRIP BLANK (TB): TB110199

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	32	Cool to 4C/HCl to pH < 2	SW8260~~A~~ B	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS

1st 0.0 ppm at Wellhead

2nd 0.0 ppm in BZ

SAMPLE CHARACTERISTICS

COLOR: Clear

ODOR: none

OTHER: NA

MISCELLANEOUS

pH 6.72 Temperature 21.22 (C) Dissolved Oxygen 13.03 (mg/L) ~~Specific~~ Conductivity 930.0 (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential 280.2 (mv) Turbidity 8.92 (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN — WIND DIRECTION — AMBIENT TEMPERATURE 60°

SHIPMENT VIA: FEDEX x HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: STL - Chicago

COMMENTS:

SAMPLER: C. Williams OBSERVER: J. Wallace

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB
SITE: Plume Delineation

PROJECT NAME: ~~BO 19~~ Plume Delineation
PROJECT NAME: AFC 001 19 CCD

SAMPLE INFORMATION

SAMPLE ID WHGLRW019WG03

DATE: 11-4-99 TIME: 950

MATRIX TYPE: WG

SAMPLING METHOD: BP

LOT CONTROL #: O L L A
(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: 190003

SAMPLE BEG. DEPTH (FT): NA
SAMPLE END DEPTH (FT): NA
GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): WHGLRW019WG03MS
MATRIX SPIKE DUP (SD): WHGLRW019WG03MD
FIELD DUP (FD): —
AMBIENT BLANK (AB): —
EQUIPMENT BLANK (EB): EB110499
TRIP BLANK (TB): TB110499

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260A	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st 0.0 ppm	COLOR: Clear	
2nd 0.0 ppm	ODOR: None	
	OTHER: —	

pH 6.68 Temperature 21.72 (C) Dissolved Oxygen 4.15 (mg/L) ~~Specific~~ Conductivity 893 (umhos/cm)
Iron — (mg/L) Oxidation/Reduction Potential 292 (mv) Turbidity 6.65 (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR ✓ OVERCAST/RAIN ____ WIND DIRECTION ____ AMBIENT TEMPERATURE 60°

SHIPMENT VIA: FEDEX x HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: STL - Chicago

COMMENTS:

SAMPLER: J. Wallace OBSERVER: C. Williams

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB

SITE: Plume Delineation

PROJECT NAME: ~~DO 19~~ Plume Delineation

PROJECT NAME: AFC 001 19 CCD

SAMPLE INFORMATION

SAMPLE ID ~~DUP01WG03~~ WHGLRW019 ~~MS~~ WG03MS DATE: 11-4-99 TIME: 950

MATRIX TYPE: WG

SAMPLING METHOD: BP

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: 190003

SAMPLE BEG. DEPTH (FT): NA

SAMPLE END DEPTH (FT): NA

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): WHGLRW019 ~~MSD~~ WG03MD

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB110499

TRIP BLANK (TB): TB110499

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260~~A~~B	VOCs (~~App IX~~)

NOTABLE OBSERVATIONS

PID READINGS

1st 0.0 ppm

2nd 0.0 ppm

SAMPLE CHARACTERISTICS

COLOR: Clear

ODOR: None

OTHER: —

MISCELLANEOUS

pH 6.68 Temperature 21.72 (C) Dissolved Oxygen 4.15 (mg/L) ~~Specific~~ Conductivity 893 (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential 292 (mv) Turbidity 6.65 (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR ✓ OVERCAST/RAIN ____ WIND DIRECTION ____ AMBIENT TEMPERATURE 60°

SHIPMENT VIA: FEDEX x HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: STL - Chicago

COMMENTS:

SAMPLER: J. Wallace OBSERVER: C. Williams

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB

SITE: Plume Delineation

PROJECT NAME: ~~DO 19~~ Plume Delineation

PROJECT NAME: AFC 001 19 CCD

SAMPLE INFORMATION

SAMPLE ID ~~DUP01WG03~~ WHGLRW019 ~~AAD~~ WG03MD

DATE: 11-4-99 TIME: 950

MATRIX TYPE: WG

SAMPLING METHOD: BP

LOT CONTROL #: O I L A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: 190003

SAMPLE BEG. DEPTH (FT): NA

SAMPLE END DEPTH (FT): NA

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): WHGLRW019 ~~AAS~~ WG03MS

MATRIX SPIKE DUP (SD): _____

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB110499

TRIP BLANK (TB): TB110499

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260~~A~~ B	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st 0.0 ppm	COLOR: Clear	
2nd 0.0 ppm	ODOR: None	
	OTHER: —	

pH 6.68 Temperature 21.72 (C) Dissolved Oxygen 4.15 (mg/L) ~~Specific~~ Conductivity 893 (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential 292 (mv) Turbidity 6.65 (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR ✓ OVERCAST/RAIN _____ WIND DIRECTION _____ AMBIENT TEMPERATURE 60°

SHIPMENT VIA: FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: STL - Chicago

COMMENTS: _____

SAMPLER: J. Wallace OBSERVER: C. Williams

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB

SITE: Plume Delineation

PROJECT NAME: ~~DO 19~~ Plume Delineation

PROJECT NAME: AFC 001 19 CCD

SAMPLE INFORMATION

SAMPLE ID WHGLTA020WG03

DATE: ~~11-5-99~~ 11-5-99 TIME: 1055

MATRIX TYPE: WG

SAMPLING METHOD: BP

LOT CONTROL #: 011A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #) 130004

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG. DEPTH (FT): NA

SAMPLE END DEPTH (FT): NA

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB110499

TRIP BLANK (TB): TB110499

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260~~A~~ B	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS		MISCELLANEOUS
1st	0.0ppm	COLOR:	Clear	
2nd	0.0ppm	ODOR:	None	
		OTHER:		

* pH — Temperature — (C) Dissolved Oxygen — (mg/L) Specific Conductivity — (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential — (mv) Turbidity — (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR ✓ OVERCAST/RAIN ____ WIND DIRECTION SE AMBIENT TEMPERATURE 73°

SHIPMENT VIA: FEDEX x HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: STL - Chicago

COMMENTS: * Well purged dry on 11/4/99, sampled with pump after overnight recovery.

SAMPLER: J. Wallace OBSERVER: C. Williams

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB

SITE: Plume Delineation

PROJECT NAME: ~~DO 19~~ Plume Delineation

PROJECT NAME: AFC 001 19 CCD

SAMPLE INFORMATION

SAMPLE ID WHGLTA022WG03

DATE: 11/3/99 TIME: 1753

MATRIX TYPE: WG

SAMPLING METHOD: GRAB

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: 190002

SAMPLE BEG. DEPTH (FT): NA

SAMPLE END DEPTH (FT): NA

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB110399

TRIP BLANK (TB): TB110399

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260A	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st 2.4 ppm	COLOR: Murky	
2nd 0.0 ppm all BZ	ODOR: None	
	OTHER: —	

pH 6.75 Temperature 20.29 (C) Dissolved Oxygen 6.23 (mg/L) ~~Specific~~ Conductivity 573 (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential 265.0 (mv) Turbidity 60.40 (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN — WIND DIRECTION from S AMBIENT TEMPERATURE 60°

SHIPMENT VIA: FEDEX x HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: STL - Chicago

COMMENTS:

SAMPLER: C. Williams OBSERVER: J. Wallace

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB

SITE: Plume Delineation

PROJECT NAME: ~~DO 19~~ Plume Delineation

PROJECT NAME: AFC 001 19 CCD

SAMPLE INFORMATION

SAMPLE ID WHGLTA023WG03

DATE: 11/2/99 TIME: 1430

MATRIX TYPE: WG

SAMPLING METHOD: GRAB

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: 190001

SAMPLE BEG. DEPTH (FT): — NA

SAMPLE END DEPTH (FT): — NA

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB110299

TRIP BLANK (TB): TB110299

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260~~A~~ B	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st 6.0 ppm	COLOR: murky	
2nd 6.0 ppm	ODOR: none	
	OTHER: N/A	

pH 6.79 Temperature 20.07 (C) Dissolved Oxygen 5.11 (mg/L) ~~Specific~~ Conductivity 884 (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential 242.3 (mv) Turbidity 180.4 (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ____ WIND DIRECTION West AMBIENT TEMPERATURE 55°

SHIPMENT VIA: FEDEX x HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: STL - Chicago

COMMENTS:

SAMPLER: Catherine Williams OBSERVER: Jennifer Wallace

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB

SITE: Plume Delineation

PROJECT NAME: ~~DO 19~~ Plume Delineation

PROJECT NAME: AFC 001 19 CCD

SAMPLE INFORMATION

SAMPLE ID ~~DUP01WG03~~ WHGLTA023WG03 DATE: 11-4-99 TIME: 1305

MATRIX TYPE: WG

SAMPLING METHOD: BP

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: 196603

SAMPLE BEG. DEPTH (FT): NA

SAMPLE END DEPTH (FT): NA

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB110499

TRIP BLANK (TB): TB110499

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260~~A~~ B	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st 0.0 ppm	COLOR: Clear	
2nd 0.0 ppm	ODOR: None	
	OTHER: —	

pH 6.73 Temperature 20.80 (C) Dissolved Oxygen 5.37 (mg/L) ~~Specific~~ Conductivity 778 (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential 247 (mv) Turbidity 7.87 (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR ✓ OVERCAST/RAIN ____ WIND DIRECTION From the SE AMBIENT TEMPERATURE 65°

SHIPMENT VIA: FEDEX x HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: STL - Chicago

COMMENTS:

SAMPLER: J. Wallace OBSERVER: C. Williams

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB

SITE: Plume Delineation

PROJECT NAME: ~~DO 19~~ Plume Delineation

PROJECT NAME: AFC 001 19 CCD

SAMPLE INFORMATION

SAMPLE ID WHGLTA025WG03

DATE: 11-5-99 TIME: 940

MATRIX TYPE: WG

SAMPLING METHOD: BP

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: 190004

SAMPLE BEG. DEPTH (FT): NA

SAMPLE END DEPTH (FT): NA

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB110599

TRIP BLANK (TB): TB110599

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260~~A~~B	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st 0.0 ppm	COLOR: Clear	
2nd 0.0 ppm	ODOR: None	
	OTHER: —	

pH 6.85 Temperature 21.36 (C) Dissolved Oxygen 4.39 (mg/L) ~~Specific~~ Conductivity 385 (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential 232 (mv) Turbidity 8.73 (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR ✓ OVERCAST/RAIN ____ WIND DIRECTION — AMBIENT TEMPERATURE 68°

SHIPMENT VIA: FEDEX x HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: STL - Chicago

COMMENTS:

SAMPLER: J. Wallace OBSERVER: C. Williams

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB
SITE: Plume Delineation

PROJECT NAME: ~~DO 19~~ Plume Delineation
PROJECT NAME: AFC 001 19 CCD

SAMPLE INFORMATION

SAMPLE ID DUP01WG03
DATE: 11-4-99 TIME: 1200 *

MATRIX TYPE: WG
SAMPLING METHOD: BP
LOT CONTROL #: 0 1 1 A
(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)
CHAIN-OF-CUSTODY #: 190603

SAMPLE BEG. DEPTH (FT): N/A
SAMPLE END DEPTH (FT): N/A
GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:
MATRIX SPIKE (MS): —
MATRIX SPIKE DUP (SD): —
FIELD DUP (FD): *
AMBIENT BLANK (AB): —
EQUIPMENT BLANK (EB): EB110499
TRIP BLANK (TB): TB110499

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260~~A~~ B	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st 0.0ppm	COLOR: Clear	
2nd 0.0ppm	ODOR: None	
	OTHER: —	

pH 6.73 Temperature 21.02 (C) Dissolved Oxygen 3.60 (mg/L) ~~Specific~~ Conductivity 917 (umhos/cm)
Iron — (mg/L) Oxidation/Reduction Potential 240 (mv) Turbidity 20.5 (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR ✓ OVERCAST/RAIN ____ WIND DIRECTION — AMBIENT TEMPERATURE 68°
SHIPMENT VIA: FEDEX x HAND DELIVER ____ COURIER ____ OTHER ____
SHIPPED TO: STL - Chicago
COMMENTS: * Associated with sample WHGLRW015WG03 at time 1825.
SAMPLER: J. Wallace OBSERVER: C. Williams

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

524 359

HYDRO GeoLogic Inc.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB

SITE: Plume Delineation

PROJECT NAME: ~~DO 19 Air Base~~ Plume Delineation

PROJECT NAME: AFC 001 19 CCD

SAMPLE INFORMATION

SAMPLE ID ~~EB110399~~ AB110399

DATE: 11/3/99 TIME: 1310

MATRIX TYPE: WG

SAMPLING METHOD: GRAB

LOT CONTROL #: 1 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: 190002

SAMPLE BEG. DEPTH (FT): NA

SAMPLE END DEPTH (FT): NA

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): AB110399

EQUIPMENT BLANK (EB): EB110399

TRIP BLANK (TB): TB110399

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260A	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS		MISCELLANEOUS
1st	—	COLOR:	Clear	
2nd	—	ODOR:	none	
		OTHER:	NA	

pH — Temperature — (C) Dissolved Oxygen — (mg/L) Specific Conductivity — (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential — (mv) Turbidity — (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ____ WIND DIRECTION N AMBIENT TEMPERATURE 60°

SHIPMENT VIA: FEDEX x HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: STL - Chicago

COMMENTS:

SAMPLER: C. Williams OBSERVER: J. Wallace

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB

SITE: Plume Delineation

PROJECT NAME: ~~00 19 Off Base~~ Plume Delineation

PROJECT NAME: AFC 001 19 CCD

SAMPLE INFORMATION

SAMPLE ID EB110199

DATE: 11/1/99 TIME: 1745

MATRIX TYPE: WG

SAMPLING METHOD: GRAB

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: 190001

SAMPLE BEG. DEPTH (FT): NA

SAMPLE END DEPTH (FT): NA

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB110199

TRIP BLANK (TB): TB110199

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260~~A~~ B	VOCs (App IX)

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS		MISCELLANEOUS
1st	—	COLOR:	Clear	
2nd	—	ODOR:	None	
		OTHER:	NA	

pH — Temperature — (C) Dissolved Oxygen — (mg/L) Specific Conductivity — (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential — (mv) Turbidity — (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN — WIND DIRECTION — AMBIENT TEMPERATURE 60°

SHIPMENT VIA: FEDEX x HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: STL - Chicago

COMMENTS:

SAMPLER: C. Williams OBSERVER: J. Wallace

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

524 361

HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB

PROJECT NAME: ~~DO 19~~ @ Plume Delineation

SITE: Plume Delineation

PROJECT NAME: AFC 001 19 CCD

SAMPLE INFORMATION

SAMPLE ID EB110499

DATE: 11-4-99 TIME: 1715

MATRIX TYPE: WG

SAMPLING METHOD: ~~BP~~ @ G

LOT CONTROL #: 0 L 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: 196603

SAMPLE BEG. DEPTH (FT): NA

SAMPLE END DEPTH (FT): NA

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): WHGLRW019WG03MS

MATRIX SPIKE DUP (SD): WHGLRW019WG03MD

FIELD DUP (FD): Dup01WG03

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): —

TRIP BLANK (TB): TB110499

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260A B	VOCs ~~(App IX)~~ @

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	~~0.0 ppm~~ @ —	COLOR: Clear	
2nd	—	ODOR: None	
		OTHER: —	

pH — Temperature — (C) Dissolved Oxygen — (mg/L) Specific Conductivity — (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential — (mv) Turbidity — (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR — OVERCAST/RAIN — WIND DIRECTION — AMBIENT TEMPERATURE —

SHIPMENT VIA: FEDEX x HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: STL - Chicago

COMMENTS:

SAMPLER: J. Wallace OBSERVER: C. Williams

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB

SITE: Plume Delineation

PROJECT NAME: ~~DO 19~~ Plume Delineation

PROJECT NAME: AFC 001 19 CCD

SAMPLE INFORMATION

SAMPLE ID EB110599

DATE: 11-5-99 TIME: 1030

MATRIX TYPE: WG

SAMPLING METHOD: Grab

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: 190004

SAMPLE BEG. DEPTH (FT):

SAMPLE END DEPTH (FT):

GRAB ( ) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): —

TRIP BLANK (TB): TB110599

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260~~A~~ B	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	—	COLOR: Clear	
2nd	—	ODOR: None	
		OTHER: —	

pH — Temperature — (C) Dissolved Oxygen — (mg/L) Specific Conductivity — (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential — (mv) Turbidity — (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR ✓ OVERCAST/RAIN ___ WIND DIRECTION — AMBIENT TEMPERATURE 68°

SHIPMENT VIA: FEDEX x HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: STL - Chicago

COMMENTS:

SAMPLER: C. Williams OBSERVER: J. Wallace

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB

SITE: —

PROJECT NAME: ~~DO 19~~ Plume Delineation

PROJECT NAME: AFC 001 19 CCD

SAMPLE INFORMATION

SAMPLE ID TB110199

DATE: 11/1/99 TIME: 1400

MATRIX TYPE: WG

SAMPLING METHOD: GRAB

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: 190001

SAMPLE BEG. DEPTH (FT): NA

SAMPLE END DEPTH (FT): NA

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB110199

TRIP BLANK (TB): TB110199

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	~~3~~ 2	Cool to 4C/HCl to pH < 2	SW8260~~A~~B	VOCs (App IX)

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st —	COLOR: clear	
2nd —	ODOR: none	
	OTHER: —	

pH — Temperature — (C) Dissolved Oxygen — (mg/L) Specific Conductivity — (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential — (mv) Turbidity — (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN — WIND DIRECTION — AMBIENT TEMPERATURE 60°

SHIPMENT VIA: FEDEX x HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: STL - Chicago

COMMENTS:

SAMPLER: C. Williams / ~~J. Wallace~~ (JW) OBSERVER: J. Wallace

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB

SITE: Plume Delineation

PROJECT NAME: ~~DO 19~~ Plume Delineation

PROJECT NAME: AFC 001 19 CCD

SAMPLE INFORMATION

SAMPLE ID TB110299

DATE: 11-2-99 TIME: 815

MATRIX TYPE: WG

SAMPLING METHOD: Grab

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: 190001

SAMPLE BEG. DEPTH (FT): N/A

SAMPLE END DEPTH (FT): N/A

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): _____

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB110299

TRIP BLANK (TB): _____

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	~~3~~ 2	Cool to 4C/HCl to pH<2	SW8260A ~~B~~	VOCs (~~App IX~~)

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	—	COLOR: Clear	
2nd	—	ODOR: None	
		OTHER: —	

pH — Temperature — (C) Dissolved Oxygen — (mg/L) Specific Conductivity — (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential — (mv) Turbidity — (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR — OVERCAST/RAIN — WIND DIRECTION — AMBIENT TEMPERATURE —

SHIPMENT VIA: FEDEX x HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: STL - Chicago

COMMENTS: _____

SAMPLER: C. Williams OBSERVER: J. Wallace

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB

SITE: Plume Delineation

PROJECT NAME: ~~DO 19~~ Plume Delineation

PROJECT NAME: AFC 001 19 CCD

SAMPLE INFORMATION

SAMPLE ID TB110499

DATE: 11-4-99 TIME: 745

MATRIX TYPE: WG

SAMPLING METHOD: G

LOT CONTROL #: O L L A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: 190003

SAMPLE BEG. DEPTH (FT): NA

SAMPLE END DEPTH (FT): NA

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): WHGLRW019WG03MS

MATRIX SPIKE DUP (SD): WHGLRW019WG03MD

FIELD DUP (FD): Dup01WG03

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): EB110499

TRIP BLANK (TB): TB110499

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	2	Cool to 4C/HCl to pH<2	SW8260~~A~~ B	VOCs ~~(App IX)~~

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	—	COLOR: Clear	
2nd	—	ODOR: None	
		OTHER: —	

pH — Temperature — (C) Dissolved Oxygen — (mg/L) Specific Conductivity — (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential — (mv) Turbidity — (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR — OVERCAST/RAIN — WIND DIRECTION — AMBIENT TEMPERATURE —

SHIPMENT VIA: FEDEX x HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: STL-Chicago

COMMENTS:

SAMPLER: C. Williams OBSERVER: J. Wallace

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB
SITE: Plume Delineation

PROJECT NAME: ~~DO49 Off Base~~ Plume Delineation
PROJECT NAME: AFC 001 19 CCD

SAMPLE INFORMATION

SAMPLE ID ~~EB110299~~ TB110599
DATE: 11-5-99 TIME: 715

MATRIX TYPE: WG
SAMPLING METHOD: BP
LOT CONTROL #: 0 1 1 A
(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)
CHAIN-OF-CUSTODY #: 190604

SAMPLE BEG. DEPTH (FT): N/A
SAMPLE END DEPTH (FT): N/A
GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —
MATRIX SPIKE DUP (SD): —
FIELD DUP (FD): —
AMBIENT BLANK (AB): —
EQUIPMENT BLANK (EB): EB110599
TRIP BLANK (TB):

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
~~1 L Poly~~	~~1~~	~~Cool to 4C/HNO3 pH<2~~	~~SW6010A/SW7470A~~	~~Total Metals (App IX)~~ + Mercury
40 mL VOA	~~3~~ 2	Cool to 4C/HCl to pH<2	SW8260~~A~~B	VOCs (~~App IX~~)
~~1 L Amber~~	~~2~~	~~Cool to 4C~~	~~SW8270B~~	~~SVOCs (App IX)~~

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	—	COLOR: Clear	
2nd	—	ODOR: —	
		OTHER: —	

pH — Temperature — (C) Dissolved Oxygen — (mg/L) Specific Conductivity — (umhos/cm)
Iron — (mg/L) Oxidation/Reduction Potential — (mv) Turbidity — (NTU)

GENERAL INFORMATION

WEATHER: SUN/CLEAR — OVERCAST/RAIN — WIND DIRECTION — AMBIENT TEMPERATURE —
SHIPMENT VIA: FEDEX x HAND DELIVER ___ COURIER ___ OTHER ___
SHIPPED TO: STL - Chicago
COMMENTS:
SAMPLER: C. Williams OBSERVER: J. Wallace

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

APPENDIX C.7
1999 SOUTHERN LOBE TCE PLUME DELINEATION
CHAINS OF CUSTODY

STL
Committed To *Your* Success

Chicago Laboratory
2417 Bond Street
University Park, IL 60466
Phone: 708-534-5200
Fax: 708-534-5211

Report To:
Contact: Lynn Morgan
Company: HydroGeoLogic
Address: 1155 Herndon Pkwy Ste 900
Herndon VA 20170
Phone: (703) 478-5126
Fax: (703) 471-4180
E-Mail:

Bill To:
Contact:
Company:
Address:
Phone:
Fax:
PO#: Quote:

Shaded Areas For Internal Use Only of

Lab Lot #

Package Sealed Yes No	Samples Sealed Yes No
Received on Ice Yes No	Samples Intact Yes No
Temperature °C of Cooler	
Within Hold Time Yes No	Preserv. Indicated Yes No NA
pH Check ok Yes No NA	Res. Cl_2 Check ok Yes No NA
Sample Labels and COC Agree Yes No COC not present	

Sampler Name:
Signature:
Project Name:
Project Number: AFCCCA - 19CCD
Project Location: NAS Fort Worth JRB
Lab PM: MARY ASPER
Date Required Hard Copy: __/__/__ Fax: __/__/__

Refrg #													
# Cont.	2												
Volume	40ml												
Preserv	HCl												

Laboratory ID	MS-MSD	Client Sample ID	Sampling Date	Sampling Time	Matrix	Comp/Grab	VOCs										Additional Analyses / Remarks
		WHGLTA023WG01	7-7-99	1452			3										
		WHGLRW019WG01	7-7-99	930			3										
		WHGLRW018WG01	7-7-99	1215			3										
		TRIP01	7-7-99	900			3										
		EQ070799	7-7-99	1615			3										

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
[illegible]	HydroGeoLogic	7-7-99	1630				
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME

Matrix Key
WW = Wastewater
W = Water
S = Soil
SL = Sludge
MS = Miscellaneous
OL = Oil
A = Air
SE = Sediment
SO = Solid
DS = Drum Solid
DL = Drum Liquid
L = Leachate
WI = Wipe
O = _____

Container Key
1. Plastic
2. VOA Vial
3. Sterile Plastic
4. Amber Glass
5. Widemouth Glass
6. Other _____

Preservative Key
1. HCl, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn Acetate, Cool to 4°
6. Cool to 4°
7. None

COMMENTS:

Date Received __/__/__
Courier: Hand Delivered ☐
Bill of Lading:

524 3618 1.02

STL
Committed To *Your* Success

Chicago Laboratory
2417 Bond Street
University Park, IL 60466
Phone: 708-534-5200
Fax: 708-534-5211

Report To:
Contact: Lynn Morgan
Company: HydroGeologic
Address: 1155 Herndon Pkwy. Ste. 900, Herndon, VA
Phone: 703-478-5156
Fax: 703-478-4156
E-Mail:

Bill To:
Contact:
Company:
Address:
Phone:
Fax:
PO#: Quote:

Shaded Areas For Internal Use Only ___ of ___

Lab Lot #

Package Sealed Yes No	Samples Sealed Yes No
Received on Ice Yes No	Samples Intact Yes No
Temperature °C of Cooler	
Within Hold Time Yes No	Preserv. Indicated Yes No NA
pH Check ok Yes No NA	Res. Cl_2 Check ok Yes No NA
Sample Labels and COC Agree Yes No COC not present	

524 369

Sampler Name:
Signature:
Project Name: TCE Plume
Project Number: AFC001 19 CCD
Project Location: NAS Ft. Worth
Date Required Hard Copy: __/__/__ Fax: __/__/__
Lab PM: Donna Ingersoll

Refrg #													
#/ Cont.	3												
Volume	3												
Preserv	1												

Laboratory ID	MS-MSD	Client Sample ID	Sampling Date	Sampling Time	Matrix	Comp/Grab	VOCs	Additional Analyses / Remarks
		TB070899	7-8-99	730	W	G	2	
		EB070899		1515			3	
		WHGLTA022		955			3	
	X	WHGLTA022 MS		955			3	
	X	WHGLTA022 MD		955			3	
		WHGLTA025		1155			3	
		WHGLTA026		1415			3	

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
[illegible]	HGL	7-8-99	1600				
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME

Matrix Key
WW = Wastewater
W = Water
S = Soil
SL = Sludge
MS = Miscellaneous
OL = Oil
A = Air
SE = Sediment
SO = Solid
DS = Drum Solid
DL = Drum Liquid
L = Leachate
WI = Wipe
O = _____

Container Key
1. Plastic
2. VOA Vial
3. Sterile Plastic
4. Amber Glass
5. Widemouth Glass
6. Other _____

Preservative Key
1. HCl, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn Acetate, Cool to 4°
6. Cool to 4°
7. None

COMMENTS:

Date Received __/__/__
Courier: Hand Delivered ☐
Bill of Lading:

STL
Committed To *Your* Success

Chicago Laboratory
2417 Bond Street
University Park, IL 60466
Phone: 708-534-5200
Fax: 708-534-5211

Report To:
Contact: Jim Costello
Company: Hydrogeologic
Address: 1155 Herndon Pkwy
Herndon Va
Phone: 703/478-5186
Fax: 703/471-4180
E-Mail:

Bill To:
Contact: SAME
Company:
Address:
Phone:
Fax:
PO#: Quote:

Shaded Areas For Internal Use Only ___ of ___

Lab Lot #

Package Sealed Yes No	Samples Sealed Yes No
Received on Ice Yes No	Samples Intact Yes No
Temperature °C of Cooler	
Within Hold Time Yes No	Preserv. Indicated Yes No NA
pH Check ok Yes No NA	Res. Cl_2 Check ok Yes No NA
Sample Labels and COC Agree Yes No COC not present	

Sampler Name: Brad Nielsen
Signature: [signature]
Project Name: NAS Fort Worth TRB
Project Number: AFC001-19CCD
Project Location:
Date Required Hard Copy: __/__/__ Fax: __/__/__
Lab PM: Mary Asper

Refrg #														
# Cont.	3													
Volume	40ml													
Preserv	HCL 4°C													

Laboratory ID	MS-MSD	Client Sample ID	Sampling Date	Sampling Time	Matrix	Comp/Grab	VOCs/8260B	Additional Analyses / Remarks
		WHGLRW015WG01	7/28/99	1600	W	G	3	
		EB072899	7/28/99	1640	W	G	3	
		TB072899	7/28/99	1652	W	G	3	

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
[signature]	HGL	7/28/99	1730				
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME

Matrix Key
WW = Wastewater
W = Water
S = Soil
SL = Sludge
MS = Miscellaneous
OL = Oil
A = Air
SE = Sediment
SO = Solid
DS = Drum Solid
DL = Drum Liquid
L = Leachate
WI = Wipe
O = _____

Container Key
1. Plastic
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Preservative Key
1. HCl, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn Acetate, Cool to 4°
6. Cool to 4°
7. None

COMMENTS:

Date Received __/__/__
Courier: Hand Delivered ☐
Bill of Lading:

STL Chicago Chain of Custody: CHI-22-09-231/A-5/99.

524 370

STL
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Chicago Laboratory
2417 Bond Street
University Park, IL 60466
Phone: 708-534-5200
Fax: 708-534-5211

Report To:
Contact: Jim Cotello
Company: Hydrogeologic
Address: 1155 Herndon Pkwy
Phone: 703/478-5786
Fax: 703/471-4180
E-Mail:

Bill To:
Contact: same
Company:
Address:
Phone:
Fax:
PO#: Quote:

Shaded Areas For Internal Use Only ___ of ___

Lab Lot #

Package Sealed Yes No	Samples Sealed Yes No
Received on Ice Yes No	Samples Intact Yes No
Temperature °C of Cooler	

524 371

Sampler Name: Brad Welsen	Signature:
Project Name: TCE Investigation	Project Number: AF-COOH-19CCD
Project Location: NAS Fort Worth JRB	Date Required Hard Copy: / / Fax: / /
Lab PM: Rosio Ramirez	

Within Hold Time Yes No	Preserv. Indicated Yes No NA
pH Check ok Yes No NA	Res. Cl_2 Check ok Yes No NA
Sample Labels and COC Agree Yes No COC not present	

Laboratory ID	MS-MSD	Client Sample ID	Sampling Date	Sampling Time	Matrix	Comp/Grab	Refrg # / #/ Cont. / Volume / Preserv: VOC 8260B									Additional Analyses / Remarks
		WH6LRW016WG01	8/26/99	1445			3									
		~~WH6LRW017~~														
		WH6LRW017WG01	8/26/99	1620			3									

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
	HGL	8/26/99	1745				
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME

Matrix Key
WW = Wastewater
W = Water
S = Soil
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MS = Miscellaneous
OL = Oil
A = Air
SE = Sediment
SO = Solid
DS = Drum Solid
DL = Drum Liquid
L = Leachate
WI = Wipe
O = _____

Container Key
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3. Sterile Plastic
4. Amber Glass
5. Widemouth Glass
6. Other _____

Preservative Key
1. HCl, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn Acetate, Cool to 4°
6. Cool to 4°
7. None

COMMENTS:

Date Received / /
Courier: Hand Delivered ☐
Bill of Lading:

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Chicago Laboratory
2417 Bond Street
University Park, IL 60466
Phone: 708-534-5200
Fax: 708-534-5211

Report To:
Contact:
Company:
Address:
Phone:
Fax:
E-Mail:

Bill To:
Contact:
Company:
Address:
Phone:
Fax:
PO#: Quote:

Shaded Areas For Internal Use Only ___ of ___

Lab Lot #

Package Sealed Yes No	Samples Sealed Yes No
Received on Ice Yes No	Samples Intact Yes No
Temperature °C of Cooler	
Within Hold Time Yes No	Preserv. Indicated Yes No NA
pH Check ok Yes No NA	Res. Cl_2 Check ok Yes No NA
Sample Labels and COC Agree Yes No COC not present	

Sampler Name:
Signature:
Project Name:
Project Number:
Project Location:
Date Required Hard Copy: / / Fax: / /
Lab PM:

Laboratory ID	MS-MSD	Client Sample ID	Sampling Date	Sampling Time	Matrix	Comp/Grab	Refrg #	#/ Cont.	Volume	Preserv									Additional Analyses / Remarks
					W	G		3											
					W	G		3											
					W	G		3											
					W	G		3											
					W	G		3											
					W	G		3											
					W	G		3											

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
	HGL	07/24/02	17:45				
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME

Matrix Key
WW = Wastewater
W = Water
S = Soil
SL = Sludge
MS = Miscellaneous
OL = Oil
A = Air
SE = Sediment
SO = Solid
DS = Drum Solid
DL = Drum Liquid
L = Leachate
WI = Wipe
O = ____

Container Key
1. Plastic
2. VOA Vial
3. Sterile Plastic
4. Amber Glass
5. Widemouth Glass
6. Other ____

Preservative Key
1. HCl, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn Acetate, Cool to 4°
6. Cool to 4°
7. None

COMMENTS:

Date Received / /
Courier:
Hand Delivered ☐
Bill of Lading:

STL Chicago Chain of Custody: CHI-22-09-231/A-5/99

524 372

524 373

Shaded Areas For Internal Use Only ___ of ___

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Chicago Laboratory
2417 Bond Street
University Park, IL 60466
Phone: 708-534-5200
Fax: 708-534-5211

Report To:
Contact: Jim Costello
Company: HydroGeoLogic
Address: 1155 Herndon Pkwy
Suite 900
Phone: (703) 736-4507
Fax: 703-~~736~~ 471-4180
E-Mail: jac@hgl.com

Bill To:
Contact: Same
Company:
Address:
Phone:
Fax:
PO#: Quote:

Lab Lot #

Package Sealed Yes No	Samples Sealed Yes No
Received on Ice Yes No	Samples Intact Yes No
Temperature °C of Cooler	

Sampler Name: B. Nielsen
Signature:
Project Name: Groundwater Sampling
Project Number: AFC001-19CCD
Project Location: NAS Fort Worth TX
Date Required Hard Copy: __/__/__ Fax: __/__/__
Lab PM: Debra Rimmer

Within Hold Time Yes No	Preserv. Indicated Yes No NA
pH Check ok Yes No NA	Res. Cl_2 Check ok Yes No NA
Sample Labels and COC Agree Yes No COC not present	

Laboratory ID	MS-MSD	Client Sample ID	Sampling Date	Sampling Time	Matrix	Comp/Grab	VOCs SeO4									Additional Analyses / Remarks
Refrg #																
# Cont.																
Volume																
Preserv																
		WHGLRW018-WG02	7-15-99	1610	W	G	3									
		WHGLTA022-WG02	7-15-99	1250	W	G	3									
		~~EB071599~~	~~7-15-99~~	~~1700~~	~~W~~	~~G~~	~~3~~									~~3W~~
		TB091599	7-15-99	0750	W	G	3									

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
[signature]	HGL	9/15/99	1500				
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME

Matrix Key
WW = Wastewater
W = Water
S = Soil
SL = Sludge
MS = Miscellaneous
OL = Oil
A = Air
SE = Sediment
SO = Solid
DS = Drum Solid
DL = Drum Liquid
L = Leachate
WI = Wipe
O = _____

Container Key
1. Plastic
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3. Sterile Plastic
4. Amber Glass
5. Widemouth Glass
6. Other _____

Preservative Key
1. HCl, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn Acetate, Cool to 4°
6. Cool to 4°
7. None

COMMENTS:

Date Received __/__/__
Courier: Hand Delivered
Bill of Lading:

STL
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Chicago Laboratory
2417 Bond Street
University Park, IL 60466
Phone: 708-534-5200
Fax: 708-534-5211

Report To:
Contact: Jim Costello
Company: HydroGeologic
Address: 11155 Herndon Pkwy Suite 900
Phone: 703-736-4507
Fax: 703-471-4180
E-Mail: jcc@hgl.com

Bill To: (same)
Contact:
Company:
Address:
Phone:
Fax:
PO#: Quote:

Shaded Areas For Internal Use Only ___ of ___

Lab Lot #

Package Sealed Yes No	Samples Sealed Yes No
Received on Ice Yes No	Samples Intact Yes No
Temperature °C of Cooler	
Within Hold Time Yes No	Preserv. Indicated Yes No NA
pH Check ok Yes No NA	Res. Cl_2 Check ok Yes No NA
Sample Labels and COC Agree Yes No COC not present	

Sampler Name: Brad Nelson
Signature:
Project Name: Groundwater Sampling
Project Number: AFC001-19CCD
Project Location: NAS Fort Worth JRB
Date Required Hard Copy: / /
Fax: / /
Lab PM: Bosco Ramirez

Refrg #													
#/ Cont.													
Volume													
Preserv													

Laboratory ID	MS-MSD	Client Sample ID	Sampling Date	Sampling Time	Matrix	Comp/Grab	# of Cont.									Additional Analyses / Remarks
		TB0911699	9-16-99	0800	W	G	3									
		WHGLTA023-WG02	9-16-99	1215	W	G	3									
		WHGLRW016-WG02	9-16-99	1040	W	G	3									
		WHGLRW017-WG02	9-16-99	1525	W	G	3									
		EB0911699	9-16-99	1630	W	G	3									
		DUP-01	9-16-99	1200	W	G	3									

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
	HG	9/16/99	1745				
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME

Matrix Key
WW = Wastewater
W = Water
S = Soil
SL = Sludge
MS = Miscellaneous
OL = Oil
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L = Leachate
WI = Wipe
O = _____

Container Key
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2. VOA Vial
3. Sterile Plastic
4. Amber Glass
5. Widemouth Glass
6. Other _____

Preservative Key
1. HCl, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn Acetate, Cool to 4°
6. Cool to 4°
7. None

COMMENTS:

Date Received / /
Courier:
Hand Delivered ☐
Bill of Lading:

STL Chicago Chain of Custody: CHI-22-09-231/A-5/9

524 374

524 375

STL
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Chicago Laboratory
2417 Bond Street
University Park, IL 60466
Phone: 708-534-5200
Fax: 708-534-5211

Report To:
Contact: Lynn Moran
Company: Hole-Geologic
Address: 1155 Herndon Pkwy
Herndon, VA 20170
Phone: 703-756-4518
Fax: 703-478-4180
E-Mail: lmm@hol.com

Bill To:
Contact: SAME
Company:
Address:
Phone:
Fax:
PO#: Quote:

Shaded Areas For Internal Use Only ___ of ___

Lab Lot #

Package Sealed Yes No	Samples Sealed Yes No
Received on Ice Yes No	Samples Intact Yes No
Temperature °C	of Cooler
Within Hold Time Yes No	Preserv. indicated Yes No NA
pH Check ok Yes No NA	Res. Cl_2 Check ok Yes No NA
Sample Labels and COC Agree Yes No COC not present	

Sampler Name: Kan Tu
Signature: [illegible]
Project Name: System Sampling
Project Number: AFC 001 19 CE
Project Location: NAS Fort Worth JRB
Date Required Hard Copy: ~~11-15-99~~
Fax: ___/___/___
Lab PM: Mary Asper

Laboratory ID	MS-MSD	Client Sample ID	Sampling Date	Sampling Time	Matrix	Comp/Grab	VOCs 8260B	Methane 7000A	TOC 9060A	Alkalinity 310.1							Additional Analyses / Remarks
Refrg #																	
#/ Cont.							2	1	1	1							
Volume							40ml	1L	1L	1L							
Preserv							1	5	2	2							
		TB110199	11-1-99	1130	W	G	2										
		EFF001W08		1200	W	G	3	1	1	2							
		INFW08		1215	W	G	3										
		AS1-W08		1250	W	G	3										
		AS2-W08		1245	W	G	3										
		AS3-W08		1240	W	G	3										
		AS4-W08		1200	W	G	3										
		AS5-W08		1210	W	G	3										
		AS6-W08	↓	1254	W	G	3										

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
[illegible]	[illegible]	11/1/99	1730				
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME

Matrix Key
WW = Wastewater
W = Water
S = Soil
SL = Sludge
MS = Miscellaneous
OL = Oil
A = Air
SE = Sediment
SO = Solid
DS = Drum Solid
DL = Drum Liquid
L = Leachate
WI = Wipe
O = _____

Container Key
1. Plastic
2. VOA Vial
3. Sterile Plastic
4. Amber Glass
5. Widemouth Glass
6. Other _____

Preservative Key
1. HCl, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn Acetate, Cool to 4°
6. Cool to 4°
7. None

COMMENTS:
* Please list 1,2 isomers individually from total 1,2 DCE.

Date Received ___/___/___
Courier: FedEx Hand Delivered ☐
Bill of Lading: [illegible]

STL Chicago Chain of Custody: CHI-22-09-231/A-5/9

STL 190001

Committed To *Your* Success

Chicago Laboratory
2417 Bond Street
University Park, IL 60466
Phone: 708-534-5200
Fax: 708-534-5211

Report To:
Contact: Ivan Morgan
Company: HydroGeologic
Address: 1155 Herndon Pkwy Suite 500, Herndon VA 20170
Phone: 703-736-4518
Fax: 703-478-4180
E-Mail: ivan@hgl.com

To:
Contact: SAME
Company:
Address:
Phone:
Fax:
PO#: Quote:

Shaded Areas For Internal Use Only of

Lab Lot #

Package Sealed	Samples Sealed
Yes No	Yes No
Received on Ice	Samples Intact
Yes No	Yes No
Temperature °C of Cooler	

Within Hold Time	Preserv. Indicated
Yes No	Yes No NA
pH Check ok	Res. Cl_2 Check ok
Yes No NA	Yes No NA

Sample Labels and COC Agree
Yes No COC not present

Sampler Name: Catherine Williams
Signature:
Project Name: Plume Delineation
Project Number: AF001-19CCD
Project Location: NAS Fort Worth JRB
Date Required Hard Copy: __/__/__ Fax: __/__/__
Lab PM: Rosco Ramirez

Refrg #													
# Cont.	2	1	2	4									
Volume	40ml	1L	40ml	1L									
Preserv	1	3	1	6									

Laboratory ID	MS-MSD	Client Sample ID	Sampling Date	Sampling Time	Matrix	Comp/Grab	VOC's SW8260B	Total Metals AF001	VOC's SW8260B Approx. Quant	SVOCs Approx. Quant							Additional Analyses / Remarks
		TB110199	11-1-99	1400	W	G	2										
		EB110199	11-1-99	1745	W	G	3										
		WHGLRW018WG03	11-1-99	1605	W	G	3										
		WHGLTA901WG03	11-2-99	1000	W	G		1	3	2							
		WHGLTA023WG03	11-2-99	1518	W	G	3										
		WHGLTA104WG03	11-2-99	1715	W	G		1	3	2							
		TB110299	11-2-99	815	W	G	2										

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
[illegible]	[illegible]	11/2/99	1900				
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME

Matrix Key
WW = Wastewater
W = Water
S = Soil
SL = Sludge
MS = Miscellaneous
OL = Oil
A = Air
SE = Sediment
SO = Solid
DS = Drum Solid
DL = Drum Liquid
L = Leachate
WI = Wipe
O = _____

Container Key
1. Plastic
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4. Amber Glass
5. Widemouth Glass
6. Other _____

Preservative Key
1. HCl, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn Acetate, Cool to 4°
6. Cool to 4°
7. None

COMMENTS:
#- + 1.2 15-DCE
Samples collected on 11-2-99 including equipment blank
AF001-023E, EB110299.

Date Received / /
Courier: Fed Ex Hand Delivered ☐
Bill of Lading: 2141-2193-[illegible]

STL Chicago Chain of Custody: CHI-22-09-231/A-5/99.

524.376

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190002

Chicago Laboratory
2417 Bond Street
University Park, IL 60466
Phone: 708-534-5200
Fax: 708-534-5211

Report To:
Contact: Lynn Alvarez
Company: Hydrochem Inc.
Address: 11 Sc Herndon Pkwy Suite 900 Herndon VA 1170
Phone: 703-736-4518
Fax: 703-938-4120
E-Mail: lynn@hal.com

Bill To:
Contact: same
Company:
Address:
Phone:
Fax:
PO#: Quote:

Shaded Areas For Internal Use Only ___ of ___

Lab Lot #

Package Sealed Yes No	Samples Sealed Yes No
Received on Ice Yes No	Samples Intact Yes No
Temperature °C of Cooler	
Within Hold Time Yes No	Preserv. Indicated Yes No NA
pH Check ok Yes No NA	Res. Cl_2 Check ok Yes No NA
Sample Labels and COC Agree Yes No COC not present	

524 377

Sampler Name: Catherine Williams
Signature: Catherine Williams
Project Name: Plume Investigation
Project Number: ATC 001 19 CCD
Project Location: NAS Fort Worth JRB
Date Required Hard Copy: __/__/__ Fax: __/__/__
Lab PM: Rosa Ramirez

Refrg #
#/ Cont. 2
Volume 40 ml
Preserv

Laboratory ID	MS-MSD	Client Sample ID	Sampling Date	Sampling Time	Matrix	Comp/Grab	VOC 8260		Additional Analyses / Remarks
		~~TB110319~~	~~11/3/99~~	~~1115~~	~~W~~	~~G~~	~~2~~	~~N~~	
		WHGLRW016W003	11/3/99	1024	W	G	3		
		WHGLRW017W003	↓	1205	W	G	3		
		WHGLTA022W003	↓	1753	W	G	3		
		AP110349	↓	1310	W	G	3		

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
[illegible]	Hydrochem	11/3/99	[illegible]				

Matrix Key
WW = Wastewater
W = Water
S = Soil
SL = Sludge
MS = Miscellaneous
OL = Oil
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L = Leachate
WI = Wipe
O = _____

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3. Sterile Plastic
4. Amber Glass
5. Widemouth Glass
6. Other _____

Preservative Key
1. HCl, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn Acetate, Cool to 4°
6. Cool to 4°
7. None

COMMENTS:
TB110317 & EQ110297 are associated w/ 202
[illegible]

Date Received __/__/__
Courier: [illegible] Hand Delivered ☐
Bill of Lading: [illegible]

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190003

Chicago Laboratory
2417 Bond Street
University Park, IL 60466
Phone: 708-534-5200
Fax: 708-534-5211

Report To:
Contact: [illegible]
Company: [illegible]
Address: [illegible]
Phone: [illegible]
Fax: [illegible]
E-Mail: [illegible]

To:
Contact: [illegible]
Company:
Address:
Phone:
Fax:
PO#: Quote:

Shaded Areas For Internal Use Only of

Lab Lot #

Package Sealed Yes No	Samples Sealed Yes No
Received on Ice Yes No	Samples Intact Yes No
Temperature °C of Cooler	
Within Hold Time Yes No	Preserv. Indicated Yes No NA
pH Check ok Yes No NA	Res. Cl_2 Check ok Yes No NA
Sample Labels and COC Agree Yes No COC not present	

Sampler Name: [illegible]
Signature: [illegible]
Project Name: Flume Laboratory
Project Number: AR-C001 19CCD
Project Location: [illegible]
Date Required Hard Copy: __/__/__ Fax: __/__/__
Lab PM: Bosco Ramirez

Laboratory ID	MS-MSD	Client Sample ID	Sampling Date	Sampling Time	Matrix	Comp/Grab	# Cont.	Additional Analyses / Remarks
		T8110499	11-9-99	775	W	G	2	
		WHGLRW019WG03	1	950	W	G	3	
	X	WHGLRW019WG03MS	1	950	W	G	3	
	X	WHGLRW019WG03MD	1	950	W	G	3	
		WHGLTA023WG03	1	1205	W	G	3	
		EB110499	1	1715	W	G	3	
		WHGLRW015	1	1235	W	G	3	
		Dup01 WG03	1	1200	W	G	3	

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
[illegible]	[illegible]	11-9-99	1710				
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME

Matrix Key
WW = Wastewater
W = Water
S = Soil
SL = Sludge
MS = Miscellaneous
OL = Oil
A = Air
SE = Sediment
SO = Solid
DS = Drum Solid
DL = Drum Liquid
L = Leachate
WI = Wipe
O = _____

Container Key
1. Plastic
2. VOA Vial
3. Sterile Plastic
4. Amber Glass
5. Widemouth Glass
6. Other _____

Preservative Key
1. HCl, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn Acetate, Cool to 4°
6. Cool to 4°
7. None

COMMENTS:

Date Received __/__/__
Courier: Hand Delivered ☐
Bill of Lading: [illegible]

STL Chicago Chain of Custody: CHI-22-09-231/A-5/99

524 378 SC

STL
Committed To Your Success

19000

Chicago Laboratory
2417 Bond Street
University Park, IL 60466
Phone: 708-534-5200
Fax: 708-534-5211

Report To:
Contact: Ivan [illegible]
Company: [illegible]
Address: [illegible]
Phone: [illegible]
Fax: [illegible]
E-Mail: [illegible]

Bill To:
Contact:
Company:
Address:
Phone:
Fax:
PO#: Quote:

Shaded Areas For Internal Use Only ___ of ___

Lab Lot #

Package Sealed Yes No	Samples Sealed Yes No
Received on Ice Yes No	Samples Intact Yes No
Temperature °C of Cooler	
Within Hold Time Yes No	Preserv. indicated Yes No NA
pH Check ok Yes No NA	Res. Cl_2 Check ok Yes No NA
Sample Labels and COC Agree Yes No COC not present	

524 379

Sampler Name: JENNIFER WALLACE
Signature: [signature]
Project Name: Lake Calumet
Project Number: AFCOI - MCCD
Project Location: [illegible]
Date Required Hard Copy: __/__/__ Fax: __/__/__
Lab PM: [illegible]

Laboratory ID	MS-MSD	Client Sample ID	Sampling Date	Sampling Time	Matrix	Comp/Grab	Refrg #	# Cont.	Volume	Preserv	Additional Analyses / Remarks
		WHGLTAD2DWG03	11-5-99	0940	W	G		3			
		WHGLTAD2DWG03	1	1055	W	G		3			
		FB110599	1	1050	W	G		3			
		TB110599	↓	0945	W	G		2			

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
[illegible]	[illegible]	11-5-99	1200				
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME

Matrix Key
WW = Wastewater
W = Water
S = Soil
SL = Sludge
MS = Miscellaneous
OL = Oil
A = Air
SE = Sediment
SO = Solid
DS = Drum Solid
DL = Drum Liquid
L = Leachate
WI = Wipe
O = _____

Container Key
1. Plastic
2. VOA Vial
3. Sterile Plastic
4. Amber Glass
5. Widemouth Glass
6. Other _____

Preservative Key
1. HCl, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn Acetate, Cool to 4°
6. Cool to 4°
7. None

COMMENTS:

Date Received __/__/__
Courier: [illegible] Hand Delivered ☐
Bill of Lading: [illegible]

TAB

Appendix D

APPENDIX D

ANALYTICAL RESULTS from 1999 SOUTHERN LOBE TCE PLUME DELINEATION

Appendix D
Analytical Results from 1999 Southern Lobe TCE Plume Delineation
NAS Fort Worth JRB

Analytical Method/Analyte	UNITS	Reporting Limit	WHGLRW015			
			N	N	N	FD
			7/28/99	9/14/99	11/4/99	11/4/99
1,1,1,2-TETRACHLOROETHANE	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
1,1,1-TRICHLOROETHANE	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
1,1,2,2-TETRACHLOROETHANE	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
1,1,2-TRICHLOROETHANE	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
1,1-DICHLOROETHANE	µg/L	0.4	1 U	0.4 U	0.4 U	0.4 U
1,1-DICHLOROETHENE	µg/L	0.5	1 U	0.5 U	0.5 UJ	0.5 UJ
1,1-DICHLOROPROPENE	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
1,2,3-TRICHLOROBENZENE	µg/L	0.5	2 U	0.5 U	0.5 U	0.5 U
1,2,3-TRICHLOROPROPANE	µg/L	0.5	3 U	0.5 U	0.5 U	0.5 U
1,2,4-TRICHLOROBENZENE	µg/L	0.4	1 U	0.4 U	0.4 U	0.4 U
1,2,4-TRIMETHYLBENZENE	µg/L	0.5	1 U	0.5 U	0.5 UJ	0.5 UJ
1,2-DIBROMO-3-CHLOROPROPANE	µg/L	0.5	3 U	0.5 U	0.5 U	0.5 U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROBENZENE	µg/L	0.3	1 U	0.3 U	0.3 U	0.3 U
1,2-DICHLOROETHANE	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROPROPANE	µg/L	0.4	1 U	0.4 U	0.4 U	0.4 U
1,3,5-TRIMETHYLBENZENE (MESITYLENE)	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
1,3-DICHLOROBENZENE	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
1,3-DICHLOROPROPANE	µg/L	0.4	1 U	0.4 U	0.4 U	0.4 U
1,4-DICHLOROBENZENE	µg/L	0.3	1 U	0.3 U	0.3 U	0.3 U
1-CHLOROHEXANE	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
2,2-DICHLOROPROPANE	µg/L	0.5	4 U	0.5 U	0.5 U	0.5 U
2-CHLORO-1,3-BUTADIENE	µg/L	10	10 U	--	--	--
2-CHLOROTOLUENE	µg/L	0.4	1 U	0.4 U	0.4 U	0.4 U
2-HEXANONE	µg/L	20	20 U	--	--	--
4-CHLOROTOLUENE	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
ACETONE	µg/L	20	20 U	--	--	--
ACETONITRILE	µg/L	100	100 U	--	--	--
ACROLEIN	µg/L	100	100 U	--	--	--
ACRYLONITRILE	µg/L	100	100 U	--	--	--
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	10	10 U	--	--	--
BENZENE	µg/L	0.4	1 U	0.4 U	0.4 U	0.4 U
BROMOBENZENE	µg/L	0.3	1 U	0.3 U	0.3 U	0.3 U
BROMOCHLOROMETHANE	µg/L	0.4	1 U	0.4 U	0.4 U	0.4 U
BROMODICHLOROMETHANE	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
BROMOFORM	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
BROMOMETHANE	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
CARBON DISULFIDE	µg/L	5	5 U	--	--	--
CARBON TETRACHLORIDE	µg/L	0.5	2 U	0.5 U	0.5 U	0.5 U

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Appendix D
Analytical Results from 1999 Southern Lobe TCE Plume Delineation
NAS Fort Worth JRB

Analytical Method/Analyte	UNITS	Reporting Limit	WHGLRW015			
			N	N	N	FD
			7/28/99	9/14/99	11/4/99	11/4/99
CHLOROBENZENE	µg/L	0.4	1 U	0.4 U	0.4 U	0.4 U
CHLOROETHANE	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
CHLOROFORM	µg/L	0.3	1 U	0.3 U	0.3 U	0.3 U
CHLOROMETHANE	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
CIS-1,2-DICHLOROETHYLENE	µg/L	0.5	15	12	7	7
CIS-1,3-DICHLOROPROPENE	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
DIBROMOCHLOROMETHANE	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
DIBROMOMETHANE	µg/L	0.5	2 U	0.5 U	0.5 U	0.5 U
DICHLORODIFLUOROMETHANE	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
ETHYL METHACRYLATE	µg/L	5	5 U	--	--	--
ETHYLBENZENE	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
HEXACHLOROBUTADIENE	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
IODOMETHANE (METHYL IODIDE)	µg/L	5	5 U	--	--	--
ISOBUTANOL	µg/L	200	200 U	--	--	--
ISOPROPYLBENZENE (CUMENE)	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
M,P-XYLENE (SUM OF ISOMERS)	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
METHYL ETHYL KETONE (2-BUTANONE)	µg/L	20	20 U	--	--	--
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	µg/L	20	20 U	--	--	--
METHYL METHACRYLATE	µg/L	5	5 U	--	--	--
METHYLACRYLONITRILE	µg/L	100	100 U	--	--	--
METHYLENE CHLORIDE	µg/L	0.5	1 UJ	0.5 U	0.5 R	0.5 R
NAPHTHALENE	µg/L	0.5	2 U	0.5 U	0.5 U	0.5 U
N-BUTYLBENZENE	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
N-PROPYLBENZENE	µg/L	0.4	1 U	0.4 U	0.4 U	0.4 U
O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
P-CYMENE (P-ISOPROPYLTOLUENE)	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
PROPANE NITRILE (PROPIONITRILE)	µg/L	100	100 U	--	--	--
SEC-BUTYLBENZENE	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
STYRENE	µg/L	0.4	1 U	0.4 U	0.4 UJ	0.4 UJ
T-BUTYLBENZENE	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
TETRACHLOROETHYLENE(PCE)	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
TOLUENE	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
TRANS-1,2-DICHLOROETHENE	µg/L	0.5	1 U	0.5 U	0.5 UJ	0.5 UJ
TRANS-1,3-DICHLOROPROPENE	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U
TRANS-1,4-DICHLORO-2-BUTENE	µg/L	25	25 U	--	--	--
TRICHLOROETHYLENE (TCE)	µg/L	0.5	42	34	24	24
TRICHLOROFLUOROMETHANE	µg/L	0.5	1 U	0.5 U	0.5 R	0.5 R
VINYL ACETATE	µg/L	2	10 U	2 U	2 U	2 U
VINYL CHLORIDE	µg/L	0.5	1 U	0.5 U	0.5 U	0.5 U

Notes:
FD - Field duplicate
N - Original sample
-- - Not anaylzed

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Appendix D
Analytical Results from 1999 Southern Lobe TCE Plume Delineation
NAS Fort Worth JRB

Analytical Method/Analyte	UNITS	Reporting Limit	WHGLRW016			
			N	N	FD	N
			8/26/99	9/16/99	9/16/99	11/3/99
1,1,1,2-TETRACHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
1,1,1-TRICHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2,2-TETRACHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-TRICHLOROETHANE	µg/L	0.5	0.5 R	0.5 U	0.5 U	0.5 U
1,1-DICHLOROETHANE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U
1,1-DICHLOROETHENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
1,1-DICHLOROPROPENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-TRICHLOROBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-TRICHLOROPROPANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-TRICHLOROBENZENE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U
1,2,4-TRIMETHYLBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DIBROMO-3-CHLOROPROPANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROBENZENE	µg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U
1,2-DICHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROPROPANE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U
1,3,5-TRIMETHYLBENZENE (MESITYLENE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
1,3-DICHLOROBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
1,3-DICHLOROPROPANE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U
1,4-DICHLOROBENZENE	µg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U
1-CHLOROHEXANE	µg/L	0.5	0.5 R	0.5 U	0.5 U	0.5 U
2,2-DICHLOROPROPANE	µg/L	0.5	0.5 R	0.5 U	0.5 U	0.5 U
2-CHLORO-1,3-BUTADIENE	µg/L	10	--	--	--	--
2-CHLOROTOLUENE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U
2-HEXANONE	µg/L	20	--	--	--	--
4-CHLOROTOLUENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
ACETONE	µg/L	20	--	--	--	--
ACETONITRILE	µg/L	100	--	--	--	--
ACROLEIN	µg/L	100	--	--	--	--
ACRYLONITRILE	µg/L	100	--	--	--	--
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	10	--	--	--	--
BENZENE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U
BROMOBENZENE	µg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U
BROMOCHLOROMETHANE	µg/L	0.4	0.4 R	0.4 U	0.4 U	0.4 U
BROMODICHLOROMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
BROMOFORM	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
BROMOMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
CARBON DISULFIDE	µg/L	5	--	--	--	--
CARBON TETRACHLORIDE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U

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Appendix D
Analytical Results from 1999 Southern Lobe TCE Plume Delineation
NAS Fort Worth JRB

Analytical Method/Analyte	UNITS	Reporting Limit	WHGLRW016			
			N	N	FD	N
			8/26/99	9/16/99	9/16/99	11/3/99
CHLOROBENZENE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U
CHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROFORM	µg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U
CHLOROMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 R	0.5 U
CIS-1,2-DICHLOROETHYLENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
CIS-1,3-DICHLOROPROPENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
DIBROMOCHLOROMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
DIBROMOMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
DICHLORODIFLUOROMETHANE	µg/L	0.5	0.5 R	0.5 U	0.5 R	0.5 U
ETHYL METHACRYLATE	µg/L	5	--	--	--	--
ETHYLBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
HEXACHLOROBUTADIENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
IODOMETHANE (METHYL IODIDE)	µg/L	5	--	--	--	--
ISOBUTANOL	µg/L	200	--	--	--	--
ISOPROPYLBENZENE (CUMENE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
M,P-XYLENE (SUM OF ISOMERS)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
METHYL ETHYL KETONE (2-BUTANONE)	µg/L	20	--	--	--	--
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	µg/L	20	--	--	--	--
METHYL METHACRYLATE	µg/L	5	--	--	--	--
METHYLACRYLONITRILE	µg/L	100	--	--	--	--
METHYLENE CHLORIDE	µg/L	0.5	0.5 R	0.5 U	0.5 U	0.5 R
NAPHTHALENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
N-BUTYLBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
N-PROPYLBENZENE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U
O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
P-CYMENE (P-ISOPROPYLTOLUENE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
PROPANE NITRILE (PROPIONITRILE)	µg/L	100	--	--	--	--
SEC-BUTYLBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
STYRENE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U
T-BUTYLBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
TETRACHLOROETHYLENE(PCE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
TOLUENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
TRANS-1,2-DICHLOROETHENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
TRANS-1,3-DICHLOROPROPENE	µg/L	0.5	0.5 R	0.5 U	0.5 U	0.5 U
TRANS-1,4-DICHLORO-2-BUTENE	µg/L	25	--	--	--	--
TRICHLOROETHYLENE (TCE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U
TRICHLOROFLUOROMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 R
VINYL ACETATE	µg/L	2	2 U	2 U	2 U	2 U
VINYL CHLORIDE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U

Notes:
FD - Field duplicate
N - Original sample
-- - Not anaylzed

524 385

Appendix D
Analytical Results from 1999 Southern Lobe TCE Plume Delineation
NAS Fort Worth JRB

Analytical Method/Analyte	UNITS	Reporting Limit	WHGLRW017			WHGLRW018			
			N	N	N	N	FD	N	N
			8/26/99	9/16/99	11/3/99	7/7/99	7/7/99	9/15/99	11/1/99
1,1,1,2-TETRACHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,1-TRICHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2,2-TETRACHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-TRICHLOROETHANE	µg/L	0.5	0.5 R	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-DICHLOROETHANE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,1-DICHLOROETHENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-DICHLOROPROPENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-TRICHLOROBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-TRICHLOROPROPANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-TRICHLOROBENZENE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,2,4-TRIMETHYLBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DIBROMO-3-CHLOROPROPANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROBENZENE	µg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,2-DICHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROPROPANE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,3,5-TRIMETHYLBENZENE (MESITYLENE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3-DICHLOROBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3-DICHLOROPROPANE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,4-DICHLOROBENZENE	µg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1-CHLOROHEXANE	µg/L	0.5	0.5 R	0.5 U	0.5 U	0.5 R	0.5 R	0.5 U	0.5 U
2,2-DICHLOROPROPANE	µg/L	0.5	0.5 R	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-CHLORO-1,3-BUTADIENE	µg/L	10	--	--	--	--	--	--	--
2-CHLOROTOLUENE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2-HEXANONE	µg/L	20	--	--	--	--	--	--	--
4-CHLOROTOLUENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ACETONE	µg/L	20	--	--	--	--	--	--	--
ACETONITRILE	µg/L	100	--	--	--	--	--	--	--
ACROLEIN	µg/L	100	--	--	--	--	--	--	--
ACRYLONITRILE	µg/L	100	--	--	--	--	--	--	--
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	10	--	--	--	--	--	--	--
BENZENE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
BROMOBENZENE	µg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
BROMOCHLOROMETHANE	µg/L	0.4	0.4 R	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
BROMODICHLOROMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
BROMOFORM	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
BROMOMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CARBON DISULFIDE	µg/L	5	--	--	--	--	--	--	--
CARBON TETRACHLORIDE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

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Appendix D
Analytical Results from 1999 Southern Lobe TCE Plume Delineation
NAS Fort Worth JRB

Analytical Method/Analyte	UNITS	Reporting Limit	WHGLRW017			WHGLRW018			
			N	N	N	N	FD	N	N
			8/26/99	9/16/99	11/3/99	7/7/99	7/7/99	9/15/99	11/1/99
CHLOROBENZENE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
CHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROFORM	µg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
CHLOROMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CIS-1,2-DICHLOROETHYLENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CIS-1,3-DICHLOROPROPENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
DIBROMOCHLOROMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
DIBROMOMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
DICHLORODIFLUOROMETHANE	µg/L	0.5	0.5 R	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ETHYL METHACRYLATE	µg/L	5	--	--	--	--	--	--	--
ETHYLBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
HEXACHLOROBUTADIENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
IODOMETHANE (METHYL IODIDE)	µg/L	5	--	--	--	--	--	--	--
ISOBUTANOL	µg/L	200	--	--	--	--	--	--	--
ISOPROPYLBENZENE (CUMENE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
M,P-XYLENE (SUM OF ISOMERS)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
METHYL ETHYL KETONE (2-BUTANONE)	µg/L	20	--	--	--	--	--	--	--
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	µg/L	20	--	--	--	--	--	--	--
METHYL METHACRYLATE	µg/L	5	--	--	--	--	--	--	--
METHYLACRYLONITRILE	µg/L	100	--	--	--	--	--	--	--
METHYLENE CHLORIDE	µg/L	0.5	0.5 R	0.5 U	0.5 R	0.5 U	0.5 U	0.5 U	0.5 U
NAPHTHALENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
N-BUTYLBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
N-PROPYLBENZENE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
P-CYMENE (P-ISOPROPYLTOLUENE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
PROPANE NITRILE (PROPIONITRILE)	µg/L	100	--	--	--	--	--	--	--
SEC-BUTYLBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
STYRENE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
T-BUTYLBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TETRACHLOROETHYLENE(PCE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TOLUENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRANS-1,2-DICHLOROETHENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRANS-1,3-DICHLOROPROPENE	µg/L	0.5	0.5 R	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRANS-1,4-DICHLORO-2-BUTENE	µg/L	25	--	--	--	--	--	--	--
TRICHLOROETHYLENE (TCE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRICHLOROFLUOROMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 R	0.5 U	0.5 U	0.5 U	0.5 U
VINYL ACETATE	µg/L	2	2 U	2 U	2 U	2 U	2 U	2 U	2 U
VINYL CHLORIDE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Notes:
FD - Field duplicate
N - Original sample
-- - Not anayized

524 387

Appendix D
Analytical Results from 1999 Southern Lobe TCE Plume Delineation
NAS Fort Worth JRB

Analytical Method/Analyte	UNITS	Reporting Limit	WHGLRW019			WHGLTA020		
			N	N	N	N	N	N
			7/7/99	9/14/99	11/4/99	7/8/99	9/15/99	11/5/99
1,1,1,2-TETRACHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,1-TRICHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2,2-TETRACHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-TRICHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-DICHLOROETHANE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,1-DICHLOROETHENE	µg/L	0.5	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
1,1-DICHLOROPROPENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-TRICHLOROBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-TRICHLOROPROPANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-TRICHLOROBENZENE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,2,4-TRIMETHYLBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
1,2-DIBROMO-3-CHLOROPROPANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROBENZENE	µg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,2-DICHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROPROPANE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,3,5-TRIMETHYLBENZENE (MESITYLENE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3-DICHLOROBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3-DICHLOROPROPANE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,4-DICHLOROBENZENE	µg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1-CHLOROHEXANE	µg/L	0.5	0.5 R	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2,2-DICHLOROPROPANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-CHLORO-1,3-BUTADIENE	µg/L	10	--	--	--	--	--	--
2-CHLOROTOLUENE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2-HEXANONE	µg/L	20	--	--	--	--	--	--
4-CHLOROTOLUENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ACETONE	µg/L	20	--	--	--	--	--	--
ACETONITRILE	µg/L	100	--	--	--	--	--	--
ACROLEIN	µg/L	100	--	--	--	--	--	--
ACRYLONITRILE	µg/L	100	--	--	--	--	--	--
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	10	--	--	--	--	--	--
BENZENE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
BROMOBENZENE	µg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
BROMOCHLOROMETHANE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
BROMODICHLOROMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
BROMOFORM	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
BROMOMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CARBON DISULFIDE	µg/L	5	--	--	--	--	--	--
CARBON TETRACHLORIDE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

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Appendix D
Analytical Results from 1999 Southern Lobe TCE Plume Delineation
NAS Fort Worth JRB

Analytical Method/Analyte	UNITS	Reporting Limit	WHGLRW019			WHGLTA020		
			N	N	N	N	N	N
			7/7/99	9/14/99	11/4/99	7/8/99	9/15/99	11/5/99
CHLOROBENZENE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
CHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROFORM	µg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
CHLOROMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CIS-1,2-DICHLOROETHYLENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CIS-1,3-DICHLOROPROPENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
DIBROMOCHLOROMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
DIBROMOMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
DICHLORODIFLUOROMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ETHYL METHACRYLATE	µg/L	5	--	--	--	--	--	--
ETHYLBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
HEXACHLOROBUTADIENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
IODOMETHANE (METHYL IODIDE)	µg/L	5	--	--	--	--	--	--
ISDBUTANOL	µg/L	200	--	--	--	--	--	--
ISOPROPYLBENZENE (CUMENE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
M,P-XYLENE (SUM OF ISOMERS)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
METHYL ETHYL KETONE (2-BUTANONE)	µg/L	20	--	--	--	--	--	--
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	µg/L	20	--	--	--	--	--	--
METHYL METHACRYLATE	µg/L	5	--	--	--	--	--	--
METHYLACRYLONITRILE	µg/L	100	--	--	--	--	--	--
METHYLENE CHLORIDE	µg/L	0.5	0.5 U	0.5 U	0.5 R	0.5 U	0.5 U	0.5 R
NAPHTHALENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
N-BUTYLBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
N-PROPYLBENZENE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
P-CYMENE (P-ISOPROPYLTOLUENE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
PROPANE NITRILE (PROPIONITRILE)	µg/L	100	--	--	--	--	--	--
SEC-BUTYLBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
STYRENE	µg/L	0.4	0.4 U	0.4 U	0.4 UJ	0.4 U	0.4 U	0.4 U
T-BUTYLBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TETRACHLOROETHYLENE(PCE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TOLUENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRANS-1,2-DICHLOROETHENE	µg/L	0.5	0.5 U	0.5 U	0.5 R	0.5 U	0.5 U	0.5 U
TRANS-1,3-DICHLOROPROPENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRANS-1,4-DICHLORO-2-BUTENE	µg/L	25	--	--	--	--	--	--
TRICHLOROETHYLENE (TCE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.8	0.5 U	0.5 U
TRICHLOROFLUOROMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 R
VINYL ACETATE	µg/L	2	2 U	2 U	2 U	2 U	2 U	2 U
VINYL CHLORIDE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Notes:
FD - Field duplicate
N - Original sample
-- - Not anaylzed

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Appendix D
Analytical Results from 1999 Southern Lobe TCE Plume Delineation
NAS Fort Worth JRB

Analytical Method/Analyte	UNITS	Reporting Limit	WHGLTA022			WHGLTA023		
			N	N	N	N	N	N
			7/8/99	9/15/99	11/3/99	7/7/99	9/16/99	11/4/99
1,1,1,2-TETRACHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,1-TRICHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2,2-TETRACHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-TRICHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-DICHLOROETHANE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,1-DICHLOROETHENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
1,1-DICHLOROPROPENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-TRICHLOROBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-TRICHLOROPROPANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-TRICHLOROBENZENE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,2,4-TRIMETHYLBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
1,2-DIBROMO-3-CHLOROPROPANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROBENZENE	µg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,2-DICHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROPROPANE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,3,5-TRIMETHYLBENZENE (MESITYLENE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3-DICHLOROBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3-DICHLOROPROPANE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,4-DICHLOROBENZENE	µg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1-CHLOROHEXANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 R	0.5 U	0.5 U
2,2-DICHLOROPROPANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-CHLORO-1,3-BUTADIENE	µg/L	10	--	--	--	--	--	--
2-CHLOROTOLUENE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2-HEXANONE	µg/L	20	--	--	--	--	--	--
4-CHLOROTOLUENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ACETONE	µg/L	20	--	--	--	--	--	--
ACETONITRILE	µg/L	100	--	--	--	--	--	--
ACROLEIN	µg/L	100	--	--	--	--	--	--
ACRYLONITRILE	µg/L	100	--	--	--	--	--	--
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	10	--	--	--	--	--	--
BENZENE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
BROMOBENZENE	µg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
BROMOCHLOROMETHANE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
BROMODICHLOROMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
BROMOFORM	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
BROMOMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CARBON DISULFIDE	µg/L	5	--	--	--	--	--	--
CARBON TETRACHLORIDE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

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Appendix D
Analytical Results from 1999 Southern Lobe TCE Plume Delineation
NAS Fort Worth JRB

Analytical Method/Analyte	UNITS	Reporting Limit	WHGLTA022			WHGLTA023		
			N	N	N	N	N	N
			7/8/99	9/15/99	11/3/99	7/7/99	9/16/99	11/4/99
CHLOROBENZENE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
CHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROFORM	µg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
CHLOROMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CIS-1,2-DICHLOROETHYLENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CIS-1,3-DICHLOROPROPENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
DIBROMOCHLOROMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
DIBROMOMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
DICHLORODIFLUOROMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ETHYL METHACRYLATE	µg/L	5	--	--	--	--	--	--
ETHYLBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
HEXACHLOROBUTADIENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
IODOMETHANE (METHYL IODIDE)	µg/L	5	--	--	--	--	--	--
ISOBUTANOL	µg/L	200	--	--	--	--	--	--
ISOPROPYLBENZENE (CUMENE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
M,P-XYLENE (SUM OF ISOMERS)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
METHYL ETHYL KETONE (2-BUTANONE)	µg/L	20	--	--	--	--	--	--
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	µg/L	20	--	--	--	--	--	--
METHYL METHACRYLATE	µg/L	5	--	--	--	--	--	--
METHYLACRYLONITRILE	µg/L	100	--	--	--	--	--	--
METHYLENE CHLORIDE	µg/L	0.5	0.5 U	0.5 U	0.5 R	0.5 U	0.5 U	0.5 R
NAPHTHALENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	2 J	0.5 U	0.5 U
N-BUTYLBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
N-PROPYLBENZENE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
P-CYMENE (P-ISOPROPYLTOLUENE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
PROPANE NITRILE (PROPIONITRILE)	µg/L	100	--	--	--	--	--	--
SEC-BUTYLBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
STYRENE	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 UJ
T-BUTYLBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TETRACHLOROETHYLENE(PCE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TOLUENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRANS-1,2-DICHLOROETHENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 R
TRANS-1,3-DICHLOROPROPENE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRANS-1,4-DICHLORO-2-BUTENE	µg/L	25	--	--	--	--	--	--
TRICHLOROETHYLENE (TCE)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRICHLOROFLUOROMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 R	0.5 U	0.5 U	0.5 U
VINYL ACETATE	µg/L	2	2 U	2 U	2 U	2 U	2 U	2 U
VINYL CHLORIDE	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Notes:
FD - Field duplicate
N - Original sample
-- - Not anaylzed

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Appendix D
Analytical Results from 1999 Southern Lobe TCE Plume Delineation
NAS Fort Worth JRB

Analytical Method/Analyte	UNITS	Reporting Limit	WHGLTA025		
			N	N	N
			7/8/99	9/14/99	11/5/99
1,1,1,2-TETRACHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U
1,1,1-TRICHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U
1,1,2,2-TETRACHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U
1,1,2-TRICHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U
1,1-DICHLOROETHANE	µg/L	0.4	0.4 U	0.4 U	0.4 U
1,1-DICHLOROETHENE	µg/L	0.5	0.5 U	0.5 U	0.5 U
1,1-DICHLOROPROPENE	µg/L	0.5	0.5 U	0.5 U	0.5 U
1,2,3-TRICHLOROBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U
1,2,3-TRICHLOROPROPANE	µg/L	0.5	0.5 U	0.5 U	0.5 U
1,2,4-TRICHLOROBENZENE	µg/L	0.4	0.4 U	0.4 U	0.4 U
1,2,4-TRIMETHYLBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U
1,2-DIBROMO-3-CHLOROPROPANE	µg/L	0.5	0.5 U	0.5 U	0.5 U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	µg/L	0.5	0.5 U	0.5 U	0.5 U
1,2-DICHLOROBENZENE	µg/L	0.3	0.3 U	0.3 U	0.3 U
1,2-DICHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U
1,2-DICHLOROPROPANE	µg/L	0.4	0.4 U	0.4 U	0.4 U
1,3,5-TRIMETHYLBENZENE (MESITYLENE)	µg/L	0.5	0.5 U	0.5 U	0.5 U
1,3-DICHLOROBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U
1,3-DICHLOROPROPANE	µg/L	0.4	0.4 U	0.4 U	0.4 U
1,4-DICHLOROBENZENE	µg/L	0.3	0.3 U	0.3 U	0.3 U
1-CHLOROHEXANE	µg/L	0.5	0.5 U	0.5 U	0.5 U
2,2-DICHLOROPROPANE	µg/L	0.5	0.5 U	0.5 U	0.5 U
2-CHLORO-1,3-BUTADIENE	µg/L	10	--	--	--
2-CHLOROTOLUENE	µg/L	0.4	0.4 U	0.4 U	0.4 U
2-HEXANONE	µg/L	20	--	--	--
4-CHLOROTOLUENE	µg/L	0.5	0.5 U	0.5 U	0.5 U
ACETONE	µg/L	20	--	--	--
ACETONITRILE	µg/L	100	--	--	--
ACROLEIN	µg/L	100	--	--	--
ACRYLONITRILE	µg/L	100	--	--	--
ALLYL CHLORIDE (3-CHLOROPROPENE)	µg/L	10	--	--	--
BENZENE	µg/L	0.4	0.4 U	0.4 U	0.4 U
BROMOBENZENE	µg/L	0.3	0.3 U	0.3 U	0.3 U
BROMOCHLOROMETHANE	µg/L	0.4	0.4 U	0.4 U	0.4 U
BROMODICHLOROMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U
BROMOFORM	µg/L	0.5	0.5 U	0.5 U	0.5 U
BROMOMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U
CARBON DISULFIDE	µg/L	5	--	--	--
CARBON TETRACHLORIDE	µg/L	0.5	0.5 U	0.5 U	0.5 U

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Appendix D
Analytical Results from 1999 Southern Lobe TCE Plume Delineation
NAS Fort Worth JRB

Analytical Method/Analyte	UNITS	Reporting Limit	WHGLTA025		
			N	N	N
			7/8/99	9/14/99	11/5/99
CHLOROBENZENE	µg/L	0.4	0.4 U	0.4 U	0.4 U
CHLOROETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U
CHLOROFORM	µg/L	0.3	0.3 U	0.3 U	0.3 U
CHLOROMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U
CIS-1,2-DICHLOROETHYLENE	µg/L	0.5	0.8	2	2
CIS-1,3-DICHLOROPROPENE	µg/L	0.5	0.5 U	0.5 U	0.5 U
DIBROMOCHLOROMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U
DIBROMOMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U
DICHLORODIFLUOROMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 U
ETHYL METHACRYLATE	µg/L	5	--	--	--
ETHYLBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U
HEXACHLOROBUTADIENE	µg/L	0.5	0.5 U	0.5 U	0.5 U
IODOMETHANE (METHYL IODIDE)	µg/L	5	--	--	--
ISOBUTANOL	µg/L	200	--	--	--
ISOPROPYLBENZENE (CUMENE)	µg/L	0.5	0.5 U	0.5 U	0.5 U
M,P-XYLENE (SUM OF ISOMERS)	µg/L	0.5	0.5 U	0.5 U	0.5 U
METHYL ETHYL KETONE (2-BUTANONE)	µg/L	20	--	--	--
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	µg/L	20	--	--	--
METHYL METHACRYLATE	µg/L	5	--	--	--
METHYLACRYLONITRILE	µg/L	100	--	--	--
METHYLENE CHLORIDE	µg/L	0.5	0.5 U	0.5 U	0.5 R
NAPHTHALENE	µg/L	0.5	1 UJ	0.5 U	0.5 U
N-BUTYLBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U
N-PROPYLBENZENE	µg/L	0.4	0.4 U	0.4 U	0.4 U
O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L	0.5	0.5 U	0.5 U	0.5 U
P-CYMENE (P-ISOPROPYLTOLUENE)	µg/L	0.5	0.5 U	0.5 U	0.5 U
PROPANE NITRILE (PROPIONITRILE)	µg/L	100	--	--	--
SEC-BUTYLBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U
STYRENE	µg/L	0.4	0.4 U	0.4 U	0.4 U
T-BUTYLBENZENE	µg/L	0.5	0.5 U	0.5 U	0.5 U
TETRACHLOROETHYLENE(PCE)	µg/L	0.5	0.5 U	0.5 U	0.5 U
TOLUENE	µg/L	0.5	0.5 U	0.5 U	0.5 U
TRANS-1,2-DICHLOROETHENE	µg/L	0.5	0.5 U	0.5 U	0.5 U
TRANS-1,3-DICHLOROPROPENE	µg/L	0.5	0.5 U	0.5 U	0.5 U
TRANS-1,4-DICHLORO-2-BUTENE	µg/L	25	--	--	--
TRICHLOROETHYLENE (TCE)	µg/L	0.5	4	6	9
TRICHLOROFLUOROMETHANE	µg/L	0.5	0.5 U	0.5 U	0.5 R
VINYL ACETATE	µg/L	2	2 U	2 U	2 U
VINYL CHLORIDE	µg/L	0.5	0.5 U	0.5 U	0.5 U

Notes:
FO - Field duplicate
N - Original sample
-- - Not anaylzed

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TAB

Appendix E

APPENDIX E

ANALYTICAL RESULTS from 1999 RECOVERY WELL SAMPLING

Appendix E
Analytical Results from 1999 Recovery Well Sampling
NAS Fort Worth JRB

Analytical Method/Analysis	UNITS	Reporting Limit	CAR-RW01			CAR-RW02		CAR-RW04	
			N	N	FD	N	N	N	N
			9/17/99*	11/5/99*	11/5/99*	9/16/99	11/5/99*	9/17/99*	11/5/99*
1,1,1,2-TETRACHLOROETHANE	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
1,1,1-TRICHLOROETHANE	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
1,1,2,2-TETRACHLOROETHANE	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
1,1,2-TRICHLOROETHANE	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
1,1-DICHLOROETHANE	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
1,1-DICHLOROETHENE	µg/L	1	4	240 U	240 U	4 J	240 U	3	240 U
1,1-DICHLOROPROPENE	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
1,2,3-TRICHLOROBENZENE	µg/L	2	2 U	400 U	400 U	2 U	400 U	2 U	400 U
1,2,3-TRICHLOROPROPANE	µg/L	3	3 U	640 U	640 U	3 U	640 U	3 U	640 U
1,2,4-TRICHLOROBENZENE	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
1,2,4-TRIMETHYLBENZENE	µg/L	1	1 U	260 U	260 U	1 U	260 U	1 U	260 U
1,2-DIBROMO-3-CHLOROPROPANE	µg/L	3	3 U	520 U	520 U	3 U	520 U	3 U	520 U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
1,2-DICHLOROBENZENE	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
1,2-DICHLOROETHANE	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
1,2-DICHLOROPROPANE	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
1,3,5-TRIMETHYLBENZENE (MESITYLENE)	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
1,3-DICHLOROBENZENE	µg/L	1	1 U	240 U	240 U	1 U	240 U	1 U	240 U
1,3-DICHLOROPROPANE	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
1,4-DICHLOROBENZENE	µg/L	1	1 U	200 U	200 U	1	200 U	0.8 F	200 U
1-CHLOROHEXANE	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
2,2-DICHLOROPROPANE	µg/L	4	4 U	700 U	700 U	4 U	700 U	4 U	700 U
2-CHLOROTOLUENE	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
4-CHLOROTOLUENE	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
BENZENE	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
BROMOBENZENE	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
BROMOCHLOROMETHANE	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
BROMODICHLOROMETHANE	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
BROMOFORM	µg/L	1	1 U	240 U	240 U	1 U	240 U	1 U	240 U
BROMOMETHANE	µg/L	1	1 U	220 U	220 U	1 U	220 U	1 U	220 U
CARBON TETRACHLORIDE	µg/L	2	2 U	420 U	420 U	2 U	420 U	2 U	420 U

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524 397

Appendix E
Analytical Results from 1999 Recovery Well Sampling
NAS Fort Worth JRB

Analytical Method/Analysis	UNITS	Reporting Limit	CAR-RW01			CAR-RW02		CAR-RW04	
			N	N	FD	N	N	N	N
			9/17/99*	11/5/99*	11/5/99*	9/16/99	11/5/99*	9/17/99*	11/5/99*
CHLOROBENZENE	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
CHLOROETHANE	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
CHLOROFORM	µg/L	1	1 U	200 U	200 U	1 U	200 U	0.8 F	200 U
CHLOROMETHANE	µg/L	1	1 U	260 U	260 U	1 U	260 U	1 U	260 U
CIS-1,2-DICHLOROETHYLENE	µg/L	1	590	740	560	350	490	330	650
CIS-1,3-DICHLOROPROPENE	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
DIBROMOCHLOROMETHANE	µg/L	1	1 U	200 U	200 U	5	200 U	1 U	200 U
DIBROMOMETHANE	µg/L	2	2 U	480 U	480 U	2 U	480 U	2 U	480 U
DICHLORODIFLUOROMETHANE	µg/L	1	1 U	200 U	200 U	0.8 F	200 U	1 U	200 U
ETHYLBENZENE	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
HEXACHLOROBUTADIENE	µg/L	1	1 U	220 U	220 U	1 U	220 U	1 U	220 U
ISOPROPYLBENZENE (CUMENE)	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
M,P-XYLENE (SUM OF ISOMERS)	µg/L	1	1 U	260 U	260 U	1 U	260 U	1 U	260 U
METHYLENE CHLORIDE	µg/L	1	1 U	200 U	200 U	1 R	200 U	1 U	200 U
NAPHTHALENE	µg/L	2	2 U	400 U	400 U	2 U	400 U	2 U	400 U
N-BUTYLBENZENE	µg/L	1	1 U	220 U	220 U	1 U	220 U	1 U	220 U
N-PROPYLBENZENE	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L	1	1 U	220 U	220 U	1 U	220 U	1 U	220 U
P-CYMENE (P-ISOPROPYLTOLUENE)	µg/L	1	1 U	240 U	240 U	1 U	240 U	1 U	240 U
SEC-BUTYLBENZENE	µg/L	1	1 U	260 U	260 U	1 U	260 U	1 U	260 U
STYRENE	µg/L	1	1 U	200 U	200 U	1 UJ	200 U	1 U	200 U
T-BUTYLBENZENE	µg/L	1	1 U	280 U	280 U	1 U	280 U	1 U	280 U
TETRACHLOROETHYLENE(PCE)	µg/L	1	0.7 F	280 U	280 U	3	280 U	7	280 U
TOLUENE	µg/L	1	1 U	220 U	220 U	1 U	220 U	1 U	220 U
TRANS-1,2-DICHLOROETHENE	µg/L	1	100 U	200 U	62 F	63 J	200 U	100 U	200 U
TRANS-1,3-DICHLOROPROPENE	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
TRICHLOROETHYLENE (TCE)	µg/L	1	3100	3100	3400	2800	3000	2900	3400
TRICHLOROFLUOROMETHANE	µg/L	1	1 U	200 U	200 U	1 U	200 U	1 U	200 U
VINYL CHLORIDE	µg/L	1	14	220 U	220 U	20 J	220 U	4	220 U

Appendix E
Analytical Results from 1999 Recovery Well Sampling
NAS Fort Worth JRB

Analytical Method/Analysis	UNITS	Reporting Limit	CAR-RW05		CAR-RW06		CAR-RW08	
			N	N	N	N	N	N
			9/16/99	11/5/99*	9/17/99*	11/5/99*	9/16/99	11/5/99*
1,1,1,2-TETRACHLOROETHANE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
1,1,1-TRICHLOROETHANE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
1,1,2,2-TETRACHLOROETHANE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
1,1,2-TRICHLOROETHANE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
1,1-DICHLOROETHANE	µg/L	1	0.7 F	200 U	0.8 F	200 U	0.8 F	200 U
1,1-DICHLOROETHENE	µg/L	1	5 J	240 U	3	240 U	4 J	240 U
1,1-DICHLOROPROPENE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
1,2,3-TRICHLOROBENZENE	µg/L	2	2 U	400 U	2 U	400 U	2 U	400 U
1,2,3-TRICHLOROPROPANE	µg/L	3	3 U	640 U	3 U	640 U	3 U	640 U
1,2,4-TRICHLOROBENZENE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
1,2,4-TRIMETHYLBENZENE	µg/L	1	1 U	260 U	1 U	260 U	1 U	260 U
1,2-DIBROMO-3-CHLOROPROPANE	µg/L	3	3 U	520 U	3 U	520 U	3 U	520 U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
1,2-DICHLOROBENZENE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
1,2-DICHLOROETHANE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
1,2-DICHLOROPROPANE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
1,3,5-TRIMETHYLBENZENE (MESITYLENE)	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
1,3-DICHLOROBENZENE	µg/L	1	2 U	240 U	1 U	240 U	1 U	240 U
1,3-DICHLOROPROPANE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
1,4-DICHLOROBENZENE	µg/L	1	1 U	200 U	1 U	200 U	0.8 F	200 U
1-CHLOROHEXANE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
2,2-DICHLOROPROPANE	µg/L	4	4 U	700 U	4 U	700 U	4 U	700 U
2-CHLOROTOLUENE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
4-CHLOROTOLUENE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
BENZENE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
BROMOBENZENE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
BROMOCHLOROMETHANE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
BROMODICHLOROMETHANE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
BROMOFORM	µg/L	1	1 U	240 U	1 U	240 U	1 U	240 U
BROMOMETHANE	µg/L	1	1 U	220 U	1 U	220 U	1 U	220 U
CARBON TETRACHLORIDE	µg/L	2	2 U	420 U	2 U	420 U	2 U	420 U

Appendix E
Analytical Results from 1999 Recovery Well Sampling
NAS Fort Worth JRB

Analytical Method/Analysis	UNITS	Reporting Limit	CAR-RW05		CAR-RW06		CAR-RW08	
			N	N	N	N	N	N
			9/16/99	11/5/99*	9/17/99*	11/5/99*	9/16/99	11/5/99*
CHLOROBENZENE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
CHLOROETHANE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
CHLOROFORM	µg/L	1	1 U	200 U	0.8 F	200 U	1 U	200 U
CHLOROMETHANE	µg/L	1	1 U	260 U	1 U	260 U	1 U	260 U
CIS-1,2-DICHLOROETHYLENE	µg/L	1	240	330	390	760	380	610
CIS-1,3-DICHLOROPROPENE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
DIBROMOCHLOROMETHANE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
DIBROMOMETHANE	µg/L	2	2 U	480 U	2 U	480 U	2 U	480 U
DICHLORODIFLUOROMETHANE	µg/L	1	1 J	200 U	1 U	200 U	1 U	200 U
ETHYLBENZENE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
HEXACHLOROBUTADIENE	µg/L	1	1 U	220 U	1 U	220 U	1 U	220 U
ISOPROPYLBENZENE (CUMENE)	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
M,P-XYLENE (SUM OF ISOMERS)	µg/L	1	1 U	260 U	1 U	260 U	1 U	260 U
METHYLENE CHLORIDE	µg/L	1	1 R	200 U	1 U	200 U	1 R	200 U
NAPHTHALENE	µg/L	2	2 U	400 U	2 U	400 U	2 U	400 U
N-BUTYLBENZENE	µg/L	1	1 U	220 U	1 U	220 U	1 U	220 U
N-PROPYLBENZENE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L	1	1 U	220 U	1 U	220 U	1 U	220 U
P-CYMENE (P-ISOPROPYLTOLUENE)	µg/L	1	1 U	240 U	1 U	240 U	1 U	240 U
SEC-BUTYLBENZENE	µg/L	1	1 U	260 U	1 U	260 U	1 U	260 U
STYRENE	µg/L	1	1 UJ	200 U	1 U	200 U	1 UJ	200 U
T-BUTYLBENZENE	µg/L	1	1 U	280 U	1 U	280 U	1 U	280 U
TETRACHLOROETHYLENE(PCE)	µg/L	1	1 U	280 U	4	280 U	14	280 U
TOLUENE	µg/L	1	1 U	220 U	1 U	220 U	1 U	220 U
TRANS-1,2-DICHLOROETHENE	µg/L	1	85 J	200 U	100 U	200 U	54 J	200 U
TRANS-1,3-DICHLOROPROPENE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
TRICHLOROETHYLENE (TCE)	µg/L	1	1400	1500	2900	3400	3800	4600
TRICHLOROFLUOROMETHANE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
VINYL CHLORIDE	µg/L	1	36 J	220 U	10	220 U	21 J	220 U

Appendix E
Analytical Results from 1999 Recovery Well Sampling
NAS Fort Worth JRB

Analytical Method/Analysis	UNITS	Reporting Limit	CAR-RW09		CAR-RW010		CAR-RW011	
			N	N	N	N	N	N
			9/17/99*	11/5/99*	9/16/99	11/5/99*	9/16/99	11/5/99*
1,1,1,2-TETRACHLOROETHANE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
1,1,1-TRICHLOROETHANE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
1,1,2,2-TETRACHLOROETHANE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
1,1,2-TRICHLOROETHANE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
1,1-DICHLOROETHANE	µg/L	1	1 U	200 U	0.9 F	200 U	0.7 F	200 U
1,1-DICHLOROETHENE	µg/L	1	3	240 U	4 J	240 U	3 J	240 U
1,1-DICHLOROPROPENE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
1,2,3-TRICHLOROBENZENE	µg/L	2	2 U	400 U	2 U	400 U	2 U	400 U
1,2,3-TRICHLOROPROPANE	µg/L	3	3 U	640 U	3 U	640 U	3 U	640 U
1,2,4-TRICHLOROBENZENE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
1,2,4-TRIMETHYLBENZENE	µg/L	1	1 U	260 U	1 U	260 U	1 U	260 U
1,2-DIBROMO-3-CHLOROPROPANE	µg/L	3	3 U	520 U	3 U	520 U	3 U	520 U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
1,2-DICHLOROBENZENE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
1,2-DICHLOROETHANE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
1,2-DICHLOROPROPANE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
1,3,5-TRIMETHYLBENZENE (MESITYLENE)	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
1,3-DICHLOROBENZENE	µg/L	1	1 U	240 U	1 U	240 U	1 U	240 U
1,3-DICHLOROPROPANE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
1,4-DICHLOROBENZENE	µg/L	1	1 U	200 U	1 U	200 U	1	200 U
1-CHLOROHEXANE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
2,2-DICHLOROPROPANE	µg/L	4	4 U	700 U	4 U	700 U	4 U	700 U
2-CHLOROTOLUENE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
4-CHLOROTOLUENE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
BENZENE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
BROMOBENZENE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
BROMOCHLOROMETHANE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
BROMODICHLOROMETHANE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
BROMOFORM	µg/L	1	1 U	240 U	1 U	240 U	1 U	240 U
BROMOMETHANE	µg/L	1	1 U	220 U	1 U	220 U	1 U	220 U
CARBON TETRACHLORIDE	µg/L	2	2 U	420 U	2 U	420 U	2 U	420 U

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Analytical Results from 1999 Recovery Well Sampling
NAS Fort Worth JRB

Analytical Method/Analysis	UNITS	Reporting Limit	CAR-RW09		CAR-RW010		CAR-RW011	
			N	N	N	N	N	N
			9/17/99*	11/5/99*	9/16/99	11/5/99*	9/16/99	11/5/99*
CHLOROBENZENE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
CHLOROETHANE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
CHLOROFORM	µg/L	1	0.8 F	200 U	1 U	200 U	0.9 F	200 U
CHLOROMETHANE	µg/L	1	1 U	260 U	1 U	260 U	1 U	260 U
CIS-1,2-DICHLOROETHYLENE	µg/L	1	330	490	350 J	440	320	580
CIS-1,3-DICHLOROPROPENE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
DIBROMOCHLOROMETHANE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
DIBROMOMETHANE	µg/L	2	2 U	480 U	2 U	480 U	2 U	480 U
DICHLORODIFLUOROMETHANE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
ETHYLBENZENE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
HEXACHLOROBUTADIENE	µg/L	1	1 U	220 U	1 U	220 U	1 U	220 U
ISOPROPYLBENZENE (CUMENE)	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
M,P-XYLENE (SUM OF ISOMERS)	µg/L	1	1 U	260 U	1 U	260 U	1 U	260 U
METHYLENE CHLORIDE	µg/L	1	1 U	200 U	1 R	200 U	1 R	200 U
NAPHTHALENE	µg/L	2	2 U	400 U	2 U	400 U	2 U	400 U
N-BUTYLBENZENE	µg/L	1	1 U	220 U	1 U	220 U	1 U	220 U
N-PROPYLBENZENE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L	1	1 U	220 U	1 U	220 U	1 U	220 U
P-CYMENE (P-ISOPROPYLTOLUENE)	µg/L	1	1 U	240 U	1 U	240 U	1 U	240 U
SEC-BUTYLBENZENE	µg/L	1	1 U	260 U	1 U	260 U	1 U	260 U
STYRENE	µg/L	1	1 U	200 U	1 UJ	200 U	1 UJ	200 U
T-BUTYLBENZENE	µg/L	1	1 U	280 U	1 U	280 U	1 U	280 U
TETRACHLOROETHYLENE(PCE)	µg/L	1	6	280 U	0.8 F	280 U	13	280 U
TOLUENE	µg/L	1	1 U	220 U	1 U	220 U	1 U	220 U
TRANS-1,2-DICHLOROETHENE	µg/L	1	39	200 U	66 J	200 U	49 J	200 U
TRANS-1,3-DICHLOROPROPENE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
TRICHLOROETHYLENE (TCE)	µg/L	1	3200	3300	3100	3200	2500	3000
TRICHLOROFLUOROMETHANE	µg/L	1	1 U	200 U	1 U	200 U	1 U	200 U
VINYL CHLORIDE	µg/L	1	5	220 U	27 J	220 U	31 J	220 U

Appendix E
Analytical Results from 1999 Recovery Well Sampling
NAS Fort Worth JRB

Analytical Method/Analysis	UNITS	Reporting Limit	CAR-RW012		LF04-03	
			N	N	N	N
			9/16/99	11/5/99*	9/16/99	11/5/99*
1,1,1,2-TETRACHLOROETHANE	µg/L	1	1 U	200 U	1 U	200 U
1,1,1-TRICHLOROETHANE	µg/L	1	1 U	200 U	1 U	200 U
1,1,2,2-TETRACHLOROETHANE	µg/L	1	1 U	200 U	1 U	200 U
1,1,2-TRICHLOROETHANE	µg/L	1	1 U	200 U	1 U	200 U
1,1-DICHLOROETHANE	µg/L	1	0.9 F	200 U	0.8 F	200 U
1,1-DICHLOROETHENE	µg/L	1	4 J	240 U	4 J	240 U
1,1-DICHLOROPROPENE	µg/L	1	1 U	200 U	1 U	200 U
1,2,3-TRICHLOROBENZENE	µg/L	2	2 U	400 U	2 U	400 U
1,2,3-TRICHLOROPROPANE	µg/L	3	3 U	640 U	3 U	640 U
1,2,4-TRICHLOROBENZENE	µg/L	1	1 U	200 U	1 U	200 U
1,2,4-TRIMETHYLBENZENE	µg/L	1	1 U	260 U	1 U	260 U
1,2-DIBROMO-3-CHLOROPROPANE	µg/L	3	3 U	520 U	3 U	520 U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	µg/L	1	1 U	200 U	1 U	200 U
1,2-DICHLOROBENZENE	µg/L	1	1 U	200 U	1 U	200 U
1,2-DICHLOROETHANE	µg/L	1	1 U	200 U	1 U	200 U
1,2-DICHLOROPROPANE	µg/L	1	1 U	200 U	1 U	200 U
1,3,5-TRIMETHYLBENZENE (MESITYLENE)	µg/L	1	1 U	200 U	1 U	200 U
1,3-DICHLOROBENZENE	µg/L	1	1	240 U	1 U	240 U
1,3-DICHLOROPROPANE	µg/L	1	1 U	200 U	1 U	200 U
1,4-DICHLOROBENZENE	µg/L	1	1 U	200 U	1 U	200 U
1-CHLOROHEXANE	µg/L	1	1 U	200 U	1 U	200 U
2,2-DICHLOROPROPANE	µg/L	4	4 U	700 U	4 U	700 U
2-CHLOROTOLUENE	µg/L	1	1 U	200 U	1 U	200 U
4-CHLOROTOLUENE	µg/L	1	1 U	200 U	1 U	200 U
BENZENE	µg/L	1	1 U	200 U	1 U	200 U
BROMOBENZENE	µg/L	1	1 U	200 U	1 U	200 U
BROMOCHLOROMETHANE	µg/L	1	1 U	200 U	1 U	200 U
BROMODICHLOROMETHANE	µg/L	1	1 U	200 U	1 U	200 U
BROMOFORM	µg/L	1	1 U	240 U	1 U	240 U
BROMOMETHANE	µg/L	1	1 U	220 U	1 U	220 U
CARBON TETRACHLORIDE	µg/L	2	2 U	420 U	2 U	420 U

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Appendix E
Analytical Results from 1999 Recovery Well Sampling
NAS Fort Worth JRB

Analytical Method/Analysis	UNITS	Reporting Limit	CAR-RW012		LF04-03	
			N	N	N	N
			9/16/99	11/5/99*	9/16/99	11/5/99*
CHLOROBENZENE	µg/L	1	0.7 F	200 U	1 U	200 U
CHLOROETHANE	µg/L	1	1 U	200 U	1 U	200 U
CHLOROFORM	µg/L	1	1 U	200 U	0.8 F	200 U
CHLOROMETHANE	µg/L	1	1 U	260 U	1 U	260 U
CIS-1,2-DICHLOROETHYLENE	µg/L	1	510	860	370	750
CIS-1,3-DICHLOROPROPENE	µg/L	1	1 U	200 U	1 U	200 U
DIBROMOCHLOROMETHANE	µg/L	1	1 U	200 U	1 U	200 U
DIBROMOMETHANE	µg/L	2	2 U	480 U	2 U	480 U
DICHLORODIFLUOROMETHANE	µg/L	1	1 U	200 U	1 U	200 U
ETHYLBENZENE	µg/L	1	1 U	200 U	1 U	200 U
HEXACHLOROBUTADIENE	µg/L	1	1 U	220 U	1 U	220 U
ISOPROPYLBENZENE (CUMENE)	µg/L	1	1 U	200 U	1 U	200 U
M,P-XYLENE (SUM OF ISOMERS)	µg/L	1	1 U	260 U	1 U	260 U
METHYLENE CHLORIDE	µg/L	1	1 R	200 U	1 R	200 U
NAPHTHALENE	µg/L	2	2 U	400 U	2 U	400 U
N-BUTYLBENZENE	µg/L	1	1 U	220 U	1 U	220 U
N-PROPYLBENZENE	µg/L	1	1 U	200 U	1 U	200 U
O-XYLENE (1,2-DIMETHYLBENZENE)	µg/L	1	1 U	220 U	1 U	220 U
P-CYMENE (P-ISOPROPYLTOLUENE)	µg/L	1	1 U	240 U	1 U	240 U
SEC-BUTYLBENZENE	µg/L	1	1 U	260 U	1 U	260 U
STYRENE	µg/L	1	1 UJ	200 U	1 UJ	200 U
T-BUTYLBENZENE	µg/L	1	1 U	280 U	1 U	280 U
TETRACHLOROETHYLENE(PCE)	µg/L	1	0.9 F	280 U	2	280 U
TOLUENE	µg/L	1	1 U	220 U	1 U	220 U
TRANS-1,2-DICHLOROETHENE	µg/L	1	65 J	66 F	53 J	66 F
TRANS-1,3-DICHLOROPROPENE	µg/L	1	1 U	200 U	1 U	200 U
TRICHLOROETHYLENE (TCE)	µg/L	1	3100	3500	2700	3100
TRICHLOROFLUOROMETHANE	µg/L	1	1 U	200 U	1 U	200 U
VINYL CHLORIDE	µg/L	1	18 J	220 U	13 J	220 U

Notes:
N - Original sample
FD - Field duplicate
* This data is unvalidated, however qualifiers were based on a review of laboratory qualifiers.

FINAL PAGE

ADMINISTRATIVE RECORD

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