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FINAL PHASE 3 WORK PLANS ADDENDUM RCRA FACILITY INVESTIGATION FOR SOLID WASTE MANAGEMENT UNITS 17, 26, 28, 29, 30 AND 62 NAS FORT WORTH TX
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HYDROGEOLOGIC

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NAVAL AIR STATION
FORT WORTH JRB
CARSWELL FIELD
TEXAS

ADMINISTRATIVE RECORD
COVER SHEET

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HYDRO GeoLogic INC.

FINAL PHASE III WORK PLANS ADDENDUM RCRA FACILITY INVESTIGATION OF SWMUS 17, 26, 28, 29, 30, AND 62 NAS FORT WORTH JRB, TEXAS

Prepared for

U.S. Air Force Center for Environmental Excellence
Brooks AFB, Texas
Contract Number F41624-95-D-8005

January 2001

HydroGeoLogic, Inc.
1155 Herndon Parkway
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663 2 4-059

HYDRO GeoLogic INC

Federal Express

January 19, 2001

Mr. Don Ficklen
HQ AFCEE/ERD
3207 North Road
Brooks AFB, Texas 78235-5363

Re: Final RCRA Facility Investigation Phase III Work Plan Addendum for SWMUs 17, 26, 28, 29, 30, and 62, NAS Fort Worth JRB, Texas AFCEE Contract No. F41624-95-D-8005, Delivery Order 33

Dear Mr. Ficklen

Enclosed is one copy of the Final RCRA Facility Investigation Phase III Work Plans Addendum (WPA) for SWMU Nos. 17 (Landfill 7), 26 (Landfill 3), 28 (Landfill 1), 29 (Landfill 2), 30 (Landfill 9), and 62 (Landfill 6), NAS Fort Worth JRB, Texas. The field investigation strategies and tasks proposed within this document are consistent with those presented by HydroGeoLogic to AFCEE during the September 2000 Program Review in Herndon, Virginia, as well as presented to the Texas Natural Resource Conservation Commission at the November 2, 2000 Remedial Project Manager's Meeting held in Fort Worth, Texas. Responses to Air Force Comments have been incorporated in the WPA and included as an attachment along with the Responses to Comments on SWMU 28 by Ray Risner (TNRCC)

Field work to implement the Work Plan Addendum is scheduled to begin on January 22, 2001 and be completed on February 16, 2001.

If you have any questions or comments regarding this submission, please call me at (512) 336-1170, extension 29, or Bob Wallace at (703) 736-4565 or (817)-737-9377.

Sincerely,

Robert Wallace for

Todd C. Harrah
Project Manager

Enclosures

cc: Mr. Michael Dodyk, AFCEE/ERD (1 copy)
Ms. Audrie Medina, UNITEC (1 copy)

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RESPONSES TO COMMENTS: DRAFT PHASE III WORK PLANS ADDENDUM RCRA FACILITY INVESTIGATION OF SWMUs 17, 26, 28, 29, 30, AND 62 NAS FORT WORTH JRB, TEXAS NOVEMBER 2000

Responses to Comments

Comment 1 Page 3-1, *Section 3.1.2, Sentence 4: The text states "At B701/B718, confirmation/SPLP results showed that chromium was not confirmed, lead and cadmium were confirmed and failed SPLP, and PAHs were confirmed at lesser concentration that passed SPLP." However, based on data on Figure 3.1, it appears that cadmium was also not confirmed. Please clarify.*

Response **The sentence has been revised to state, "At B701/B718, confirmation/SPLP results showed that chromium was not confirmed, cadmium and PAHS were confirmed at lesser concentrations that passed SPLP; and lead was confirmed at a lesser concentration that failed SPLP."**

Comment 2 *Page 3-2, Section 3.1.3, Second paragraph, last sentence: Please indicate the MSC value provided based on the SPLP analysis.*

Response **The sentence has been revised to state, "It should also be noted that the lead detection at B723B passed SPLP and provides the current site-specific MSC of 73.1 mg/kg at SWMU 17."**

Comment 3 *Page 3-2, Section 3.1.4,* Sentence 1: *The text states "As depicted in Figure 3.2, analytical results from the first three rounds of groundwater sampling reveal Standard 2 and 3 detections of chlorinated solvents associated with the regional trichloroethene (TCE) plume (Figure 1.1)." However, in Figure 3.2 Standard detections are not included in the figure. Please clarify.*

Response **Standard 2 and 3 detections are presented on the map as RRS-2 and RRS-3; Concentrations greater than RRS-1 and less than or equal to RRS-2 are Standard 2; concentrations greater than RRS-2 (yellow highlight) are Standard 3 . Standard 1 concentrations (concentrations $\leq$ RRS-1) are not presented. Definition: Standard 1 $\leq$ RRS-1 (Specific Value) < Standard 2 $\leq$ RRS-2 (Specific Value) < Standard 3. In other**

words, Standard 1 refers to all concentrations less than or equal to the specific value of RRS-1. Standard 2 refers to all concentrations above the RRS-1 value and less than or equal to the specific value of RRS-2. Standard 3 refers to all concentrations greater than RRS-2. An additional note has been added to the figure to clarify the relationship of the presented concentrations. It states, "All groundwater analytical concentrations presented on figure are greater than RRS-1. Yellow highlighting indicates concentrations greater than RRS-2."

Comment 4 *Page 3-3, Section 3.1.4, Sentence 3: Please refer to comments in item 2.*

Response RRS-1 and RRS-2 values are presented on Figure 3.2. The reference "Standard 2 concentrations of arsenic" refers to all groundwater concentrations greater than the RRS-1 of 0.0049 mg/L for arsenic. The sentence has been revised to state, "Note that arsenic was detected at Standard 2 concentrations (>0.0049 mg/L) in all three downgradient monitoring wells in the December 1998 sampling event."

Comment 5 *Figure 3.3: Proposed well locations and existing well locations are indicated on the figure as the same symbol. Please revise.*

Response The figure has been revised as requested.

Comment 6 *Page 3-3, Section 3.1.5, Sentence 2: In the text description, it is indicated that 4 soil borings (B735, B739, B745, and B751) were installed and sampled. However, the borings are not included in Figure 3.3. It is recommended that they be included in the figure.*

Response The 4 borings are actually piezometer/soil borings (P735, P739, P745, and P751). The locations are on the figure but were mislabeled in the text as (B73X). The text has been revised to state "...4 piezometers/soil borings (P735, P739, P745, and P751) were installed and sampled during the ESC."

Comment 7 *Page 3-3, Section 3.1.5, First paragraph, last sentence: The text indicates that "the benzene plume is not completely delineated to the west-southwest in groundwater", however, there is no recommendations for delineating the benzene plume. It is recommended that a suggestion regarding delineation.*

Response **As requested, a sentence has been added to the end of paragraph stating, "Further delineation of benzene-impacted groundwater to the west-southwest is recommended."**

Comment 8 *Page 3-3, Section 3.1.5, Second paragraph, third sentence: The text indicates that "No source area for benzene was encountered in soil samples collected within SWMU 17." However, there is no basis for the statement. It is recommended that the Contractor indicate whether the statement is based on lack of waste encountered or low concentrations, etc.*

Response **The sentence has been revised to state, "A total of 22 soil samples collected from 8 soil borings (B701, B702, B703, B704, B735, B739, B745, and B751) were analyzed for VOCs during the RFI of SWMU 17. Results from these analyses show that benzene was not encountered in any soil samples collected above the water table within SWMU 17. A definitive source of benzene-impacted groundwater at SWMU 17 has not yet been determined."**

Comment 9 *Page 3-7, Section 3.3.4, Sentence nine: Please insert "West Fork" before "Trinity River".*

Response **The text has been revised as requested.**

Comment 10 *Figure 3.3: It is recommended that a well be proposed to delineate the benzene detection at PHGLTA743.*

Response **Proposed monitoring well WHGLTA709 has been added to Figure 3.3 to delineate benzene to the west-southwest of PHGLTA743.**

Comment 11 *Figure 3.5: Analytes detected above medium-specific concentration (MSC) in soil and in SPLP extract are included in the legend; however, they are not included in the figure. Please revise.*

Response **Yellow highlighting has been added to compounds in sample intervals that failed SPLP in Figure 3.4, specifically lead detected in the 15-foot intervals of B304 and B324.**

Comment 12 *Figure 3.7: Round III analyses or results (header) and analyte detected above MSC in soil and in SPLP extract are included in the legend, but they are not included in the map (Figure 3-7). Please revise.*

Response **The references to "Round III analyses or results (header) and Analytes detected above medium-specific concentration (MSC) in soil and in SPLP extract" have been deleted from the legend in Figure 3.7.**

Comment 13 *Page 3-7, Section 3.3.4, Sentence 2: The text states "Proposed Phase III sampling locations are depicted on 3.7 with tan colored headers." Please insert the word "Figure" between the word "on" and "3.7".*

Response **The text has been revised as requested.**

Comment 14 *Page 3-7, Section 3.3.4, Sentence nine: Please insert "West Fork" before "Trinity River".*

Response **The text has been revised as requested.**

Comment 15 *Figure 3.9: Analytes detected above MSC in soil and in SPLP extract are included in the legend; however, they are not included in the figure. Please revise.*

Response **The reference to "Analytes detected above medium-specific concentration (MSC) in soil and in SPLP extract" has been deleted from the legend in Figure 3.9.**

Comment 16 *Page 3-11, Section 3.4.6, Sentences 5 and 6: The boring numbers in the text description are different from the boring numbers in Figure 3-12. For consistency, please use the same numbering for the borings presented in the text and in the figure.*

Response **An additional "0" has been added to the referenced boring numbers in the text to be consistent with the figure. For example: BHGLSWMU3104 has been changed to BHGLSWMU31004.**

Comment 17 *Page 3-11, Section 3.4.6, Sentence 7: The text states "SPLP extractions and analyses were performed on barium, cadmium, chromium, lead, and mercury at BHGLSWMU3101." However, the results of these analyses are not shown in Figure 3.12. It is recommended that the results of the SPLP extracts and analyses be presented in Figure 3.12.*

Response **The SPLP results have been added to Figure 3.12 as requested.**

Comment 18 *Figure 3.13: Proposed borehole locations are included in the figure, however, they are not included in the legend. It is recommended that they be included in the legend. Moreover, analyte detected above MSC in soil and in SPLP extracts are included in the legend, however, they are not included in the figure (Figure 3.13). Please revise.*

Response **Proposed borehole has been added to the legend in Figure 3.13. The reference to "Analytes detected above medium-specific concentration (MSC) in soil and in SPLP extract" has been deleted from the legend in Figure 3.13. Full interpretive color-coding of analytical results will be included in the RFI report.**

Comment 19 *Page 3-3, Section 3.1.5, Sentence 2: In the text description, it is indicated that 4 soil borings (B735, B739, B745, and B751) were installed and sampled. However, the borings are not included in Figure 3.3. It is recommended that they be included in the figure.*

Response **The 4 borings are actually piezometer/soil borings (P735, P739, P745, and P751). The locations are on the figure but were mislabeled in the text as (B73X). The text has been revised to state "...4 piezometers/soil borings (P735, P739, P745, and P751) were installed and sampled during the ESC."**

Comment 20 *Figure 3.15: Figure 3-15: Analytes detected above MSC in the soil and in SPLP extracts (yellow) are included in the legend, however, they are not included in the figure. It is recommended that they be included in the figure.*

Response **The reference to "Analytes detected above medium-specific concentration (MSC) in soil and in SPLP extract" has been deleted from the legend in Figure 3.13. Full interpretive color-coding of analytical results will be included in the RFI report.**

RESPONSES TO TNRCC COMMENTS: RCRA FACILITY INVESTIGATION OF SWMU 2853 / LANDFILL 1 NOVEMBER 2000 REMEDIAL PROJECT MANAGER'S MEETING NAS FORT WORTH JRB, TEXAS

Responses to Comments by Mr. Ray Risner (TNRCC)

Comment 1 *Based on the COE rerouting the West Fork Trinity.... Was the landfill waste excavated? Was it removed from site?*

Response **Based on the interpretation of aerial photographs, most of the landfill was certainly excavated when the river was re-channelized. The western portion of each trench may or may not remain in place. Construction records (if they ever existed) regarding the disposition of excavated landfill material could not be found during a search of the Corps of Engineers records. Consequently, surface water/sediment samples will be collected in the West Fork Trinity River within the former landfill boundaries. In addition, a characterization soil boring will be installed adjacent to the former landfill on the eastern bank of the West Fork Trinity River to provide delineation east of the landfill. Soil samples will be collected in 5-foot intervals and analyzed for the Appendix IX list for VOCs, Metals, PAHs, and Pesticides/PCBs. Two "lithology only" soil borings will also be installed to determine if landfill wastes are located on the eastern bank of the river.**

Comment 2 *Is the landfill gone under the riprap on both sides of the river, and even under the river?*

Response **Based on the interpretation of aerial photographs, it is probable that all of the landfill material was removed under the river and the eastern bank of the river. However, as noted above, landfill material may or may not remain in the western-most portion of the former landfill. Results from the geophysics investigation were not conclusive in determining the presence of landfill waste due to presence of rebar in the concrete used for riprap and records regarding the disposition of landfill materials could not be found.**

Comment 3 *How deep was the landfill waste originally in relation to the current depth of the West Fork Trinity?*

Response **As noted in above, records regarding the excavation and disposition of the landfill could not be found. However, most waste encountered at other landfills at Carswell AFB was within 15 feet of the ground surface (or just above the water table). It appears from interpreted aerial photographs that a gently sloping bank existed on the inside of the meander loop where the landfill trenches were located. This would indicate the depth of the trenches decreased to the east, pinching out near the river at the water table, which would be slightly above the current river level.**

Comment 4 *What is the relationship of the saturated zone to river depth and flow?*

Response **In the vicinity of Landfill 1, the elevation of groundwater drops steeply from the northwest to the southeast. The highest groundwater elevation is approximately 545 feet above mean sea level (MSL) at LF01-1B. The groundwater elevation drops off to the river level elevation of approximately 529 feet MSL at WHGLTA104. To support the site conceptual model, further investigation of groundwater elevation and flow using piezometers located along the bank of the river is planned for February 2001.**

Comment 5 *Where precisely are the Federal Property boundaries, on both sides of the river?*

Response **The Federal Property Boundaries end at the fence line for NAS Fort Worth JRB. Tarrant County owns the West Fork Trinity River right of way on both sides of the river.**

FINAL PHASE III WORK PLANS ADDENDUM RCRA FACILITY INVESTIGATION OF SWMUS 17, 26, 28, 29, 30, AND 62 NAS FORT WORTH JRB, TEXAS

Prepared for

U.S. Air Force Center for Environmental Excellence
Brooks AFB, Texas
Contract No. F41624-95-D-8005

Prepared by

HydroGeoLogic, Inc.
1155 Herndon Parkway, Suite 900
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January 2001

REPORT DOCUMENTATION PAGE

Form Approved
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1 AGENCY USE ONLY *(Leave blank)*	2 REPORT DATE January 2001	3 REPORT TYPE AND DATES COVERED Final
4 TITLE AND SUBTITLE Final Phase III Work Plans Addendum RCRA Facility Investigation of SWMUs 17, 26, 28, 29, 30, and 62 NAS Fort Worth JRB, Texas		4 FUNDING NUMBERS F41624-95-D-8005 Delivery Orders 0033
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
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13 ABSTRACT (Maximum 200 words)

This Final Phase III Work Plans Addendum for RCRA Facility Investigations of SWMUs 17, 26, 28, 29, 30, and 62 provides a summary of the ongoing RFI and the justification for additional investigation of soil and groundwater at SWMUs 17, 26, 28, 29, 30, and 62. This Work Plans Addendum presents the soil analytical results produced during the initial RFI for these sites and provides rationale for the selection of additional sampling locations required to delineate concentrations to basewide background levels.

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 document contains the Phase III Final Work Plans Addendum for the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) at solid waste management units (SWMUs) 17, 26, 28, 29, 30, and 62 at the Naval Air Station (NAS) Fort Worth Joint Reserve Base (JRB), Texas.

HydroGeoLogic, Inc. (HydroGeoLogic) prepared this report under contract to the U.S. Air Force Center for Environmental Excellence (AFCEE), Contract No. F41624-95-D-8005, Delivery Order No. 0033, in support of the Air Force Installation Restoration Program (IRP).

Responsible key HydroGeoLogic personnel are as follows:

James Costello, P.G.	Program Manager
Todd Harrah	Project Manager

This contract will be administered by the Defense Contract Management Command, 10500 Battleview Pkwy., Suite 200, Manassas, Virginia, 22110. The Contracting Officer will be Mr. Cliff Trimble. The Contracting Officer's Representative will be Mr. Don Ficklen (210/536-5290), located at the AFCEE/Environmental Restoration Division, 3207 North Road, Brooks Air Force Base (AFB), Texas 78235-5363.

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LIST OF ACRONYMS AND ABBREVIATIONS

AFCEE	U.S. Air Force Center for Environmental Excellence
AFB	Air Force Base
B2EHP	bis(2-ethylhexyl)phthalate
bgs	below ground surface
COPC	contaminant of potential concern
DDD	4,4'-DDD or 1,1'-(2,2-Dichloethylidene)bis-[4-chlorobenzene]
DDE	4,4'-DDE or 1,1'-(Dichloroethenylidene)bis-[4-chlorobenzene]
DDT	4,4'-DDT or 1,1'-(2,2,2-Trichloroethylidene)bis-[4-chlorobenzene]
DPT	direct push technology
EPA	U.S. Environmental Protection Agency
ESC	expedited site characterization
F	data qualifier indicating analyte was detected at a concentration less than PQL but greater than MDL.
HSA	hollow-stem auger
HW	hazardous waste
HydroGeoLogic	HydroGeoLogic, Inc.
IRP	Installation Restoration Program
JRB	Joint Reserve Base
mg/kg	milligrams per kilogram
MEK	methyl ethyl ketone
MTBE	methyl tertiary butyl ether
MQL	method quantitation limit
MSC	medium-specific concentration
NAS	Naval Air Station
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PID	photo-ionization detector
PQL	practical quantitation limit
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation

LIST OF ACRONYMS AND ABBREVIATIONS (continued)

RPM	remedial project manager
RRR	Risk Reduction Rules
RRS	Risk Reduction Standard
SPLP	synthetic precipitation leaching procedure
SVOC	semivolatile organic compound
SWMU	solid waste management unit
TCE	Trichloroethene
TNRCC	Texas Natural Resource Conservation Commission
TPH	total petroleum hydrocarbons
VOC	volatile organic compound
WP	work Plans
WPA	work Plans addendum

TAB

SECTION 2.0

FINAL PHASE III WORK PLANS ADDENDUM RCRA FACILITY INVESTIGATION OF SWMUs 17, 26, 28, 29, 30, and 62 NAS FORT WORTH JRB, TEXAS

1.0 INTRODUCTION

Resource Conservation and Recovery Act (RCRA) Facility Investigations (RFIs) of Solid Waste Management Units (SWMUs) 17, 26, 28, 29, 30, and 62 are currently being conducted in accordance with the hazardous waste (HW) permit HW-50289 issued to the former Carswell Air Force Base (AFB) dated February 7, 1991.

The Phase III delineation and confirmation of contaminants of potential concern (COPCs) was conducted at the subject sites during May of 2000 in an effort to obtain closure under the Texas Natural Resource Conservation Commission (TNRCC) Risk Reduction Rules (RRRs) program. While this field effort was successful in meeting most project objectives, each of the subject SWMUs will require further investigation and/or remediation before a closure request from the TNRCC is appropriate. The SWMUs addressed in this Phase III Work Plans Addendum (WPA) are identified as follows:

- SWMU 17 (Landfill 7)
- SWMU 26 (Landfill 3)
- SWMU 28 (Landfill 1)
- SWMU 29 (Landfill 2)
- SWMU 30 (Landfill 9)
- SWMU 62 (Landfill 6)

This WPA summarizes the field activities conducted at the six SWMUs in support of the RFI and presents rationale for additional soil and groundwater investigations to be conducted at the subject sites. The locations of these sites at Naval Air Station (NAS) Fort Worth Joint Reserve Base (JRB) are presented in Figure 1.1. When delineation of previously identified contamination is complete for each SWMU, all data will be compiled and presented in an RFI Report with a discussion of the Risk Reduction Standard (RRS) that is appropriate for closure at each site.

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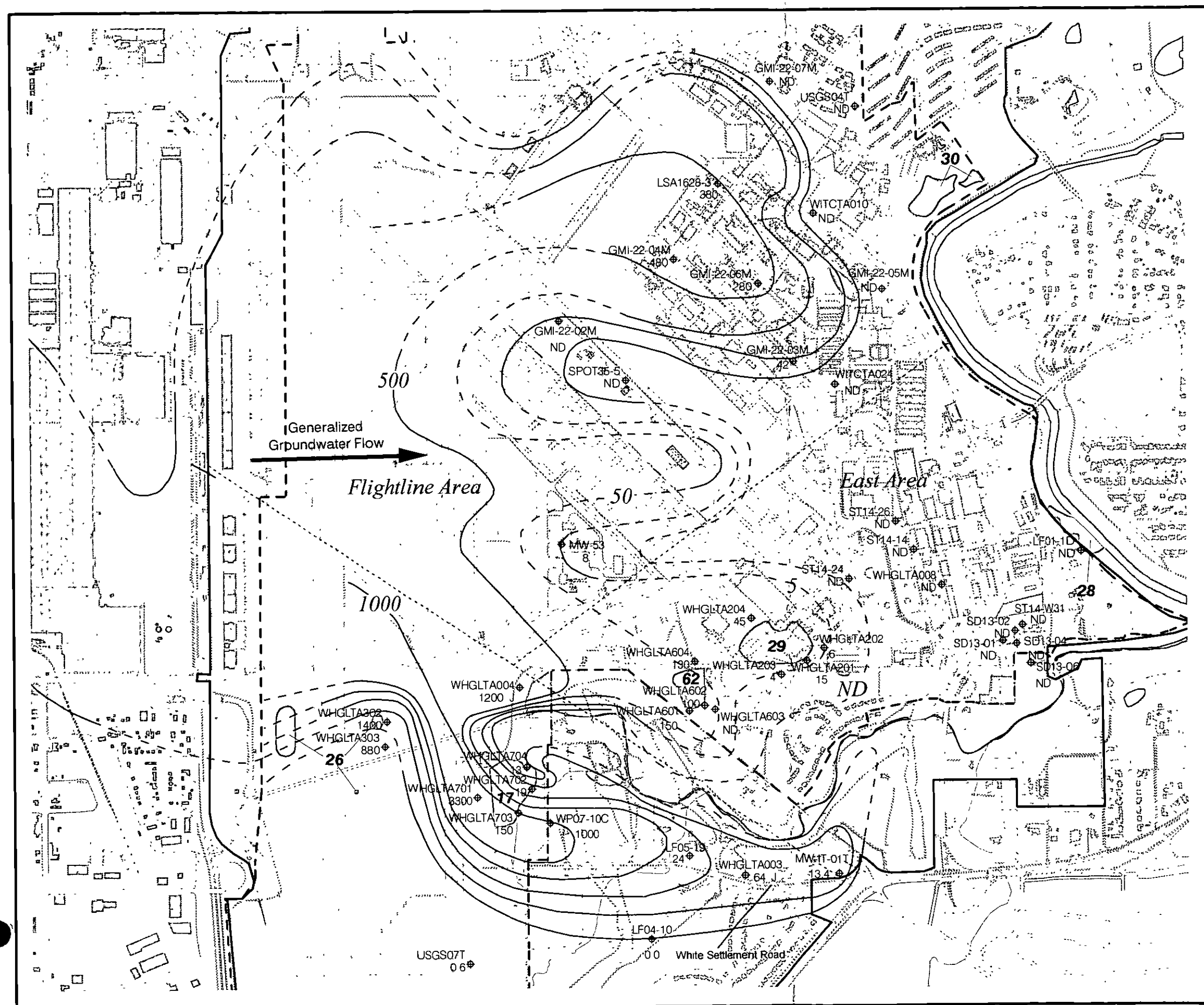
FIGURES



HydroGeoLogic, Inc — Phase III RFI Work Plans Addendum
NAS Fort Worth JRB, Texas

Figure 1.1

SWMU Locations and Regional TCE Plume Terrace Alluvium Groundwater July 2000

U.S. Air Force Center For Environmental Excellence

Legend

- NAS Fort Worth JRB (Carswell Field)
- Former Carswell Air Force Base
- Landfill Boundaries
- GMI-22-07M ◆ 612.52 — Monitoring Well Location / Groundwater Elevation
- –500– TCE Concentration Contour (µg/L)
- GMI-22-07M ◆ 235 — NAS Fort Worth JRB Basewide Sampling Well / TCE Concentration (µg/L)
- GMI-22-07M ◆ 568 — TCE Investigation Well (not part of Quarterly Sampling) / TCE Concentration (µg/L)

N

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SCALE IN FEET

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Project AFC001-33CAB
Created 10/09/98 nzehms
Revised 01/18/01 cf
Map Source HydroGeoLogic, Inc GIS Database

HYDRO GeoLogic INC

TABLES

Project List

FY	CMD	INST	REQT NO	Description	Service	Phase	Risk	Lega	Pri	Agent	Requirement	Validated	Projected	CWE	Committed	Obligated	Expensed
2001	AFCEE	CARSWELL	DDPF20010001	MANAGEMENT	AF	MGT	NR	C	0M	CEE	$374,000	$374,000	$374,000			$190,160	
2001	AFCEE	CARSWELL	DDPF20010002	RESTORATION ADVISORY BOARD SUPPORT	AF	RAB	NR	Z	0M	CEE	$22,623	$22 623	$22,623				
2001	AFCEE	CARSWELL	DDPF20010003	BASEWIDE LONG TERM MONITORING	AF	LTM	NR	C	5B	CEE	$537,000	$537,000	$537,000				
2001	AFCEE	CARSWELL	DOPF20010004	CORRECTIVE MEASURE STUDY FOR LF2 -SWMU29	AF	FS	M	C	2A	CEE	$0	$152,000	$152,000				
2001	AFCEE	CARSWELL	DDPF20010005	REMEDIAL OESIGN FOR LF 7 SWMU17	AF	RD	M	C	2A	CEE	$0	$210,000	$210,000				
2001	AFCEE	CARSWELL	DDPF20010006	LANDFILL 7 REMEDIAL ACTION SWMU17	AF	RA-C	M	C	2A	CEE	$0	$1,662,000	$1,662,000				
2001	AFCEE	CARSWELL	DDPF20010007	CORRECTIVE MEASURES STUDY FDR FT-001	AF	FS	L	C	3A	CEE	$0	$142,000	$42,377				
2001	AFCEE	CARSWELL	DDPF20010009	CORRECTIVE MEASURES STUDY PLAN B - AOC 1	AF	FS	H	C	1A	CEE	$744,000	$86,000					
2001	AFCEE	CARSWELL	DDPF20010010	SITE INVESTIGATION FOR PALEOCHANNEL	AF	SI	NE	C	4A	CEE	$213,000	$211,000					
2001	AFCEE	CARSWELL	DDPF20010011	SUPPLEMENTAL RI AOC 2	AF	RI	M	C	2A	CEE	$200,000	$200,000					
2001	AFCEE	CARSWELL	DDPF20010012	IRA AT VARIOUS LANDFILLS AND WAA's	AF	IRA-O	M	C	2A	CEE	$459,000	$460,000					
2001	AFCEE	CARSWELL	DDPF20010013	RFI at BLDG 1655 OWS	AF	RI	M	C	2A	CEE	$17,000	$20,000					
2001	AFCEE	CARSWELL	DDPF20010014	Site Closeout 21 OWS sites	AF	PCO-S	NR	C	6B	CEE	$34,000	$35,000					
				✓ WP-07 INV						2001 TOTAL:	$2,600,623	$4,111,623	$3,000,000			$190,160	
2002	AFCEE	CARSWELL	DDPF20020001	MANAGEMENT	AF	MGT	NR	Z	0M	CEE	$100,000	$100,000	$100,000				
2002	AFCEE	CARSWELL	DDPF20020002	RESTORATION ADVISORY BOARD SUPPORT	AF	RAB	NR	Z	0M	CEE	$20,000	$20,000	$20,000				
2002	AFCEE	CARSWELL	DDPF20020003	BASEWIDE LONG TERM MONITORING	AF	LTM	NR	C	5B	CEE	$653,000	$653,000	$653,000				
2002	AFCEE	CARSWELL	ODPF20020004	~~CORRECTIVE MEASURE IMPLEMENTATION SWMUs~~ CMS	AF	IRA-C	M	C	2A	CEE	$400,000	$400,000	$400,000				
Dont Worry 2002	AFCEE	CARSWELL	DDPF20020005	Permit modifications/Site Closure SWMUs	AF	PCO-S	NR	C	6B	CEE	$750,000	$750,000	$750,000				
2002	AFCEE	CARSWELL	DDPF20020009	AOC 1 ORA-O O&M	AF	IRA-O	H	C	1A	CEE	$100,000	$100,000	$100,000				
2002	AFCEE	CARSWELL	DDPF20020010	RI of Paleochannel	AF	RI	M	C	2A	CEE	$500,000	$500,000	$500,000				
2002	AFCEE	CARSWELL	DDPF20020015	Reactive Wall IRA-O O&M	AF	IRA-O	M	C	2A	CEE	$75,000	$75,000	$75,000				
										2002 TOTAL:	$2,598,000	$2,598,000	$2,598,000				
										CARSWELL TOTAL:	$5,198,623	$6,709,623	$5,598,000			$190,160	

Gas Station

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Project List

FY	CMD	INST	REQT NO	Description	Service Phase	Risk	Lega	Pri	Agent	Requirement	Validated	Projected	CWE	Committed	Obligated	Expensed
									AFCEE TOTAL:	$5,198,623	$6,709,623	$5,598,000			$190,160	
									GRAND TOTAL:	$5,198,623	$6,709,623	$5,598,000			$190,160	

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Project List - Projects with Sites

FY	CMD	INST	REQT NO	Service	Site ID	Site Name	SC	LAW	Rel Risk	Priority	Phase	Agent	Requirement	Projected	Obligated
2001	AFCEE	CARSWELL	DDPF20010001	AF						0M	MGT	CEE	$374,000	$374,000	$190,160
			DDPF20010002							0M	RAB	CEE	$22,623	$22 623	
			DDPF20010003		ST001	POL TANK FARM, SWMU 68	12/1/11	R	NR	5B	LTM	CEE	$107,000	$107 000	
					ST002	ABANDONED GAS STATION, AOC 7	12/1/11	R	NR	5B	LTM	CEE	$108,000	$108 000	
					ST003	FRENCH UNDERDRAIN, SWMU 64, 67	12/1/11	R	NR	5B	LTM	CEE	$214 000	$214 000	
					ST005	FUEL HYDRANT SYSTEM AOC 4	8/15/01	R	MED	5B	LTM	CEE	$108 000	$108 000	
			DDPF20010004		LF002	LANDFILL 2, SWMU 29	8/1/12	R	MED	2A	FS	CEE	$0	$152 000	
			DDPF20010005		LF005	LANDFILL 7, SWMU 17	1/1/12	R	MED	2A	RD	CEE	$0	$210 000	
			DDPF20010006		LF005	LANDFILL 7, SWMU 17	1/1/12	R	MED	2A	RA-C	CEE	$0	$1,662,000	
			DDPF20010007		FT001	FTA-2, INCLUDES SWMUS 19,20 21	9/30/01	R	Low	3A	FS	CEE	$0	$42,377	
			DDPF20010009		ST004	BASE GAS AND SERVICE STATIONS, AOC 1	12/1/11	R	High	1A	FS	CEE	$744,000		
			DDPF20010010		AOC20	PaleoChannel		R	High	4A	SI	CEE	$213,000		
			DDPF20010011		WP002	AIRFIELD GROUNDWTR PLUME, AOC 2	9/30/01	R	MED	2A	RI	CEE	$200,000		
			DDPF20010012		LF001	LANDFILL 1, SWMU 28	10/1/08	R	MED	2A	IRA-O	CEE	$259,000		
					LF002	LANDFILL 2, SWMU 29	8/1/12	R	MED	2A	IRA-O	CEE	$100,000		
					LF003	LANDFILL 3, SWMU 26	11/1/04	R	Low	2A	IRA-O	CEE	$100,000		
			DDPF20010013		SD002	BLDG 1194 OWS,SWMU 35	8/1/02	R	Low	2A	RI	CEE	$17,000		
			DDPF20010014		SD002	BLDG 1194 OWS,SWMU 35	8/1/02	R	Low	6B	PCO-S	CEE	$17,000		
					SD003	BLDG 1191 OWS, SWMU 37	9/30/02	R	Low	6B	PCO-S	CEE	$17,000		
											CARSWELL TOTAL:		$2,600,623	$3,000,000	$190,160
											AFCEE TOTAL:		$2,600,623	$3,000,000	$190,160

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Project List - Projects with Sites

FY	CMD	INST	REQT NO	Service	Site ID	Site Name	SC	LAW	Rel Risk	Priority	Phase	Agent	Requirement	Projected	Obligated
2002	AFCEE	CARSWELL	DDPF20020001	AF						0M	MGT	CEE	$100,000	$100,000	
			DDPF20020002							0M	RAB	CEE	$20,000	$20 000	
			DDPF20020003		LF004	LANDFILL 6, SWMU 62	12/1/05	R	Low	5B	LTM	CEE	$350,000	$350,000	
					LF005	LANDFILL 7, SWMU 17	1/1/12	R	MED	5B	LTM	CEE	$303,000	$303,000	
			DDPF20020004		LF001	LANDFILL 1, SWMU 28	10/1/08	R	MED	2A	IRA-C	CEE	$200,000		
					~~LF002~~	~~LANDFILL 2, SWMU 29~~ SWMUs 19, 20 & 21	8/1/12	R	MED	2A	IRA-C	CEE	$200,000		
			DDPF20020005		LF001	LANDFILL 1, SWMU 28	10/1/08	R	MED	6B	PCO-S	CEE	$250,000	$250,000	
					LF002	LANDFILL 2, SWMU 29 FT-01	8/1/12	R	MED	6B	PCO-S	CEE	$250,000	$250,000	
					LF005	LANDFILL 7, SWMU 17	1/1/12	R	MED	6B	PCO-S	CEE	$250,000	$250,000	
			DDPF20020009		ST004	BASE GAS AND SERVICE STATIONS, AOC 1	12/1/11	R	High	1A	IRA-O	CEE	$100,000	$100,000	
			DDPF20020010		AOC20	PaleoChannel		R	High	2A	RI	CEE	$500,000	$500,000	
			DDPF20020015		LF006	LANDFILL 8, SWMU 25	3/30/05	R	MED	2A	IRA-O	CEE	$75,000	$75,000	
										CARSWELL TOTAL.			$2,598,000	$2,198,000	
										AFCEE TOTAL.			$2,598,000	$2,198,000	
										GRAND TOTAL·			$5,198,623	$5,198,000	$190,160

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Table 1.1
SWMU Summary Information
NAS Fort Worth JRB, Texas

IRP Site ID	SWMU No.	Description	Reported Materials Received	Reported Operation Dates	Approximate Acreage	Wastes Encountered
LF07	17	Landfill 7	Construction waste and rubble; possibly small amounts of hazardous wastes	1978-1983	5.2 acres	Concrete, rebar, asphalt, metal, bottle caps, drums, pieces of chain link fencing, creosote-stained wood, brick, plastic, glass, and aircraft aluminum; some petroleum staining in the soil below the water table.
LF03	26	Landfill 3	Construction rubble glass, cans; possibly small amounts of hazardous wastes	1950-1952	2.5 acres	Asphalt, wood fragments (some stained with creosote), bottle caps, glass, and scrap metal; possible hydraulic fluid.
LF01	28	Landfill 1	Unknown. Reportedly original Carswell AFB landfill.	1940s	1.9 acres	Pieces of bottles, wood, metal wire, glass/porcelain, metal debris, and "Formica™;" concrete rubble and asphalt
LF02	29	Landfill 2	Construction rubble and materials, moderate quantities of unspecified hazardous wastes	1952-1956	5.7 acres	Petroleum-stained soils and free product; concrete, asphalt, wood, glass, newspaper, wire, plastic, wood chips with a creosote odor, and traces of metal cans
LF09	30	Landfill 9	Construction rubble and trees; possibly small amounts of hazardous wastes	1978-1983	3.1 acres	Concrete, asphalt, painted wood, paint chips, metal wire, rebar, pieces of metal, and brick.
LF06	62	Landfill 6	Construction rubble, drums of hydraulic fluid, and small quantities of hazardous wastes	1975-1978	2.3 acres	Concrete, asphalt, wood (some stained with creosote), metal, and glass; some stained soils with a petroleum odor.

Source(s):

RCRA Facility Assessment, Preliminary Review/Visual Site Inspection, A.T. Kearney, 1989.

Boring logs from ongoing RCRA Facility Investigation at SWMUs 17, 26, 28, 29, 30, and 62, HydroGeoLogic, 1998-2000.

TAB

SECTION 2.0

2.0 PROJECT BACKGROUND

The NAS Fort Worth JRB RCRA permit HW-50289 requires a RFI of all SWMUs listed in Permit Provision VIII (as well as those SWMUs subsequently added to the list) in order to determine whether any of the hazardous constituents listed in 40 Code of Federal Regulations, Part 264, Appendix IX, have been released into the environment.

2.1 CURRENT INVESTIGATION

Initial RFI field activities at SWMUs 17, 26, 29, 30, and 62 were conducted between February and June 1998. RFI activities at SWMU 28 were initiated in December 1998. The RFI Work Plans (WPs) and this WPA have been prepared using guidance documents from the Installation Restoration Program (IRP), RCRA, the U.S. Environmental Protection Agency (EPA), and the TNRCC RRRs program.

The initial phase of RFI sampling was conducted in accordance with the Final WPs prepared by HydroGeoLogic (HydroGeoLogic, 1998a). The WPs contained the Field Sampling Plan the Health and Safety Plan, which were followed during all sampling activities. The Final Basewide Quality Assurance Project Plan, prepared by HydroGeoLogic in February 1998 and updated in March 2000, was also used as guidance for managing specific quality assurance and quality control procedures, as well as analytical data generated from the field investigations (HydroGeoLogic, 1998b and 2000b).

An initial soil assessment was conducted at each site, focusing on characterizing any potential contaminant sources and providing a preliminary evaluation of the nature and extent of any contamination detected. The analytical results of the inorganic samples collected during this initial investigation were compared to the NAS Fort Worth JRB background values to determine if closure under RRS 1 was appropriate. The NAS Fort Worth JRB background values for inorganic compounds are presented in the Final Basewide Background Study (Jacobs, 1998). As background values are not available for organic compounds, the investigation results for organic compounds were compared to method quantitation limits (MQLs) for consideration of closure under RRS 1.

The results of initial investigations were reviewed to determine if the full nature and extent of contamination had been determined. Based on this evaluation, it was determined that the initial RFI activities did not provide sufficient data to describe the complete nature and extent of contamination present at the six subject SWMUs. As a result, further delineation of contamination is required at these six sites. Additional soil borings will be installed, surface water/sediment samples will be collected, and groundwater sampling of new and existing wells will be performed to continue characterization of contaminants identified during the previous sampling rounds at each SWMU. Once the delineation of COPCs is complete at each of the subject sites, the data will be compiled and presented in a RFI Report with a discussion of the RRS that is appropriate for closure at each site.

If the RRS 2 medium-specific concentrations (MSCs) are exceeded during this investigation, then either 1) "hot spot" remediation to achieve RRS 2 levels will be recommended, or 2) closure under RRS 3, which includes preparation of a baseline risk assessment and, if necessary, a corrective measures study, will be recommended.

2.2.1 Investigation Objectives

The overall objective of this project is to obtain closure of the SWMUs under the TNRCC RRRs program. An overview of the RRRs is presented in the project WPs and Technical Memorandum (HydroGeoLogic, 1998a and 1998c). In addition, the SWMUs at NAS Fort Worth JRB are subject to the specific requirements of the TNRCC HW permit number HW-50289. Specific permit requirements are also discussed in greater detail in Section 3.2 of the project WPs (HydroGeoLogic, 1998a). Appropriate project field tasks, presented in the following sections, were employed to obtain the type of data required to characterize the subject SWMUs.

Organic analytical results from all sampling events were compared to RRS 1 values and inorganic analytical results were compared to base-specific background values as determined by the Final Basewide Background Study (Jacobs, 1998). This evaluation revealed that additional sampling is required at all six SWMUs to adequately characterize and delineate concentrations to background levels, as required per 30 Texas Administrative Code §335 Subchapter S, Risk Reduction Rules.

In summary, the RFI was designed and is being conducted to achieve the following objectives:

- Determine if a release from the units has occurred. During the initial investigation, borings were completed to the top of the water table using direct push technology (DPT) methods at each SWMU, and soil samples were collected every 5 feet.

- Determine the nature and extent of potential contamination. Section 3.0 of this WPA presents current delineation/characterization needs to meet this objective at each of the SWMUs. Field methods that will be utilized during this RFI include additional soil boring installation using DPT, soil sample collection from selected boring intervals, surface water and sediment sampling, installation of new monitoring wells, and groundwater sampling from new and existing monitoring wells.

- Utilize the Synthetic Precipitation Leaching Procedure (SPLP) on contaminants detected at Standard 3 concentrations to determine site-specific MSCs. Current site-specific MSCs are presented and proposed SPLP sampling is discussed in Section 3.0 of this WPA.

TAB

SECTION 3.0

3.0 ANALYTICAL RESULTS AND PROPOSED SAMPLING

A chronology of sampling events and a discussion of analytical results in soil and groundwater at each of the six subject SWMUs are presented in the following sub-sections. Rationale for proposed additional sampling required to obtain closure under TNRCC RRS 2 or RRS 3 is also presented. Analytical data summarizing three rounds of sampling is presented on figures in Section 3.0. In addition, tables outlining Standard 2 and 3 issues as well as characterization issues have been prepared as a supplement to the discussions and figures.

3.1 SWMU 17/LANDFILL 7

3.1.1 Characterization Sampling and Results

SWMU 17 (Landfill 7) was initially investigated by HydroGeoLogic during the period of March through May 1998. During the characterization phase (Phase I) of the investigation, 17 soil borings were advanced, 4 of which were drilled using a hollow stem auger (HSA) and converted into groundwater monitoring wells. Soil samples were collected from the 4 borings every 5 feet from the ground surface to the top of the water table. These samples were analyzed for the full suite of Appendix IX analytes in accordance with the RCRA HW permit. The remaining 13 soil borings were advanced using DPT to delineate the landfill boundaries. Between May and December 1998, three rounds of groundwater samples were collected from the four monitoring wells. As shown on Figure 3.1, the primary COPCs identified in soil during the characterization phase (gray headers) were arsenic, cadmium, chromium, lead, mercury, polychlorinated biphenyl (PCB)-1254, chlordane, 4,4'-DDE (DDE), and polycyclic aromatic hydrocarbons (PAHs).

3.1.2 Phase II Sampling and Results

In January 1999, four borings were advanced during the second phase of the investigation; two borings for confirmation/SPLP of arsenic, cadmium, chromium, lead, mercury, PCB-1254, chlordane, DDE, and PAHs; and two borings to delineate mercury, PCB-1254, chlordane, and DDE (yellow headers). As depicted on Figure 3.1, confirmation/SPLP results for BHGLTA719 (B719) indicated that arsenic, mercury, chlordane, and PCB-1254 were not confirmed; however, confirmation-boring B719 was located approximately 40 feet to the northeast of the original boring B704. Therefore, results from this boring provide only delineation information for mercury, arsenic, chlordane, and PCB-1254. At B701/B718, confirmation/SPLP results showed that chromium was not confirmed; cadmium and PAHS were confirmed at lesser concentrations that passed SPLP; and lead was confirmed at a lesser concentration that failed SPLP. Chlordane, DDE, surficial mercury, and PCB-1254 were delineated. Delineation gaps and Standard 3 gaps remained for arsenic, lead, cadmium, PAHs, chlordane, and PCB-1254. No COPCs were detected in the first two rounds of groundwater sampling. Round 3 groundwater results collected in December 1998 revealed detections of benzene and benzene related compounds at WHGLTA704 (W704). Additional groundwater samples were collected from W704 in April 1999 and October 1999 to monitor benzene and the suite of benzene related compounds. These results showed that benzene concentrations had

decreased significantly but still remained at Standard 3 concentrations. The latest round of groundwater results from W704, collected in April 2000, shows that benzene has dropped to a Standard 2 concentration. Arsenic was also detected at all three of the SWMU 17 downgradient monitoring wells (W702, W703, and W704) in December 1998. A brief discussion of groundwater results is presented in subsection 3.14. A more detailed discussion of groundwater results is presented in the Phase III RFI WP (HydroGeoLogic, 2000a).

3.1.3 Phase III Soil Sampling and Results

Phase III sampling was performed in April 2000. A total of 4 soil borings (B726, B727, B728, and B729) were installed for confirmation/SPLP of PAHs. PAHs were generally confirmed at lower concentrations; however, the highest concentrations of PAHs at SWMU 17 were detected at B728. SPLP was not run on these samples because the SPLP extract was prepared for EPA Method SW8270, not EPA Method SW8310, which has lower detection limits than EPA Method SW8270. Boring B727 was also used to confirm detections of arsenic, mercury, chlordane, and PCB-1254 at B704. Analytical results indicate that arsenic and PCB-1254 were not detected in confirmation samples. Mercury and chlordane were both detected at Standard 2 concentrations significantly lower than the original Standard 3 results, therefore, SPLP extraction and analysis was not performed.

Six borings (B720C, B721, B722, B723B, B724, and B725) were installed to delineate barium, cobalt, lead, subsurface mercury, 2-hexanone, and PAHs. Analytical results indicate that barium, cobalt, mercury, and 2-hexanone are delineated. However lead and PAHs are not completely delineated. Using Tables 3.1 and 3.2 along with Figure 3.1 and 3.4 will assist in finding delineation locations for each compound. Note that the detection of cadmium at B701 was not included on the analyte list for the western delineation boring B727; however, as EPA Method SW6010 was used to analyze the sample from B727, results for cadmium will be obtained for western delineation of cadmium at B727. It should also be noted that the lead detection at B723B passed SPLP and provides the current site-specific MSC of 73.1 mg/kg at SWMU 17.

3.1.4 Groundwater Sampling and Results

As depicted in Figure 3.2, analytical results from the first three rounds of groundwater sampling reveal Standard 2 and 3 detections of chlorinated solvents associated with the regional trichloroethene (TCE) plume (Figure 1.1). Sporadic and low Standard 2 concentrations of cobalt, iron, manganese, potassium, and chlorobenzene were also detected in monitoring wells located downgradient of SWMU 17. Note that arsenic was detected at Standard 2 concentrations (>0.0049 mg/L) in all three downgradient monitoring wells in the December 1998 sampling event. In addition, confirmation sampling of groundwater at W702 in April 2000 indicates Standard 2 concentrations of arsenic remain in groundwater downgradient of SWMU 17. Analytical results from groundwater samples collected during the January 2000 sampling event for the RFI of SWMUs 22, 23, 24, and 25 delineate arsenic to the east (the general downgradient direction) at LF05-5B and LF05-5C. However, arsenic was detected at

WP07-10C to the southeast (HydroGeoLogic, 2000c). It should be noted that arsenic was not detected at WP07-10C in the January 1998 groundwater-sampling event. Arsenic was delineated to the north at FT08-11A and to the south at WP07-10A during the January 2000 sampling event. Arsenic was not detected west of SWMU 17 in the upgradient-monitoring well W701. Benzene was also detected at W704 with Standard 3 concentration in December 1998 and decreasing Standard 3 concentrations detected in April 1999 and October 1999. The benzene concentration at W704 had decreased to Standard 2 by April 2000.

3.1.5 Expedited Site Characterization

An Expedited Site Characterization (ESC) to delineate benzene and the benzene related compounds detected in groundwater at W704 was also performed in April 2000. As depicted in Figure 3.3, a total of 25 piezometers, PHGLTA724 (P724) and P730-P753; 2 monitoring wells (W705 and W706), and 4 piezometers/soil borings (P735, P739, P745, and P751) were installed and sampled during the ESC. Four existing monitoring wells (W702, W704, FT08-11A, and FT08-11B) were also sampled during the ESC. Samples were immediately analyzed in a mobile laboratory with lab-grade Gas Chromatographs using EPA Method SW8021. Selected samples were split and sent to a fixed-based laboratory for confirmation analysis using EPA level-3 definitive methodologies. Results of the ESC investigation indicate that P732, P736, and P742 have delineated benzene with definitive data to the east in the downgradient direction by monitoring wells W705 and W706, to the north with screening data by FT08-11, to the south with definitive data by W702, and to the west with screening data by P736 and P742. Screening data showed delineation to the southwest by P743. However, a sample taken a few days later for definitive analysis had a detection of benzene at a concentration of 0.008 mg/L. Therefore, the benzene plume is not completely delineated to the west-southwest in groundwater. Further delineation of benzene-impacted groundwater to the west-southwest is recommended.

The benzene-related compounds - ethylbenzene, toluene, total xylenes, isopropylbenzene, *n*-propylbenzene, *tert*-butylbenezene, *sec*-butylbenzene, and *p*-isopropyltoluene were encountered in groundwater in P735, P741, P745, and P746 (Table 3.3). These compounds were all delineated by non-detects in the remaining piezometers. A total of 22 soil samples collected from 8 soil borings (B701, B702, B703, B704, B735, B739, B745, and B751) were analyzed for VOCs during the RFI of SWMU 17. Results from these analyses show that benzene was not encountered in any soil samples collected above the water table within SWMU 17. A definitive source of benzene-impacted groundwater at SWMU 17 has not yet been determined. A Standard 3 concentration of acrylonitrile was detected in the 10-foot interval of B735 (Figure 3.1), however, acrylonitrile was not detected in any groundwater samples.

3.1.6 Proposed Sampling

As presented above, analytical results from surface soil and subsurface soil samples collected at SWMU 17 indicate that additional sampling is required for characterization, confirmation/SPLP, and delineation of COPCs to background concentrations. Figure 3.4

illustrates 11 proposed soil boring and 3 proposed soil boring/monitoring well locations. Soil borings B765, B768, and B770 will be advanced adjacent to borings B723B, B725, and B728 (respectively) to obtain soil samples for confirmation analyses and SPLP extraction of lead and/or PAHs. Soil boring B764 will be advanced adjacent to B702 for confirmation/SPLP of chromium, lead, and PAHs. Soil boring B769 will be advanced adjacent to P735 for confirmation/SPLP of acrylonitrile. Soil boring B771 will be installed south of Landfill 7 to delineate PAHs; soil boring B767 will be installed north of Landfill 7 to delineate lead, volatile organic carbons (VOCs), and PAHs; and soil boring B766 will be installed east of Landfill 7 to delineate lead, acrylonitrile, and PAHs. In addition, soil borings B761, B762, and B763 will be installed within the landfill to locate potential source area(s) of the arsenic contamination found in groundwater downgradient of SWMU 17. Soil samples from monitoring well locations W707, W708, and W709 will be collected from the interval exhibiting the highest photo-ionization detector (PID) reading and from the interval just above the water table. These samples will be analyzed for VOCs to characterize potential source area(s) for benzene. Note that the primary driver for the installation of monitoring wells W707, W708, and W709 is to provide upgradient delineation of benzene in groundwater. Consequently, the locations of monitoring wells W707, W708, and W709 may be shifted further upgradient (to the west) if it is determined in the field that delineation will not be achieved at the proposed location(s). Rationale for selection of soil boring locations is provided in Tables 3.1 and 3.2. Proposed boring and monitoring locations are presented in Figures 3.3 and 3.4.

In addition, 10 monitoring wells (FT08-11A, W701, W702, W703, W704, W705, W706, W707, W708, and W709) will be sampled for VOCs (Non-appendix IX list) to delineate benzene and the benzene-related compounds. Four monitoring wells W701, W703, WP07-10C, and LF05-5F, will also be sampled to confirm Standard 2 detections of arsenic downgradient of SWMU 17.

3.2 SWMU 26/LANDFILL 3

3.2.1 Soil Characterization Sampling and Results

SWMU 26 (Landfill 3) was initially investigated by HydroGeoLogic during the period of March through May 1998. Throughout the course of the investigation, a total of 26 soil borings were installed, 4 of which were converted into piezometers. Soil samples were collected every 5 feet from the ground surface to the top of the water table for Appendix IX analysis from each of these 4 borings, for a total of 16 soil samples collected for Appendix IX analysis. The remaining 22 soil borings were advanced for the purpose of delineating the landfill boundaries. As shown on Figure 3.5, the primary COPCs identified in soil during the Round 1 soil characterization phase were thallium, zinc, antimony, chromium (total), lead, acetone, ethylbenzene, methyl ethyl ketone (2-butanone), and 2-hexanone.

3.2.2 Groundwater Sampling and Results

In addition to the soil borings, two downgradient monitoring wells were installed in the northeast quadrant. Between May and December 1998, attempts were made to collect three rounds of groundwater samples from the installed monitoring wells. An existing monitoring well located near the site (LF03-3D), was added to the sampling program based on AFCEE direction at the September 11, 1998, Remedial Project Manager's (RPM) meeting. Groundwater sampling results are presented in Figure 3.6. It should be noted that due to insufficient thickness of the groundwater column, W303 could not be sampled for two of the three sampling rounds. As shown on Figure 3.6, the primary COPCs identified during the three sampling rounds were 1,1-dichloroethane, 1,1-dichloroethene, *cis*-1,2-dichloroethene, *trans*-1,2-dichloroethene, TCE, vinyl chloride, chloroform, bis(2-ethylhexyl)phthalate (B2EHP), mercury, iron, manganese, barium, calcium, potassium, magnesium, and sodium. Most halogenated VOCs detected in groundwater are associated with the regional TCE plume. Confirmation sampling was performed for mercury in April 2000. Mercury was not detected in the April 2000 sampling event. Other compounds detected are either essential nutrients, sporadically detected, or were considered to be laboratory artifacts.

3.2.3 Phase II Soil Sampling and Results

In January 1999, five borings were advanced during the second round of the investigation: one boring to confirm initial results and obtain soil samples for SPLP extraction, and four borings to delineate known contaminants of concern. A summary of the January 1999 subsurface soil and SPLP results is presented on Figure 3.5. The rationale used to determine whether further action is warranted for compounds detected at Standard 3 and 2 concentrations is presented in Tables 3.4 and 3.5. As shown on Figure 3.5, the primary COPCs identified in the Round 2 soil characterization were lead, silver, acetone, and 2-hexanone. In the soil boring B324, lead was confirmed at a Standard 3 concentration. However, this lead contaminated sample failed SPLP, with an extract concentration slightly above the groundwater MSC.

3.2.4 Phase III Soil Sampling and Results

In April 2000, Phase III sampling was conducted at SWMU 26 (Landfill 3). As depicted in Figure 3.5, three soil borings were advanced for confirmation/SPLP of lead. In all three soil samples, lead was detected either below the MSC in soil, or below the groundwater MSC in the SPLP extract. As presented in Table 3.4 and Figure 3.5 lead has been completely delineated.

3.2.5 Proposed Sampling

Although all COPCs at this landfill have been addressed and delineated, it was determined that the large landfill area in the northwest quadrant was not adequately characterized. Therefore, two additional characterization soil samples will be collected and analyzed using the Appendix IX analyte list for VOCs, semivolatile organic carbons (SVOCs), pesticides/PCBs, metals, and

mercury at soil borings B333 and B334. These two borings are depicted on Figure 3.5 and presented on Table 3.6. In addition, groundwater from monitoring well HM-127 will be sampled again to confirm the presence or absence of lead downgradient of SWMU 26.

3.3 SWMU 28/LANDFILL 1

3.3.1 Soil Characterization Sampling and Results

SWMU 28 (Landfill 1) was initially investigated by HydroGeoLogic during the period of December 1998 through June 1999. During the first round of the investigation, three soil borings were advanced, all of which were drilled using a HSA and converted into groundwater monitoring wells. Per the May 19, 1999, RPM meeting, monitoring well W104 was installed southeast of the landfill in June 1999. With the exception of intervals with no recovery or intervals that encountered waste, soil samples were collected from these borings every 5 feet from the ground surface to the top of the water table. These samples were analyzed for the Appendix IX suite of analytes in accordance with the RCRA HW permit. Soil samples that were not collected due to poor recovery during the installation of monitoring wells were subsequently collected with a DPT rig. Summaries of the surface soil and subsurface soil detections above the method detection limit are presented in Figure 3.7. Standard 3 COPCs detected in soil during characterization sampling at SWMU 28 include antimony, arsenic, barium, cadmium, chromium, lead, selenium, PCBs, 4,4'-DDD (DDD), DDE, and PAHs. Standard 2 COPCs included cobalt, copper, mercury, silver, sulfide, tin, zinc, DDE, benzene and PAHs.

3.3.2 Groundwater Sampling and Results

Between December 1998 and June 1999, three rounds of groundwater samples were collected from each of the three monitoring wells (W101, W102, and W103) installed during the first round of the RFI. Similarly, three rounds of groundwater samples were collected from W104 between July and November 1999. These results are presented in Figure 3.8. The primary Standard 3 COPC detected in groundwater was arsenic, which was detected at a Standard 3 concentration in the third round at W102. The isolated detection of B2EHP at W104 is considered to be a laboratory artifact. Standard 2 COPCs included copper, iron, lead, manganese, silver, zinc, 1,2,4-trimethylbenzene, sec-butylbenzene, and tert-butylbenzene. Of the Standard 2 detections, only lead was detected consistently. Lead was detected in the October 1997 sampling event at LF01-1B conducted by Radian in 1985. Lead was also detected during the sampling event at W101, W102, and W103 conducted by HydroGeoLogic in January 1999. Each of the HydroGeoLogic wells is located within the landfill itself where Standard 3 detections of lead were encountered in the soil. It should be noted that lead was not detected in rounds 2 and 3 at W101, W102, and W103 nor was lead detected in W104 in all three rounds of sampling (Figure 3.8).

3.3.3 Phase II Soil Sampling and Results

Phase II activities included the installation of soil borings B101, B102, and B103 adjacent to monitoring wells W101, W102, and W103, respectively, to obtain soil samples for confirmation/SPLP of Standard 3 COPCs and to fill in data gaps from missing intervals. Analytical results from B101/W101 confirmed the presence of antimony (10-foot interval) and lead (5-foot interval) at concentrations of 4.9 milligrams per kilogram (mg/kg) and 157 mg/kg. Both detections passed SPLP and provide the site-specific MSCs for SWMU 28. PAHs were also detected in the 5 and 10-foot intervals, but the SPLP detection limits were either too high (due to dilutions) or the data was rejected. Therefore, the SPLP results do not qualify the original totals for site-specific MSCs. Confirmation samples in the 15-foot interval of B101/W101 were not collected because water was encountered.

Phase II confirmation results from B102/W102 in the surface interval did not confirm PCB-1254 at a Standard 3 concentration. The detection was just above the practical quantitation limit (PQL), or a non-detect. Analytical results from B102/W102 in the 5-foot interval did not confirm antimony results above background concentrations. However, the Standard 3 concentration of chromium was confirmed at a significantly lower concentration of 45.3 mg/kg and lead was confirmed at a significantly higher concentration of 2080 F mg/kg. Chromium passed SPLP and provides the site-specific MSC. The concentration of lead was deemed too extreme to successfully run SPLP. Analytical results from B102 in the 10-foot interval revealed Standard 3 concentrations of antimony (1.8 mg/kg), cadmium (19.6 mg/kg), chromium (29.4 mg/kg) and lead (2270 mg/kg). Antimony and cadmium passed SPLP and provide site-specific MSCs for SWMU 28. Chromium is below the site-specific MSC and the concentration of lead was deemed too high to successfully run SPLP. Zinc was also detected in the 10-foot interval of B102 at the elevated Standard 2 concentration of 1090 mg/kg.

Phase II confirmation results from B103/W103 in the surface interval confirmed the detection of cadmium below the site-specific MSC. Lead was also confirmed at a concentration (327 mg/kg), which was also deemed too high to successfully run SPLP.

Soil boring B105 delineated metals to background or near background levels north of SWMU 28; however, the antimony result in the 10-foot interval was rejected. PAHs were also delineated north of the landfill by B105. With the exception of the lead detection in the 5-foot interval of soil boring B106, metals are delineated west of the central portion of SWMU 28. However, PAHs were not delineated to the west of the landfill in the 5-foot interval of B106. Analytical results at B107 show that metals are delineated west of the southern portion of SWMU 28; however, PCB-1254 was detected at a Standard 3 concentration of 0.14 mg/kg. Note that refusal was encountered at a depth of 7 feet below ground surface (bgs) in bedrock at boring B107. Metals were delineated southwest and south of SWMU 28 by soil borings B108 and B109, respectively.

3.3.4 Proposed Sampling

Analytical results from Phase II soil samples collected at SWMU 28 (Landfill 1) indicate that additional sampling is required for confirmation/SPLP and delineation to background concentrations. Proposed Phase III sampling locations are depicted on Figure 3.7 with tan colored headers. Confirmation/SPLP sampling will be conducted at B101/W101 for PAHs, metals, and pesticides. Confirmation/SPLP samples will also be collected at B106 for PAHs, B107 for PCB-1254, LF01-1B for selenium, and LF01-1F for arsenic and antimony. Delineation sampling locations B110, B111, B112, B113, and B114 will be used to delineate various Standard 2 and 3 compounds to the north, south, and west of the landfill. The sampling rationale for these borings is presented in Tables 3.7 and 3.8. Piezometers will also be installed in selected boring locations to obtain groundwater elevation data needed to support the conceptual site model. Monitoring well W102 will also be sampled for metals to confirm the presence of lead detected in the first round of sampling and arsenic detected in the last round of sampling. In addition, as outlined in Table 3.9, four surface water and sediment samples will be collected to characterize the potential impact of SWMU 28 COPCs on the West Fork Trinity River. One sampling location will be located upstream of the landfill, two sampling locations will be located adjacent to the landfill, and one sampling location will be located downstream of the landfill. In addition, a characterization soil boring, B115, will be installed on the eastern side of the West Fork Trinity River to determine if COPCs exist on the eastern bank and to potentially delineate COPCs east of SWMU 28. Soil borings B116 and B117 will be continuously cored to provide visual and lithologic descriptions of soil in order to delineate potential landfill boundaries east of the West Fork Trinity River. Piezometers will be installed at B115, B116, and B117 to obtain groundwater elevation data.

3.4 SWMU 29/LANDFILL 2

3.4.1 Soil Characterization Sampling and Results

SWMU 29 (Landfill 2) was initially investigated by HydroGeoLogic during the period of March through May 1998. During the first round of investigation at SWMU 29, a total of 24 soil borings were installed, 8 of which were converted into piezometers. Twenty soil borings were advanced solely for the purpose of delineating landfill boundaries. Four soil borings were used to collect soil samples in 5-foot intervals from the ground surface to the top of the water table and were submitted for chemical analysis, for a total of 16 soil samples collected for Appendix IX analysis. The locations of soil borings and analytical results are presented in Figure 3.9. Note only detections over RRS 1 are presented in Figure 3.9 for Phase I results (gray table headers) and Phase II results (yellow headers). Tables containing Phase III results (green headers) present all results (non-detects and results < RRS 1). The primary COPCs detected in soil during the characterization phase included antimony, barium, cadmium, chromium, lead, mercury, aldrin, heptachlor epoxide, and PAHs. Petroleum stained soils were also encountered in several locations within the landfill. A summary of the SWMU 29 Standard 3 and Standard 2 issues are presented in Tables 3.10 and 3.11.

3.4.2 Groundwater Sampling and Results

In addition to the soil borings, four groundwater-monitoring wells were installed (Figure 3.10). Between May and December 1998, three rounds of groundwater samples were collected from the four installed monitoring wells. Analytical results from the three rounds of sampling revealed the presence of chlorinated solvents associated with the regional TCE plume and sporadic detections of metals at low concentrations in each of the downgradient monitoring wells (W201, W202, and W203). Detections of these metals are believed to be associated with turbid water conditions due to low water levels and poor recovery in monitoring wells W201 and W203. These metals were not detected above RRS 1 in monitoring wells WITCTA019 and WITCTA035, which are located further downgradient of SWMU 29. The WITCTA wells were sampled during the investigation of oil/water separators (IT Corporation, 1998). It should be noted that only metals and halogenated VOC results are presented for monitoring wells WITCTA019, WITCTA022, WITCTA035, and WITCTA037, because these compounds were the only COPCs detected in groundwater downgradient of SWMU 29.

3.4.3 Phase II Soil Sampling and Results

Seven borings were advanced in January 1999 during Phase II of the investigation. The purpose of two borings (B229 and B230) was to confirm initial results and obtain soil samples for SPLP extraction and analysis. Additionally, five borings were installed to delineate known contaminants of concern. Cadmium, chromium and selenium were not confirmed, however, lead was confirmed and passed SPLP to establish the site-specific MSC of 44.4 mg/kg. PAHs were also confirmed at B229 and passed SPLP to establish site-specific MSCs for these compounds (Table 3.10). Heptachlor epoxide was not confirmed at B229; however, sample dilutions (due to dark colored extracts caused by PAHs) resulted in reporting limits above the original detected concentrations.

Analytical results from soil samples collected from boring B231 in December 1999 indicated that several inorganic analytes and organic compounds were present at concentrations greater than RRS 1. Antimony, barium, cadmium, chromium, lead, nickel, and zinc were detected above background values in the surface soil sample. Silver was detected above background in one subsurface soil sample collected from boring B231. Several pesticides and pesticide-related compounds including aldrin, DDD, DDE, 4,4'DDT (DDT), endrin aldehyde, endrin ketone, and heptachlor epoxide, were detected above MQLs and/or MSCs in the surface soil sample collected at boring B231. An MSC does not exist for endrin aldehyde and endrin ketone; therefore, an MSC will be calculated for these compounds. In addition, several PAHs (i.e., benzo[*a*]anthracene, chrysene, benzo[*b*]fluoranthene, benzo[*k*]fluoranthene, benzo[*a*]pyrene, indeno[1,2,3-*c,d*]pyrene, and dibenzo[*a,h*]anthracene), were detected above MQLs in the surface soil sample collected at boring B231. With the exception of dibenzo[*a,h*]anthracene, detections of these compounds are below alternative MSCs per previous SPLP results. Similarly, 3-methylcholanthrene, which is a PAH not reported under EPA Method SW8310, was detected above the MQL. A MSC does not exist for this compound, therefore, a MSC will be calculated. PAHs are considered to be ubiquitous in the

surface soil at SWMU 29 as the landfill is surrounded by asphalt roads and is also located near taxiways. In addition to PAHs detected in the surface soil sample collected from boring B231, phenanthrene was detected above the MQL in the soil sample collected from the 5-foot interval. Phenanthrene was also detected above MQL in subsurface soil samples collected from boring B201/B229, and was partially delineated by borings advanced in January 1999.

3.4.4 Phase III Soil Sampling and Results

Phase III sampling was performed in April 2000. Confirmation results from soil boring B234/ B201/B229 did not confirm 2-methylnaphthalene or heptachlor epoxide (with reporting limits slightly above the MSC). Dibenzo[*a,h*]anthracene was confirmed, however the SPLP sample extract was prepared for SW8270 versus being prepared for the more sensitive method SW8310. Therefore, the SPLP extract was not analyzed. Soil borings B237, B238, and B239 were successful in delineating COPCs to the west, southwest, and southeast of boring B201/B229. In addition, soil borings B237, B247 and B248 were successful in delineating COPCs to the west, northwest, and north of B231. However, results for antimony and cadmium were not reported. As SW6010 was run at B237, B247, and B248 in the surface interval, results for antimony and cadmium will be obtained from the laboratory.

3.4.5 Petroleum-Stained Soils Investigation

In May 1999, a soil gas survey was conducted to determine if the source of petroleum stained soils could be traced back to existing underground storage tanks near the site. The results of the soil vapor survey were inconclusive, but did show petroleum contamination only in locations near utility lines (HydroGeoLogic, 2000a). Figure 3.11 depicts the locations of underground utilities at SWMU 29. However, because the soil vapor survey did not provide a definitive source to the petroleum staining, additional soil borings were planned to confirm and delineate the petroleum contamination in the Phase III field effort.

As shown on Figure 3.11, a total of 15 borings, 3 of which are also replicated on Figure 3.9, were advanced to identify and delineate petroleum-stained soils. Soil samples were collected from the surface to the water table and screened with a PID. The soil sample with the highest PID reading and a soil sample just above the water table were analyzed using EPA Method SW8020 for VOCs, SW8310 for PAHs, and TX1005 for total petroleum hydrocarbons (TPH). Analytical results from this sampling revealed that neither benzene, toluene, ethylbenzene, total xylene, nor methyl tertiary butyl ether were detected at any sample interval. PAHs and TPH were detected at multiple depths at B236 and B241; however, concentrations do not indicate potential source areas. PAHs and TPH were also detected at multiple depths at B246 and B242 (located near a water utility in the area of B210 where a golden brown staining was first observed). Note that the petroleum staining confirmation borings B232/B205 and B234/B201 detected PAHs and TPH in the subsurface but did not detect PAHs or TPH at the water table. To the south of SWMU 29 PAHs at B243, B244, and B245 were detected at low concentrations just above the water table; however, TPH was only detected at B245. The remaining six borings (B233, B235, B238, B239, B240 and B247), were either non-detect or

had low concentrations of PAHs and TPH. Based on these results, it remains possible that a source area may be present in the landfill, or that a source may be migrating along utilities into the landfill, or both. Product identification (from existing chromatographic spectra) at these borings is planned to discern pockets of differing product types within the landfill.

3.4.6 Soil Sampling Results - SWMU 31

As depicted on Figure 3.12, the former waste accumulation area, SWMU 31, is located in the northern portion of SWMU 29. SWMU 31 managed wastes collected from operations within Buildings 1055 (Fire Control Shop) and 1050 (Pneudraulics Shop), from 1955 to 1990. It reportedly handled hydraulic fluids, solvents, methyl ethyl ketone (MEK), TCE, tetrachloroethene, and silicone damping fluid containing Freon 113. SWMU 31 was investigated in 1999 through 2000 as part of the RFI of waste accumulation areas across the former Carswell AFB (HydroGeoLogic, 1999). The detection of mercury in BHGLSWMU31002 at the Standard 2 concentration of 0.2 mg/kg was the only COPC identified in the subsurface during the investigation of SWMU 31. As no pattern of release from the ground surface could be discerned, the mercury detection has been attributed to landfill activities at SWMU 29. Therefore the detection of mercury in the 15-foot interval of BHGLSWMU31002 will be delineated along with other COPCs at SWMU 29. Analytical results from the SWMU 31 characterization sampling of surface soils (BHGLSWMU31001 and BHGLSWMU31002) revealed the presence of SVOCs, VOCs, and metals in surface soils. These surface soil COPCs were subsequently delineated by sample locations BHGLSWMU31004, BHGLSWMU31005, and BHGLSWMU31006. Note that the detections of COPCs at BHGLSWMU31002 were not confirmed at BHGLSWMU31003. SPLP extractions and analysis were also performed on barium, cadmium, chromium, lead, and mercury at BHGLSWMU31001. With the exception of lead, all of these metals passed SPLP to provide site specific MSCs for these elements at SWMU 31. Note that the site-specific MSCs achieved at SWMU 31 have been adopted for SWMU 29 as SWMU 31 is physically located within SWMU 29. These site-specific MSCs include barium (506 mg/kg), cadmium (1.5 mg/kg), chromium (40.6 mg/kg), and mercury (0.57 mg/kg). Under a separate project, an Interim Remedial Action is planned to remove lead contaminated surface soils and other COPCs at BHGLSWMU31001.

3.4.7 Proposed Sampling

Analytical results from soil samples collected at SWMU 29 (Landfill 2) indicate that additional sampling is required for confirmation/SPLP as well as delineation to background concentrations. Figure 3.9 depicts the eight proposed sampling locations. Note that proposed soil boring location B253 is replicated on both Figures 3.9 and 3.11. Confirmation/SPLP sampling will be performed at three soil borings to potentially provide site-specific MSCs: soil boring B251/B231 will be used to confirm detections of antimony, barium, cadmium, chromium, lead, aldrin, heptachlor epoxide, B2EHP, and dibenzo[*a,h*]anthracene at B231. Soil boring B252 will also be used to confirm the detection of dibenzo[*a,h*]anthracene at B232. Soil borings B254 and B256 will be used confirm detections of B2EHP at B206 and B204,

respectively. Soil borings B257 and B258 will be used to delineate mercury in the 15-foot interval to the north and west of BHGLSWMU31002. Soil boring B253 will be advanced in the central portion of the landfill to characterize and potentially separate areas of petroleum-stained soils encountered in the central, southern, and western portion of the landfill. Soil boring B255 will be used to delineate zinc in the surface to the south of B201, as well as PAHs and TPH to the south of B245.

3.5 SWMU 30/LANDFILL 9

3.5.1 Soil Characterization Sampling and Results

SWMU 30 (Landfill 9) was investigated by HydroGeoLogic between March and April 1998. During the investigation, a total of 25 soil borings were advanced, 5 of which were converted into piezometers to facilitate monitoring well placement. Soil samples were collected from three borings every 5 feet from the ground surface to the top of the water table and were analyzed for the full Appendix IX suite of analytes. A total of 12 Appendix IX soil samples were collected and analyzed. The remaining 22 soil borings were drilled for the purpose of delineating the boundaries of the landfill. As shown on Figure 3.13, the primary COPCs identified in soil above background levels during the soil characterization phase are barium, cadmium, lead, thallium, zinc, mercury, copper, chlordane, DDE, MEK, and several PAHS, including anthracene, benzo[*a*]anthracene, benzo[*a*]pyrene, benzo[*b*]fluoranthene, benzo[*g,h,i*]perylene, benzo[*k*]fluoranthene, chrysene, fluoranthene, indeno[1,2,3-*c,d*]pyrene, phenanthrene, and pyrene. Summaries of the SWMU 30 Standard 3 and Standard 2 issues are presented in Tables 3.12 and 3.13, respectively.

3.5.2 Groundwater Sampling and Results

In addition to the soil borings, eight monitoring wells were successfully installed between June 1998 and January 1999. Four rounds of groundwater samples were collected from these monitoring wells. The groundwater results are summarized in Figure 3.14, and discussed in detail in the Final Phase III RFI Work Plans (HydroGeoLogic, 2000a). As shown on Figure 3.14, the primary COPCs detected above their respective RRS 1 values during the four rounds of groundwater sampling were arsenic, antimony, cadmium, copper, nickel, silver, TCE, and B2EHP. It is important to note that antimony, cadmium, copper, nickel, and TCE were only detected in one well, W901, which was located upgradient of Landfill 9. In addition, the TCE detection should be considered anomalous and is most likely related to cross contamination from the sampling pump. Therefore, only arsenic, silver and B2EHP were detected in wells located within, or downgradient of, Landfill 9. Arsenic was detected at Standard 2 concentrations in the second and third of five groundwater sampling rounds at W904. Arsenic was also detected in three of four groundwater sampling rounds at W905. Silver was detected at a Standard 2 concentration in only the first of five groundwater sampling rounds at W904. B2EHP, which was sporadically detected at low concentrations in W902, W903, W904, W905, W952, W953, and W954, is considered a laboratory artifact and therefore will not be

further confirmed or delineated. An additional round of sampling to confirm arsenic at one well is proposed.

3.5.3 Phase II Soil Sampling and Results

During Phase II of the soil investigation, two soil borings were advanced with a hand auger to obtain soil samples for confirmation analyses and SPLP extraction. A summary of the results is presented on Figure 3.13. As shown on Figure 3.13, the primary COPCs identified for confirmation during the Phase II soil characterization were barium, cadmium, lead, chlordane, benzo[*a*]anthracene, benzo[*a*]pyrene, benzo[*b*]fluoranthene, benzo[*k*]fluoranthene, and indeno[1,2,3-*c,d*]pyrene. Only lead was detected above the groundwater MSC using the SPLP method.

3.5.4 Phase III Soil Sampling and Results

Phase III of the soil investigation was conducted at Landfill 9 in order to further delineate and conduct confirmation analyses and SPLP extraction for several COPCs. Eight borings were advanced for Phase III sample collection as depicted on Figure 3.13. The primary COPCs identified include barium, cadmium, lead, zinc, mercury, copper, chlordane, DDE, acenaphthene, acenaphthylene, anthracene, benzo[*a*]anthracene, benzo[*a*]pyrene, benzo[*b*]fluoranthene, benzo[*g,h,i*]perylene, benzo[*k*]fluoranthene, chrysene, dibenzo[*a,h*]anthracene, fluoranthene, flourene, indeno[1,2,3-*c,d*]pyrene, naphthalene, phenanthrene, and pyrene.

3.5.5 Proposed Sampling

An evaluation of Phase III analytical results indicates additional characterization and delineation is required. Six additional borings are proposed. Boring B942 will be located in the center of the eastern "lobe" to characterize this area using the Appendix IX analyte list for metals, pesticides/PCBs, VOCs, and SVOCs. Additional soil samples will be collected to delineate PAHs at B941; zinc at B938, B939, and B940; and zinc, chlordane, and DDE at B937.

3.6 SWMU 62/LANDFILL 6

3.6.1 Soil Characterization Sampling and Results

SWMU 62 (Landfill 6) was investigated by HydroGeoLogic between March and May 1998. Throughout the course of the investigation, 18 soil borings were drilled, 4 of which were converted into piezometers. In three of the borings, soil samples were collected every 5 feet from the ground surface to the top of the water table for Appendix IX analysis, resulting in a total of 12 Appendix IX samples. The remaining 14 soil borings were drilled for the purpose of delineating the boundaries of the landfill. As shown on Figure 3.15, the primary COPCs identified during the Landfill 6 characterization soil investigation include the inorganic

compounds antimony, barium, beryllium, chromium, lead, nickel, selenium, thallium, vanadium, and zinc; the organic compounds chlordane, dieldrin, DDE, DDT, acetone, methyl ethyl ketone (2-butanone), B2EHP; the PAH compounds benzo[*a*]anthracene, benzo[*a*]pyrene, benzo[*b*]fluoranthene, chrysene, fluoranthene, indeno[1,2,3-*c,d*]pyrene, phenanthrene, and pyrene; and sulfide. Summaries of the SWMU 62 Standard 3 and Standard 2 issues are presented in Tables 3.14 and 3.15.

3.6.2 Groundwater Sampling and Results

In addition to the soil borings, four monitoring wells were installed. Between May and December 1998, three rounds of groundwater samples were collected from the four installed monitoring wells. These results are summarized in Figure 3.16, and discussed in detail in the Final Phase III RFI Work Plans (HydroGeoLogic, 2000a). As shown on Figure 3.16, manganese was the only inorganic analyte detected above RRS 1 in groundwater from the four monitoring wells associated with the landfill. Manganese detections were limited to monitoring wells W602 and W603. Because concentrations of manganese are low and manganese is not an Appendix IX analyte, further consideration of this analyte is not warranted.

Several organic compounds were detected at concentrations above the MQL in groundwater from the four monitoring wells associated with Landfill 6. The detected organic compounds from the four wells, including *cis*-1,2-dichloroethene, *trans*-1,2-dichloroethene, TCE, chloroform, and vinyl chloride, are associated with the regional TCE plume. Note that B2EHP was detected in the December 1998 groundwater sample collected from the upgradient monitoring well, W604. This isolated detection is considered to be a laboratory artifact. Therefore, no additional groundwater sampling for organic analytes at SWMU 62 is recommended.

3.6.3 Phase II Sampling and Results

In January 1999, seven soil borings were advanced during Phase II of the soil investigation. Three borings were advanced to confirm initial results and obtain soil samples for SPLP extraction, and four borings were advanced to delineate known contaminants of concern. A summary of the results is presented in Figure 3.15. As shown on Figure 3.15, the primary COPCs detected were selenium in B619; selenium, chlordane, and dieldrin in B620; selenium in B621; selenium, chlordane, and dieldrin in B622; lead, chlordane, dieldrin in B623; antimony, beryllium, chromium, and selenium in B624; and lead, pyrene, benzo[*a*]anthracene, benzo[*a*]pyrene, benzo[*b*]fluoranthene, and indeno[1,2,3-*cd*]pyrene in B625. During the second round of the soil investigation, soil samples were also collected from borings B623 and B625 for confirmation analysis and SPLP extraction. However, higher confirmation results could not be obtained for chlordane and dieldrin, and the initial detections of PAHs could not be confirmed. Therefore, analytical results from soil samples collected at SWMU 62 (Landfill 6) indicated that a third round of sampling was required for delineation to background concentrations.

3.6.4 Phase III Sampling and Results

During Phase III sampling, six borings were advanced and sampled for confirmation analysis and SPLP extraction as depicted on Figure 3.15. The Phase III soil investigation results include detections of lead (including SPLP lead) and zinc; the organic compounds chlordane, dieldrin, and DDT; and the PAH compounds (including SPLP PAHs) acenaphthene, acenaphthylene, anthracene, benzo[*a*]anthracene, benzo[*a*]pyrene, benzo[*b*]fluoranthene, benzo[*g,h,i*]perylene, benzo[*k*]fluoranthene, chrysene, dibenzo[*a,h*]anthracene, fluoranthene, fluorene, indeno[1,2,3-*c,d*]pyrene, naphthalene, phenanthrene, and pyrene.

Soil borings B632 and B633 were advanced adjacent to the former location of borings B615/B625 and B605/B623, respectively, to obtain soil samples for confirmation analysis and SPLP extraction. Phase III soil samples collected from B632 and B633 contained several detections of pesticides and PAHs. Boring B627 was advanced north of Landfill 6, and boring B628 was advanced east of Landfill 6 to delineate contaminants of concern. B627 contained lead, zinc, and several PAHs. B628 contained lead, zinc, several pesticides, and several PAHs. Based on results from soil samples previously collected from boring B626, additional borings were advanced south (B629) and west (B630) of Landfill 6 to delineate the southern and western extent of Landfill 6. B629 contained DDT and B630 contained lead, DDT, and several PAHs.

3.6.5 Proposed Sampling

Analytical results from Phase III sampling indicate that additional delineation and confirmation/SPLP sampling is required from seven additional borings, which will be advanced during the next round of sampling. As presented on Figure 3.15, confirmation/SPLP soil samples will be collected and analyzed from B634 for antimony, and from B638 for dieldrin and B2EHP. Delineation soil samples will be collected from B635 for lead, zinc, and PAHs; from B636 for lead, zinc, and PAHs; from B637 for lead, zinc, chlordane, dieldrin, and PAHs; from B639 for antimony, nickel, and vanadium; and from B640 for antimony, nickel, vanadium, and lead.

663 19

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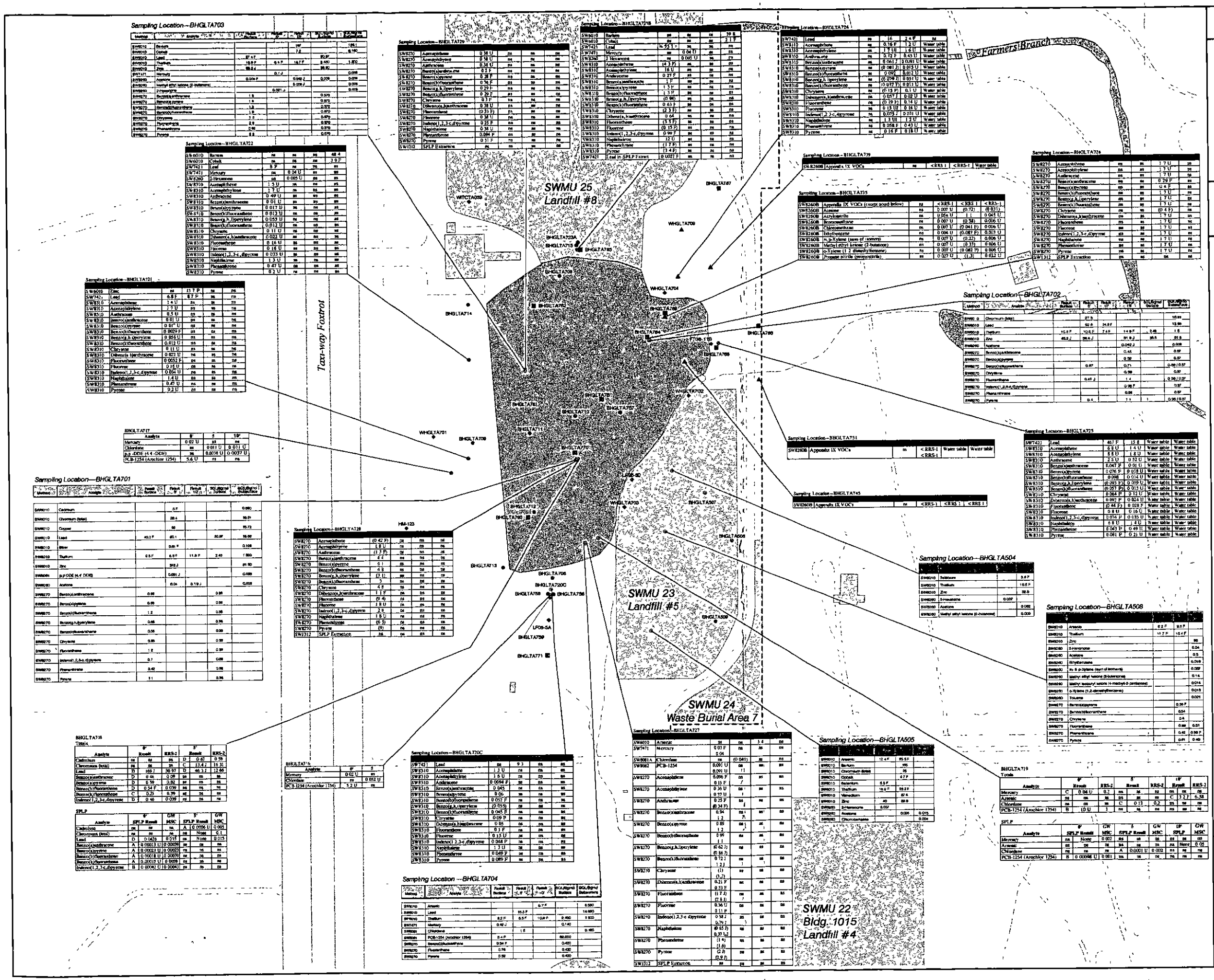
FIGURES



HydroGeoLogic, Inc — Phase III Work Plans Addendum
NAS Fort Worth JRB, Texas

Figure 3.1

SWMU 17 / Landfill 7 Analytical Results in Soil

U S Air Force Center
For Environmental Excellence

Legend

- NAS Fort Worth JRB Boundary
- Landfill Boundaries
- Existing Borehole Location (Lithology)
- Existing Borehole Location (Chemical Analysis)
- Existing Monitoring Well Location
- Piezometer Location
- Proposed Borehole Location
- Proposed Piezometer Location

Notes
Concentrations reported in mg/kg
MSC—Medium-Specific Concentration
SPLP—Synthetic Precipitation Leaching Procedure
A—Non detect or detection below SQL/Bgrnd
B—Non detect Adjusted Sample Quantitation Limit above MSC
C—Detection below MSC
D—Detection above MSC
ns—not sampled
na—not analyzed
tbd—to be decided
Red—Above MSC
SQL/Bgrnd—Adjusted Sample Quantitation Limit/Background
MQL—Method Quantitation Limit
x—Proposed Sampling

Phase I Results (header) Concentration above background or MQL
Phase II Analyses or Results (header) Concentration above background or MQL
Phase III Analyses or Results (header) All results, detects and non-detects
SWMU 23 / Landfill 5 Results (header) Concentrations above background or MQL
Proposed Sampling Locations (header)
Analyte detected above MSC in soil, but detected below MSC in SPI P extract.

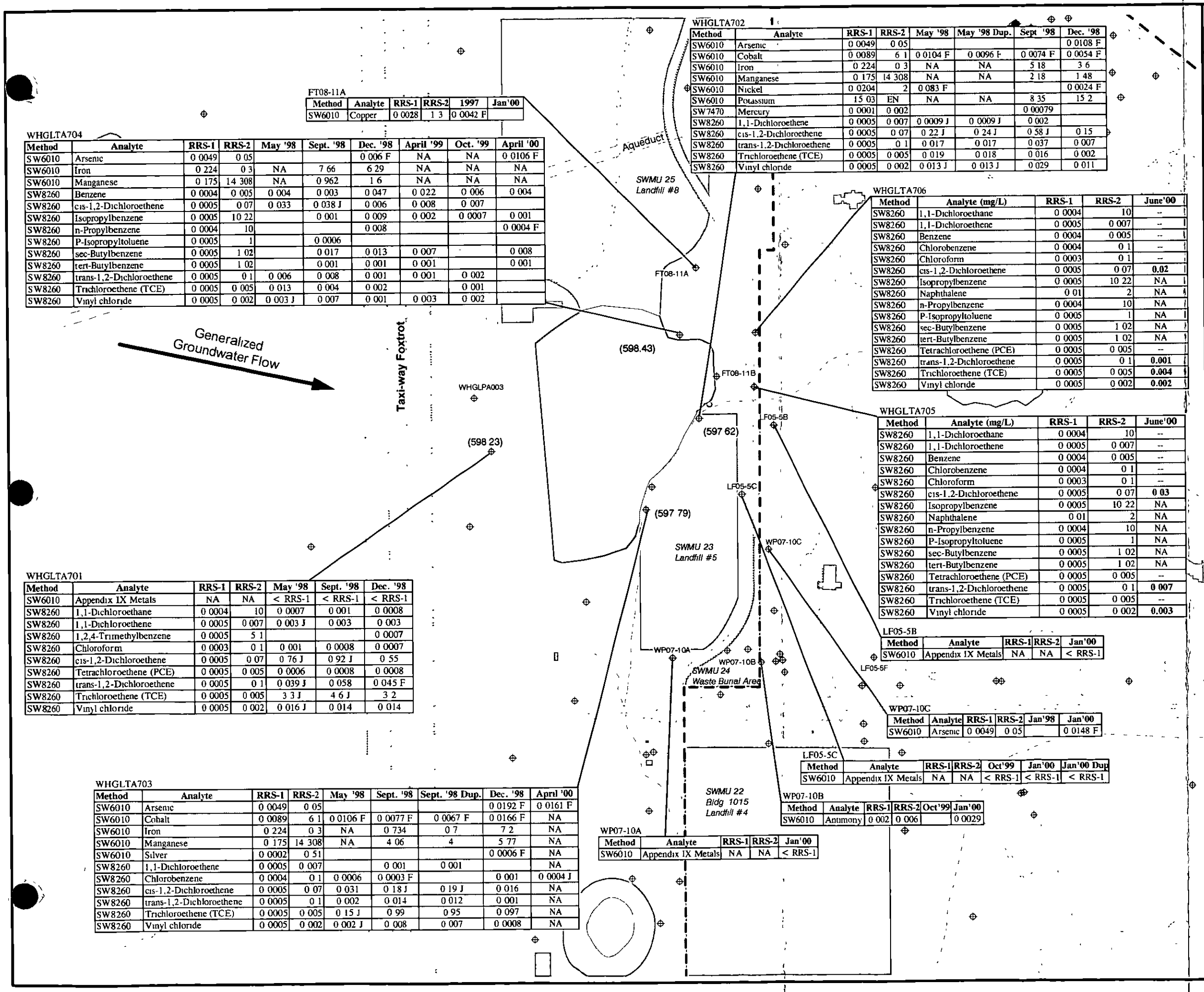
Phase I Results - Only detections above RRS-1 are reported on the figure
Phase II and III Results - All results are reported Analytes depicted in (parentheses) exceed RRS-1 but are below MSC

N

100 0 100 200
SCALE IN FEET

HYDRO GeoLogic INC

Filename X:\Afc001\33cab\Report\Phase III Work Plan Addendum\landfill 7.apr
Project AFC001-33CAB
Created 09/25/00 jbelcher
Revised 01/18/01 cf
Source HydroGeoLogic, Inc—GIS Database



FT08-11A

Method	Analyte	RRS-1	RRS-2	1997	Jan'00
SW6010	Copper	0 0028	1 3	0 0042 F	

WHGLTA704

Method	Analyte	RRS-1	RRS-2	May '98	Sept. '98	Dec. '98	April '99	Oct. '99	April '00
SW6010	Arsenic	0 0049	0 05			0 006 F	NA	NA	0 0106 F
SW6010	Iron	0 224	0 3	NA	7 66	6 29	NA	NA	NA
SW6010	Manganese	0 175	14 308	NA	0 962	1 6	NA	NA	NA
SW8260	Benzene	0 0004	0 005	0 004	0 003	0 047	0 022	0 006	0 004
SW8260	cis-1,2-Dichloroethene	0 0005	0 07	0 033	0 038 J	0 006	0 008	0 007	
SW8260	Isopropylbenzene	0 0005	10 22		0 001	0 009	0 002	0 0007	0 001
SW8260	n-Propylbenzene	0 0004	10			0 008			0 0004 F
SW8260	P-Isopropyltoluene	0 0005	1		0 0006				
SW8260	sec-Butylbenzene	0 0005	1 02		0 017	0 013	0 007		0 008
SW8260	tert-Butylbenzene	0 0005	1 02		0 001	0 001	0 001		0 001
SW8260	trans-1,2-Dichloroethene	0 0005	0 1	0 006	0 008	0 001	0 001	0 002	
SW8260	Trichloroethene (TCE)	0 0005	0 005	0 013	0 004	0 002		0 001	
SW8260	Vinyl chloride	0 0005	0 002	0 003 J	0 007	0 001	0 003	0 002	

WHGLTA702

Method	Analyte	RRS-1	RRS-2	May '98	May '98 Dup.	Sept '98	Dec. '98
SW6010	Arsenic	0 0049	0 05				0 0108 F
SW6010	Cobalt	0 0089	6 1	0 0104 F	0 0096 F	0 0074 F	0 0054 F
SW6010	Iron	0 224	0 3	NA	NA	5 18	3 6
SW6010	Manganese	0 175	14 308	NA	NA	2 18	1 48
SW6010	Nickel	0 0204	2	0 083 F			0 0024 F
SW6010	Potassium	15 03	EN	NA	NA	8 35	15 2
SW7470	Mercury	0 0001	0 002			0 00079	
SW8260	1,1-Dichloroethene	0 0005	0 007	0 0009 J	0 0009 J	0 002	
SW8260	cis-1,2-Dichloroethene	0 0005	0 07	0 22 J	0 24 J	0 58 J	0 15
SW8260	trans-1,2-Dichloroethene	0 0005	0 1	0 017	0 017	0 037	0 007
SW8260	Trichloroethene (TCE)	0 0005	0 005	0 019	0 018	0 016	0 002
SW8260	Vinyl chloride	0 0005	0 002	0 013 J	0 013 J	0 029	0 011

WHGLTA706

Method	Analyte (mg/L)	RRS-1	RRS-2	June'00
SW8260	1,1-Dichloroethane	0 0004	10	--
SW8260	1,1-Dichloroethene	0 0005	0 007	--
SW8260	Benzene	0 0004	0 005	--
SW8260	Chlorobenzene	0 0004	0 1	--
SW8260	Chloroform	0 0003	0 1	--
SW8260	cis-1,2-Dichloroethene	0 0005	0 07	**0.02**
SW8260	Isopropylbenzene	0 0005	10 22	NA
SW8260	Naphthalene	0 01	2	NA
SW8260	n-Propylbenzene	0 0004	10	NA
SW8260	P-Isopropyltoluene	0 0005	1	NA
SW8260	sec-Butylbenzene	0 0005	1 02	NA
SW8260	tert-Butylbenzene	0 0005	1 02	NA
SW8260	Tetrachloroethene (PCE)	0 0005	0 005	--
SW8260	trans-1,2-Dichloroethene	0 0005	0 1	**0.001**
SW8260	Trichloroethene (TCE)	0 0005	0 005	**0.004**
SW8260	Vinyl chloride	0 0005	0 002	**0.002**

WHGLTA705

Method	Analyte (mg/L)	RRS-1	RRS-2	June'00
SW8260	1,1-Dichloroethane	0 0004	10	--
SW8260	1,1-Dichloroethene	0 0005	0 007	--
SW8260	Benzene	0 0004	0 005	--
SW8260	Chlorobenzene	0 0004	0 1	--
SW8260	Chloroform	0 0003	0 1	--
SW8260	cis-1,2-Dichloroethene	0 0005	0 07	**0 03**
SW8260	Isopropylbenzene	0 0005	10 22	NA
SW8260	Naphthalene	0 01	2	NA
SW8260	n-Propylbenzene	0 0004	10	NA
SW8260	P-Isopropyltoluene	0 0005	1	NA
SW8260	sec-Butylbenzene	0 0005	1 02	NA
SW8260	tert-Butylbenzene	0 0005	1 02	NA
SW8260	Tetrachloroethene (PCE)	0 0005	0 005	--
SW8260	trans-1,2-Dichloroethene	0 0005	0 1	**0 007**
SW8260	Trichloroethene (TCE)	0 0005	0 005	--
SW8260	Vinyl chloride	0 0005	0 002	**0.003**

WHGLTA701

Method	Analyte	RRS-1	RRS-2	May '98	Sept. '98	Dec. '98
SW6010	Appendix IX Metals	NA	NA	< RRS-1	< RRS-1	< RRS-1
SW8260	1,1-Dichloroethane	0 0004	10	0 0007	0 001	0 0008
SW8260	1,1-Dichloroethene	0 0005	0 007	0 003 J	0 003	0 003
SW8260	1,2,4-Trimethylbenzene	0 0005	5 1			0 0007
SW8260	Chloroform	0 0003	0 1	0 001	0 0008	0 0007
SW8260	cis-1,2-Dichloroethene	0 0005	0 07	0 76 J	0 92 J	0 55
SW8260	Tetrachloroethene (PCE)	0 0005	0 005	0 0006	0 0008	0 0008
SW8260	trans-1,2-Dichloroethene	0 0005	0 1	0 039 J	0 058	0 045 F
SW8260	Trichloroethene (TCE)	0 0005	0 005	3 3 J	4 6 J	3 2
SW8260	Vinyl chloride	0 0005	0 002	0 016 J	0 014	0 014

LF05-5B

Method	Analyte	RRS-1	RRS-2	Jan'00
SW6010	Appendix IX Metals	NA	NA	< RRS-1

WP07-10C

Method	Analyte	RRS-1	RRS-2	Jan'98	Jan'00
SW6010	Arsenic	0 0049	0 05		0 0148 F

LF05-5C

Method	Analyte	RRS-1	RRS-2	Oct'99	Jan'00	Jan'00 Dup
SW6010	Appendix IX Metals	NA	NA	< RRS-1	< RRS-1	< RRS-1

WP07-10B

Method	Analyte	RRS-1	RRS-2	Oct'99	Jan'00
SW6010	Antimony	0 002	0 006		0 0029

WP07-10A

Method	Analyte	RRS-1	RRS-2	Jan'00
SW6010	Appendix IX Metals	NA	NA	< RRS-1

WHGLTA703

Method	Analyte	RRS-1	RRS-2	May '98	Sept. '98	Sept. '98 Dup.	Dec. '98	April '00
SW6010	Arsenic	0 0049	0 05				0 0192 F	0 0161 F
SW6010	Cobalt	0 0089	6 1	0 0106 F	0 0077 F	0 0067 F	0 0166 F	NA
SW6010	Iron	0 224	0 3	NA	0 734	0 7	7 2	NA
SW6010	Manganese	0 175	14 308	NA	4 06	4	5 77	NA
SW6010	Silver	0 0002	0 51				0 0006 F	NA
SW8260	1,1-Dichloroethene	0 0005	0 007		0 001	0 001		NA
SW8260	Chlorobenzene	0 0004	0 1	0 0006	0 0003 F		0 001	0 0004 J
SW8260	cis-1,2-Dichloroethene	0 0005	0 07	0 031	0 18 J	0 19 J	0 016	NA
SW8260	trans-1,2-Dichloroethene	0 0005	0 1	0 002	0 014	0 012	0 001	NA
SW8260	Trichloroethene (TCE)	0 0005	0 005	0 15 J	0 99	0 95	0 097	NA
SW8260	Vinyl chloride	0 0005	0 002	0 002 J	0 008	0 007	0 0008	NA

HydroGeoLogic, Inc —Phase III Work Plans Addendum
NAS Fort Worth JRB, Texas

Figure 3.2
SWMU 17 / Landfill 7
Analytical Results in Groundwater
May 1998 - June 2000

U.S. Air Force Center for Environmental Excellence

Legend

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

——— Former Carswell Air Force Base

Landfill Boundaries

WHGLTA201 (587 57) Sampling Location (Groundwater Elevation)

GMI-22-07M Existing Monitoring Well Location

NOTES:
Concentrations reported in mg/L.
RRS-1—Risk Reduction Standard 1
RRS-2—Risk Reduction Standard 2
NA—Not applicable No TNRCC RRS-2 value or not analyzed.
NS—Not sampled for this analyte.
Elevations reported in feet above mean sea level as of December 1998

Detection > RRS-2

All groundwater analytical concentrations presented on figure are greater than RRS-1 Yellow highlighting indicates concentrations greater than RRS-2

N

125 0 125 250
SCALE IN FEET

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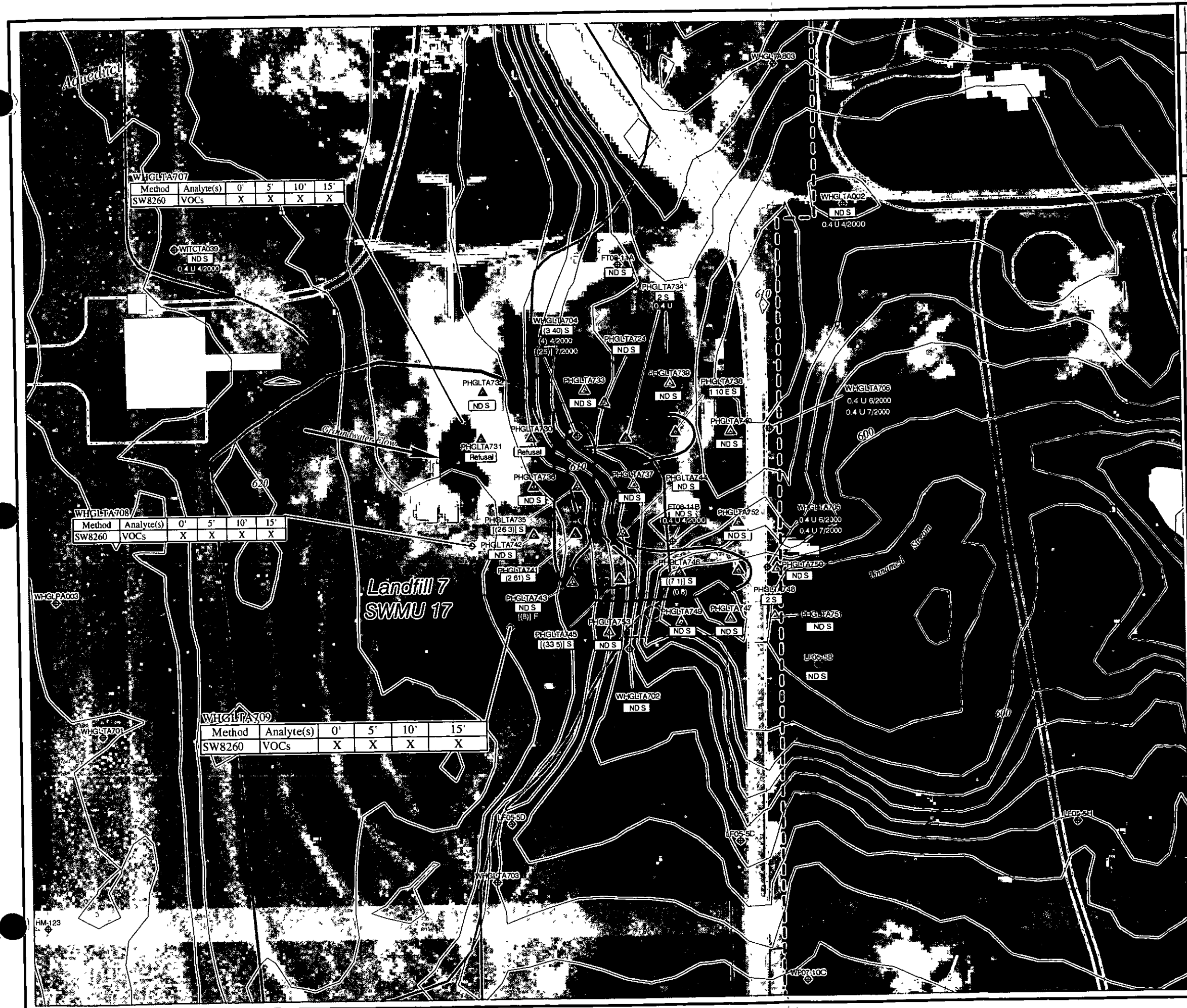
Project AFC001-33CAB
Created 09/25/00 jbelcher
Revised 01/18/01 cf
Map Source HydroGeoLogic, Inc
ArcView GIS Database 2000

HYDRO GeoLogic INC



HydroGeoLogic, Inc —Phase III Work Plans Addendum
NAS Fort Worth JRB, Texas

Figure 3.3
SWMU 17 / Landfill 7

Expedited Site Characterization
Delineation of Benzene in Groundwater
Analytical Results and Proposed Sampling Locations

U.S. Air Force Center for Environmental Excellence

Legend

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

—600— Ground Elevation Contour (ft msl)
(Contour Interval 2 ft)

—10— Benzene Contour (ppb)

Landfill Boundaries

▲ Piezometer Location
(Visual Observations Do Not Suggest Contamination)

▲ Piezometer Location
(Visual Observations Do Suggest Contamination)

Monitoring Well Location

Proposed Monitoring Well Location

Notes
Results depicted in redtext associated with mobile laboratory
Results depicted in white text associated with fixed-base laboratory.

Proposed Sampling Locations(header)

N

50 0 50 100 150
SCALE IN FEET

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Project AFC001-33CAB
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Revised 01/18/01 cf
Map Source HydroGeoLogic, Inc
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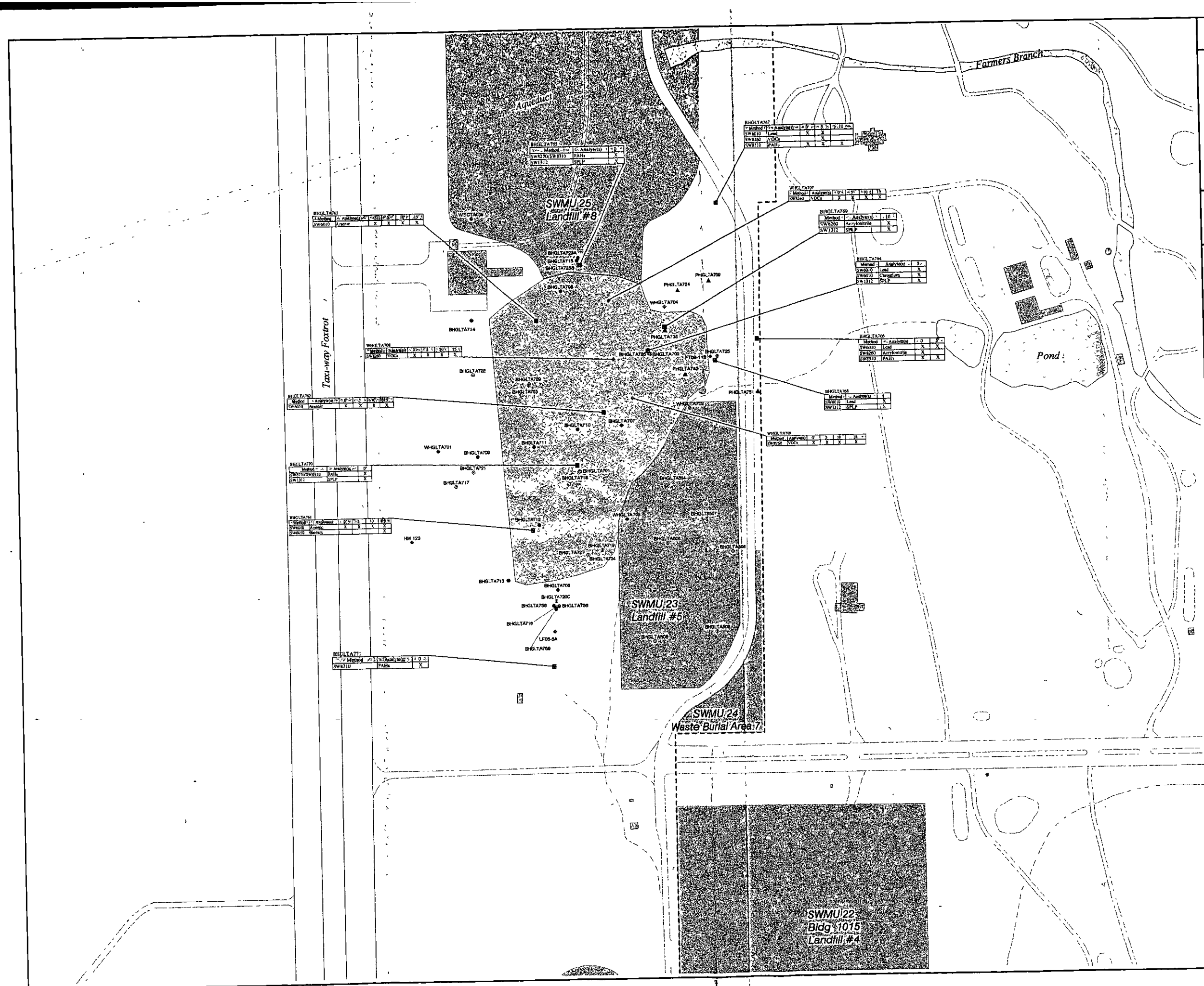
HYDRO GeoLogic INC



HydroGeologic, Inc — Phase III Work Plans Addendum
NAS Fort Worth JRB, Texas

Figure 3.4

SWMU 17 / Landfill 7
Proposed Soil Sampling Locations

U.S. Air Force Center
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Legend

- NAS Fort Worth JRB Boundary
- Landfill Boundaries
- Existing Borehole Location (Lithology)
- Existing Borehole Location (Chemical Analysis)
- Existing Monitoring Well Location
- Piezometer Location
- Proposed Borehole Location
- Proposed Monitoring Well Location

Notes
SPLP—Synthetic Precipitation Leaching Procedure
x—Proposed Sampling

Proposed Sampling Locations (header)

N

100 0 100 200
SCALE IN FEET

HYDRO GeoLogic INC

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Project AFC001-33CAB
Created 09/25/00 jbelcher
Revised 01/18/01 cf
Source HydroGeologic, Inc—GIS Database

Figure 3.5

SWMU 26 / Landfill 3 Analytical Results in Soil and Proposed Sampling

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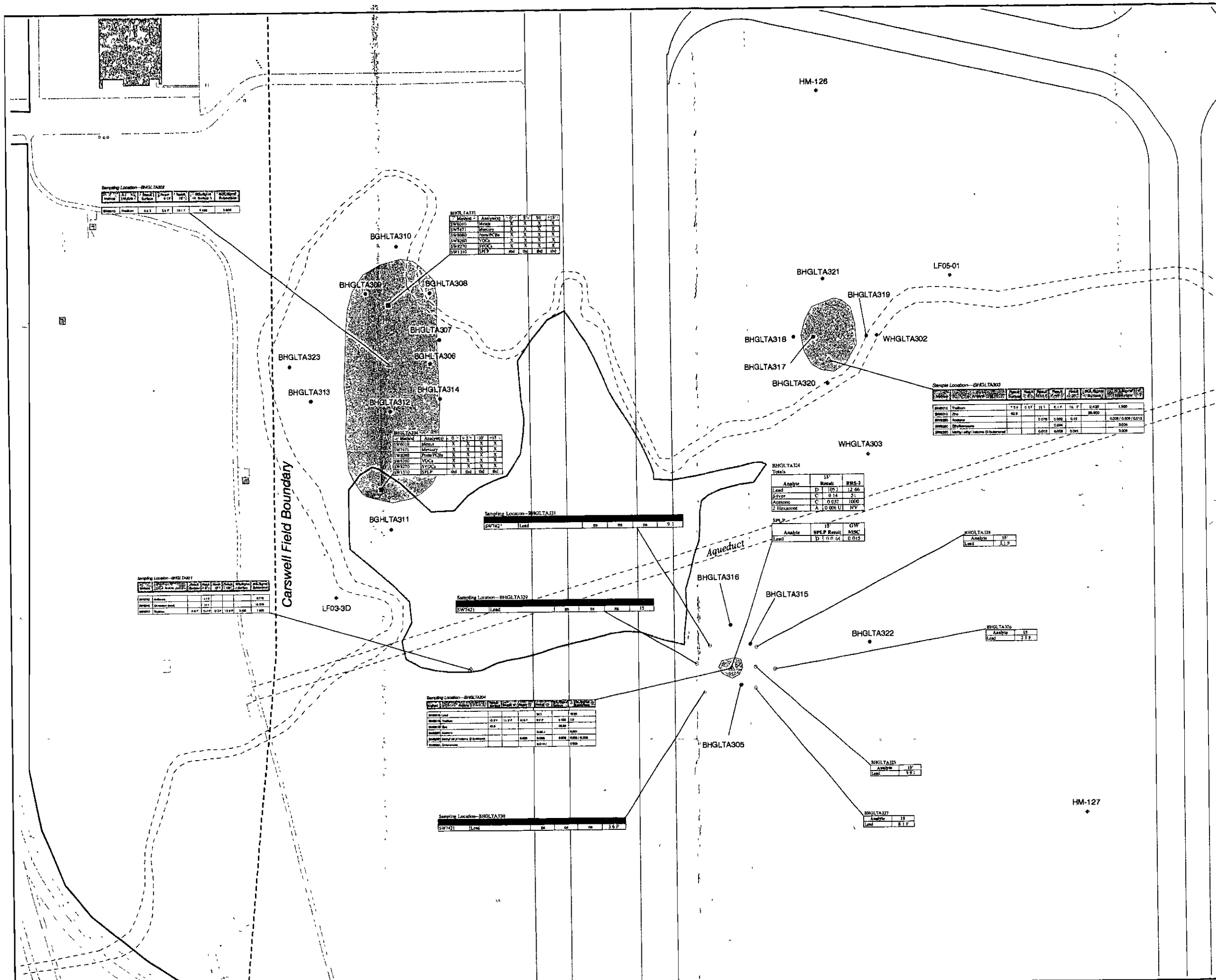

Legend

- NAS Fort Worth JRB Boundary
- Landfill Boundaries
- Photo-identified Suspect Area (Based on December 31, 1950 Aerial Photograph)
- Former Outline of Farmers Branch Creek (1950)
- Proposed Soil Boring
- Existing Borehole Location (Lithology)
- Existing Borehole Location (Chemical Analysis)
- Existing Borehole/Piezometer Location (Chemical Analysis)
- Existing Monitoring Well Location

Notes
Concentrations reported in mg/kg
MSC—Medium-Specific Concentration
SPLP—Synthetic Precipitation Leaching Procedure
A—Non detect or detection below SQL/Bgrnd
B—Non detect Adjusted Sample Quantitation Limit above MSC
C—Detection below MSC
D—Detection above MSC
ns—not sampled
na—not analyzed
tbd—to be decided
Red—Above MSC
SQL/Bgrnd—Adjusted Sample Quantitation Limit/Background
MQL—Method Quantitation Limit
br—bedrock
Phase I Results - Only detections above RRS-1 are reported on the figure All Phase I samples analyzed for the full suite of Appendix IX compounds
Phase II and III Results - All results are reported Analytes depicted in (parentheses) exceed RRS-1 but are below MSC

- Phase I Results (header)
- Phase II Analyses or Results (header)
- Phase III Analyses or Results (header)
- Proposed Sampling Locations (header)
- Analyte detected above MSC in soil and in SPLP extract

N

100 0 100 200
SCALE IN FEET

HYDRO GeoLogic INC

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Project AFC001-33CAB
Created 09/22/00 jbelcher
Revised 01/18/01 cf
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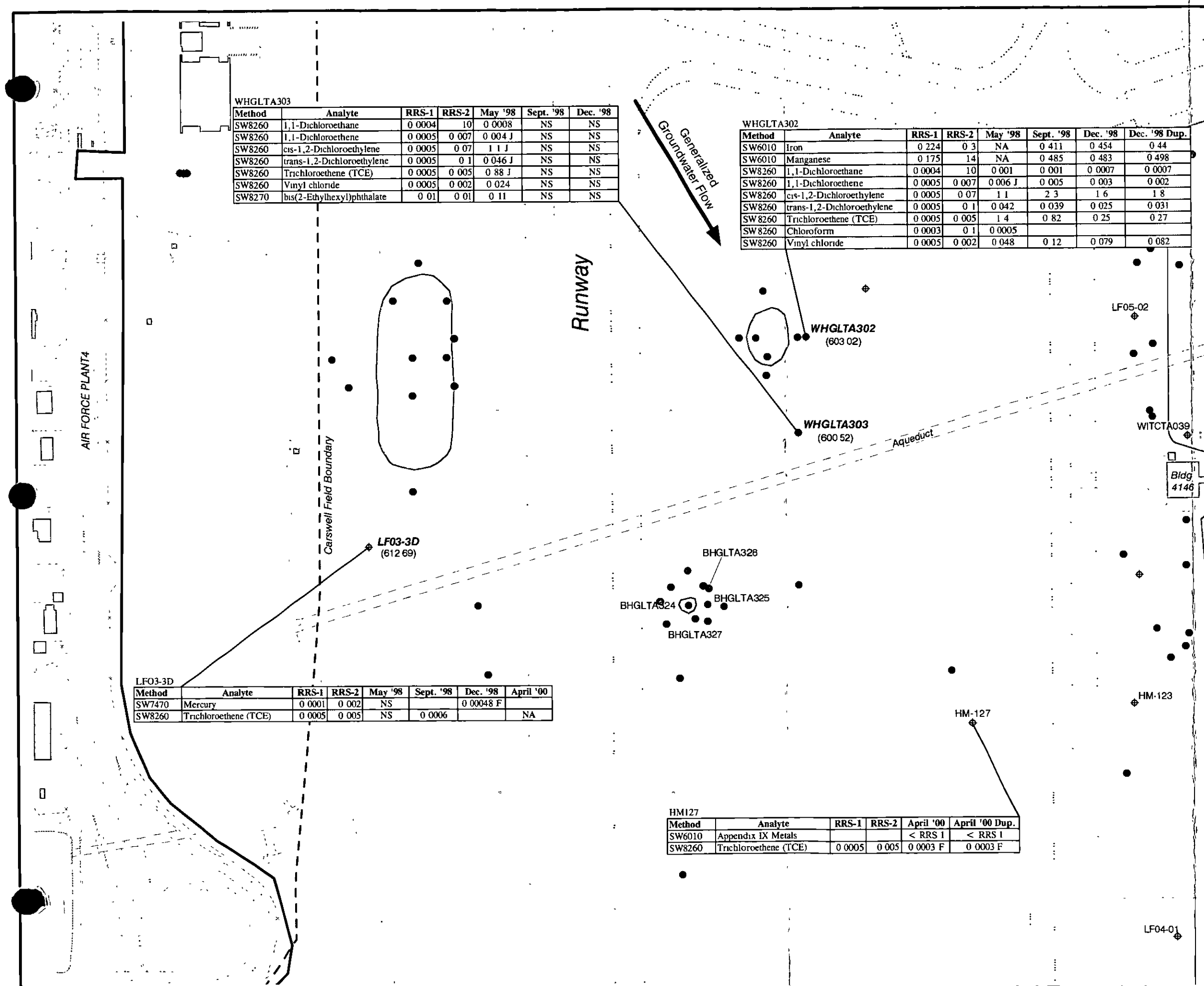

WHGLTA303

Method	Analyte	RRS-1	RRS-2	May '98	Sept. '98	Dec. '98
SW8260	1,1-Dichloroethane	0 0004	10	0 0008	NS	NS
SW8260	1,1-Dichloroethene	0 0005	0 007	0 004 J	NS	NS
SW8260	cis-1,2-Dichloroethylene	0 0005	0 07	1 1 J	NS	NS
SW8260	trans-1,2-Dichloroethylene	0 0005	0 1	0 046 J	NS	NS
SW8260	Trichloroethene (TCE)	0 0005	0 005	0 88 J	NS	NS
SW8260	Vinyl chloride	0 0005	0 002	0 024	NS	NS
SW8270	bis(2-Ethylhexyl)phthalate	0 01	0 01	0 11	NS	NS

WHGLTA302

Method	Analyte	RRS-1	RRS-2	May '98	Sept. '98	Dec. '98	Dec. '98 Dup.
SW6010	Iron	0 224	0 3	NA	0 411	0 454	0 44
SW6010	Manganese	0 175	14	NA	0 485	0 483	0 498
SW8260	1,1-Dichloroethane	0 0004	10	0 001	0 001	0 0007	0 0007
SW8260	1,1-Dichloroethene	0 0005	0 007	0 006 J	0 005	0 003	0 002
SW8260	cis-1,2-Dichloroethylene	0 0005	0 07	1 1	2 3	1 6	1 8
SW8260	trans-1,2-Dichloroethylene	0 0005	0 1	0 042	0 039	0 025	0 031
SW8260	Trichloroethene (TCE)	0 0005	0 005	1 4	0 82	0 25	0 27
SW8260	Chloroform	0 0003	0 1	0 0005			
SW8260	Vinyl chloride	0 0005	0 002	0 048	0 12	0 079	0 082

LF03-3D

Method	Analyte	RRS-1	RRS-2	May '98	Sept. '98	Dec. '98	April '00
SW7470	Mercury	0 0001	0 002	NS		0 00048 F	
SW8260	Trichloroethene (TCE)	0 0005	0 005	NS	0 0006		NA

HM127

Method	Analyte	RRS-1	RRS-2	April '00	April '00 Dup.
SW6010	Appendix IX Metals			< RRS 1	< RRS 1
SW8260	Trichloroethene (TCE)	0 0005	0 005	0 0003 F	0 0003 F

HydroGeoLogic, Inc —Phase III Work Plans Addendum
NAS Fort Worth JRB, Texas

Figure 3.6
SWMU 26 / Landfill 3

Analytical Results in Groundwater
May 1998 - April 2000

U.S. Air Force Center for Environmental Excellence

Legend

- NAS Fort Worth JRB (Carswell Field)
- Former Carswell Air Force Base
- Landfill Boundaries
- WHGLTA201 (587 57) — Sampling Location (Groundwater Elevation)
- GMI-22-07M — Existing Monitoring Well Location
- BHGLTA211 — Existing Borehole Location

NOTES:
Concentrations reported in mg/L
RRS-1—Risk Reduction Standard 1
RRS-2—Risk Reduction Standard 2.
NA—Not applicable No TNRCC RRS-2 value
Elevations reported in feet above mean sea level.

Detection > RRS-2

N

125 0 125 250
SCALE IN FEET

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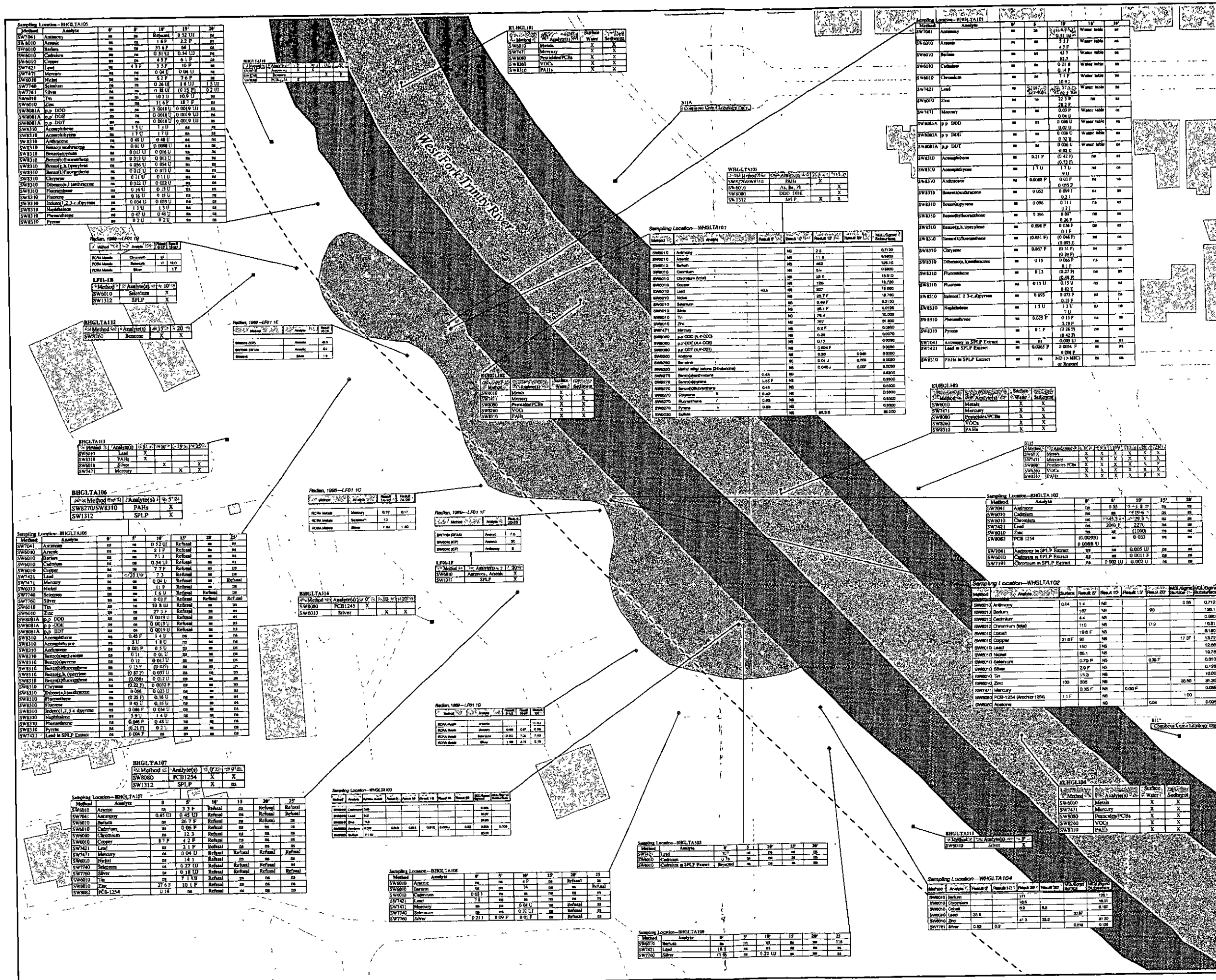
HYDRO GeoLogic INC



HydroGeoLogic, Inc — Phase III Work Plans Addendum
NAS Fort Worth JRB, Texas

Figure 3.7

SWMU 28 / Landfill 1 Analytical Results in Soil, Radian Soil Data, and Proposed Sampling

U.S. Air Force Center
For Environmental Excellence

Legend

- NAS Fort Worth JRB Boundary
- Landfill Boundaries
- Rip-rap
- Existing Borehole Location (Chemical Analysis)
- Proposed Sampling Location
- Existing Monitoring Well Location
- Surface Water/Sediment Sampling Location

Notes
Concentrations reported in mg/kg
MSC—Medium-Specific Concentration
SPLP—Synthetic Precipitation Leaching Procedure
na—not sampled
na—not analyzed
tbd—to be decided
Red—Above MSC
MQL/Bgnd—Method Quantitation Limit/Background
x—Proposed Sampling
Phase I Results - Only detections above RRS-1 are reported on the figure
Phase II and III Results - All results are reported. Analytes depicted in (parentheses) exceed RRS-1 but are below MSC

- Round I Results (header)
- Round II Analyses or Results (header)
- Proposed Sampling Locations (header)
- Analyte detected above MSC in soil, but detected below MSC in SPLP extract

N

50 0 50 100
SCALE IN FEET

HYDRO GeoLogic INC.

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Revised 01/18/01 cf
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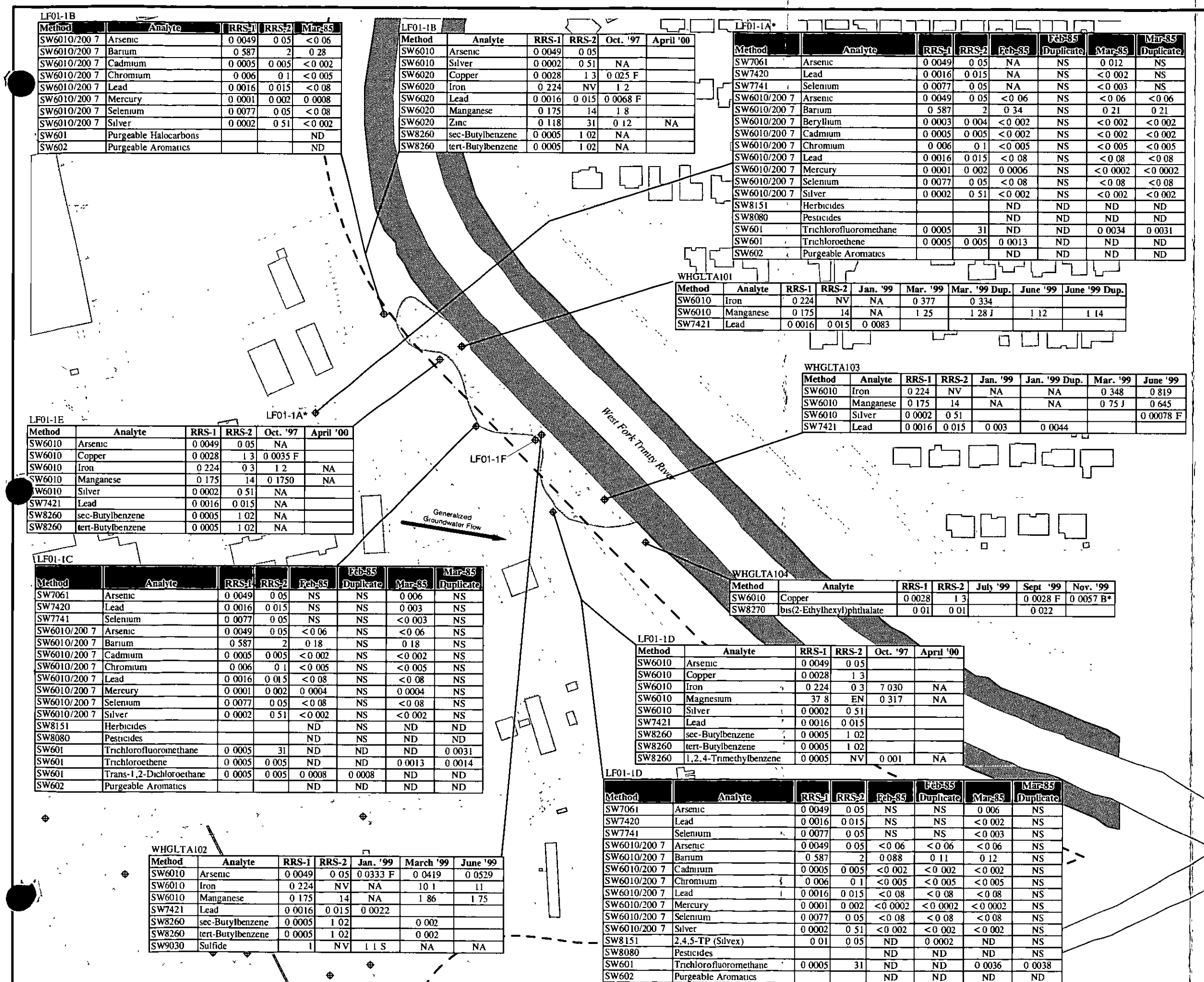

LF01-1B

Method	Analyte	RRS-1	RRS-2	Mar-85
SW6010/200 7	Arsenic	0 0049	0 05	< 0 06
SW6010/200 7	Barium	0 587	2	0 28
SW6010/200 7	Cadmium	0 0005	0 005	< 0 002
SW6010/200 7	Chromium	0 006	0 1	< 0 005
SW6010/200 7	Lead	0 0016	0 015	< 0 08
SW6010/200 7	Mercury	0 0001	0 002	0 0008
SW6010/200 7	Selenium	0 0077	0 05	< 0 08
SW6010/200 7	Silver	0 0002	0 51	< 0 002
SW601	Purgeable Halocarbons			ND
SW602	Purgeable Aromatics			ND

LF01-1B

Method	Analyte	RRS-1	RRS-2	Oct. '97	April '00
SW6010	Arsenic	0 0049	0 05		
SW6010	Silver	0 0002	0 51	NA	
SW6020	Copper	0 0028	1 3	0 025 F	
SW6020	Iron	0 224	NV	1 2	
SW6020	Lead	0 0016	0 015	0 0068 F	
SW6020	Manganese	0 175	14	1 8	
SW6020	Zinc	0 118	31	0 12	NA
SW8260	sec-Butylbenzene	0 0005	1 02	NA	
SW8260	tert-Butylbenzene	0 0005	1 02	NA	

LF01-1A*

Method	Analyte	RRS-1	RRS-2	Feb-85	Feb-85 Duplicate	Mar-85	Mar-85 Duplicate
SW7061	Arsenic	0 0049	0 05	NA	NS	0 012	NS
SW7420	Lead	0 0016	0 015	NA	NS	< 0 002	NS
SW7741	Selenium	0 0077	0 05	NA	NS	< 0 003	NS
SW6010/200 7	Arsenic	0 0049	0 05	< 0 06	NS	< 0 06	< 0 06
SW6010/200 7	Barium	0 587	2	0 34	NS	0 21	0 21
SW6010/200 7	Beryllium	0 0003	0 004	< 0 002	NS	< 0 002	< 0 002
SW6010/200 7	Cadmium	0 0005	0 005	< 0 002	NS	< 0 002	< 0 002
SW6010/200 7	Chromium	0 006	0 1	< 0 005	NS	< 0 005	< 0 005
SW6010/200 7	Lead	0 0016	0 015	< 0 08	NS	< 0 08	< 0 08
SW6010/200 7	Mercury	0 0001	0 002	0 0006	NS	< 0 0002	< 0 0002
SW6010/200 7	Selenium	0 0077	0 05	< 0 08	NS	< 0 08	< 0 08
SW6010/200 7	Silver	0 0002	0 51	< 0 002	NS	< 0 002	< 0 002
SW8151	Herbicides			ND	ND	ND	ND
SW8080	Pesticides			ND	ND	ND	ND
SW601	Trichlorofluoromethane	0 0005	31	ND	ND	0 0034	0 0031
SW601	Trichloroethene	0 0005	0 005	0 0013	ND	ND	ND
SW602	Purgeable Aromatics			ND	ND	ND	ND

WHGLTA101

Method	Analyte	RRS-1	RRS-2	Jan. '99	Mar. '99	Mar. '99 Dup.	June '99	June '99 Dup.
SW6010	Iron	0 224	NV	NA	0 377	0 334		
SW6010	Manganese	0 175	14	NA	1 25	1 28 J	1 12	1 14
SW7421	Lead	0 0016	0 015	0 0083				

WHGLTA103

Method	Analyte	RRS-1	RRS-2	Jan. '99	Jan. '99 Dup.	Mar. '99	June '99
SW6010	Iron	0 224	NV	NA	NA	0 348	0 819
SW6010	Manganese	0 175	14	NA	NA	0 75 J	0 645
SW6010	Silver	0 0002	0 51				0 00078 F
SW7421	Lead	0 0016	0 015	0 003	0 0044		

LF01-1E

Method	Analyte	RRS-1	RRS-2	Oct. '97	April '00
SW6010	Arsenic	0 0049	0 05	NA	
SW6010	Copper	0 0028	1 3	0 0035 F	
SW6010	Iron	0 224	0 3	1 2	NA
SW6010	Manganese	0 175	14	0 1750	NA
SW6010	Silver	0 0002	0 51	NA	
SW7421	Lead	0 0016	0 015	NA	
SW8260	sec-Butylbenzene	0 0005	1 02	NA	
SW8260	tert-Butylbenzene	0 0005	1 02	NA	

WHGLTA104

Method	Analyte	RRS-1	RRS-2	July '99	Sept '99	Nov. '99
SW6010	Copper	0 0028	1 3		0 0028 F	0 0057 B*
SW8270	bis(2-Ethylhexyl)phthalate	0 01	0 01		0 022	

LF01-1C

Method	Analyte	RRS-1	RRS-2	Feb-85	Feb-85 Duplicate	Mar-85	Mar-85 Duplicate
SW7061	Arsenic	0 0049	0 05	NS	NS	0 006	NS
SW7420	Lead	0 0016	0 015	NS	NS	0 003	NS
SW7741	Selenium	0 0077	0 05	NS	NS	< 0 003	NS
SW6010/200 7	Arsenic	0 0049	0 05	< 0 06	NS	< 0 06	NS
SW6010/200 7	Barium	0 587	2	0 18	NS	0 18	NS
SW6010/200 7	Cadmium	0 0005	0 005	< 0 002	NS	< 0 002	NS
SW6010/200 7	Chromium	0 006	0 1	< 0 005	NS	< 0 005	NS
SW6010/200 7	Lead	0 0016	0 015	< 0 08	NS	< 0 08	NS
SW6010/200 7	Mercury	0 0001	0 002	0 0004	NS	0 0004	NS
SW6010/200 7	Selenium	0 0077	0 05	< 0 08	NS	< 0 08	NS
SW6010/200 7	Silver	0 0002	0 51	< 0 002	NS	< 0 002	NS
SW8151	Herbicides			ND	NS	ND	ND
SW8080	Pesticides			ND	NS	ND	ND
SW601	Trichlorofluoromethane	0 0005	31	ND	ND	ND	0 0031
SW601	Trichloroethene	0 0005	0 005	ND	ND	0 0013	0 0014
SW601	Trans-1,2-Dichloroethane	0 0005	0 005	0 0008	0 0008	ND	ND
SW602	Purgeable Aromatics			ND	ND	ND	ND

LF01-1D

Method	Analyte	RRS-1	RRS-2	Oct. '97	April '00
SW6010	Arsenic	0 0049	0 05		
SW6010	Copper	0 0028	1 3		
SW6010	Iron	0 224	0 3	7 030	NA
SW6010	Magnesium	37 8	EN	0 317	NA
SW6010	Silver	0 0002	0 51		
SW7421	Lead	0 0016	0 015		
SW8260	sec-Butylbenzene	0 0005	1 02		
SW8260	tert-Butylbenzene	0 0005	1 02		
SW8260	1,2,4-Trimethylbenzene	0 0005	NV	0 001	NA

LF01-1D

Method	Analyte	RRS-1	RRS-2	Feb-85	Feb-85 Duplicate	Mar-85	Mar-85 Duplicate
SW7061	Arsenic	0 0049	0 05	NS	NS	0 006	NS
SW7420	Lead	0 0016	0 015	NS	NS	< 0 002	NS
SW7741	Selenium	0 0077	0 05	NS	NS	< 0 003	NS
SW6010/200 7	Arsenic	0 0049	0 05	< 0 06	< 0 06	< 0 06	NS
SW6010/200 7	Barium	0 587	2	0 088	0 11	0 12	NS
SW6010/200 7	Cadmium	0 0005	0 005	< 0 002	< 0 002	< 0 002	NS
SW6010/200 7	Chromium	0 006	0 1	< 0 005	< 0 005	< 0 005	NS
SW6010/200 7	Lead	0 0016	0 015	< 0 08	< 0 08	< 0 08	NS
SW6010/200 7	Mercury	0 0001	0 002	< 0 0002	< 0 0002	< 0 0002	NS
SW6010/200 7	Selenium	0 0077	0 05	< 0 08	< 0 08	< 0 08	NS
SW6010/200 7	Silver	0 0002	0 51	< 0 002	< 0 002	< 0 002	NS
SW8151	2,4,5-TP (Silvex)	0 01	0 05	ND	0 0002	ND	NS
SW8080	Pesticides			ND	ND	ND	NS
SW601	Trichlorofluoromethane	0 0005	31	ND	ND	0 0036	0 0038
SW602	Purgeable Aromatics			ND	ND	ND	ND

WHGLTA102

Method	Analyte	RRS-1	RRS-2	Jan. '99	March '99	June '99
SW6010	Arsenic	0 0049	0 05	0 0333 F	0 0419	0 0529
SW6010	Iron	0 224	NV	NA	10 1	11
SW6010	Manganese	0 175	14	NA	1 86	1 75
SW7421	Lead	0 0016	0 015	0 0022		
SW8260	sec-Butylbenzene	0 0005	1 02		0 002	
SW8260	tert-Butylbenzene	0 0005	1 02		0 002	
SW9030	Sulfide	1	NV	1 1 S	NA	NA

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NAS Fort Worth JRB, Texas

Figure 3.8
SWMU 28 / Landfill 1
Analytical Results in Groundwater
January - April 2000
with Radian Groundwater Data, 1985

U.S. Air Force Center for Environmental Excellence

Legend

NAS Fort Worth JRB (Carswell Field)

Landfill Boundary

Rip-rap

-WHGLTA101 Monitoring Well Location

NOTES:
Concentrations reported in mg/L
RRS-1—Risk Reduction Standard 1
RRS-2—Risk Reduction Standard 2
NV—No TNRCC RRS-2 value
NA—Not analyzed.
Elevations reported in feet above mean sea level.
LFO1-1A* Approximate location based on map location (Radian, 1986)

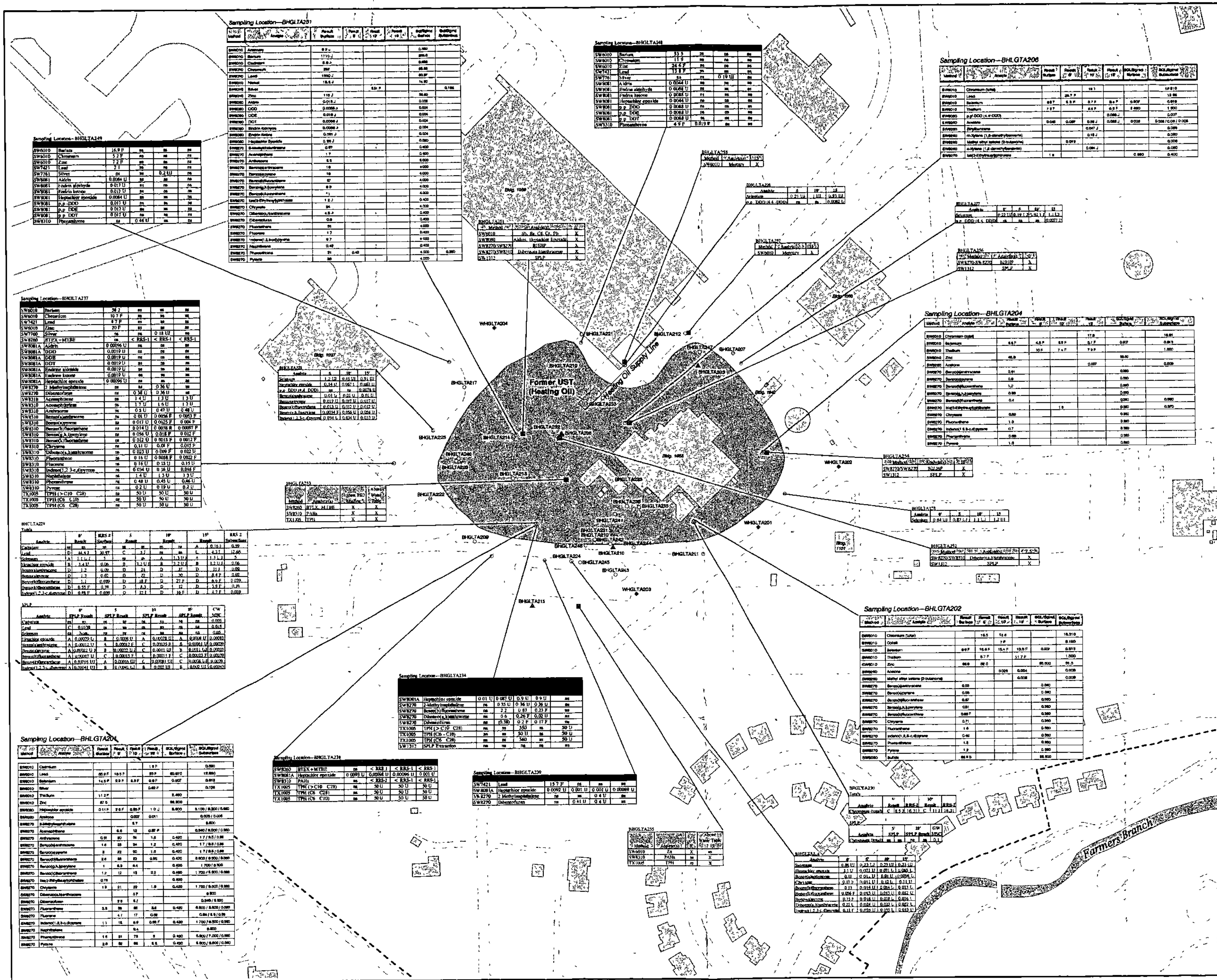
Detection > RRS-2
Radian, 1985 - All results
HydroGeoLogic - Results > RRS-1

N

100 0 100 200
SCALE IN FEET

Filename. X \AFC001\33cab\Report
Phase III Work Plan Addendum\landfill 1 groundwater apr
Project AFC001-33CAB
Created 09/25/00 jbelcher
Revised 01/18/01 cf
Map Source HydroGeoLogic, Inc
ArcView GIS Database 2000

HYDRO GeoLogic INC



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NAS Fort Worth JRB, Texas

Figure 3.9

SWMU 29 / Landfill 2 Analytical Results in Soil and Proposed Sampling

U S Air Force Center
For Environmental Excellence

Legend

- NAS Fort Worth JRB Boundary
- Landfill Boundaries
- Proposed Borehole Location
- Existing Borehole Location (Lithology)
- Existing Borehole Location (Chemical Analysis)
- Existing Borehole/Piezometer Location (Lithology)
- Existing Borehole/Piezometer Location (Chemical Analysis)
- Existing Monitoring Well Location

Notes
Concentrations reported in mg/kg
MSC—Medium-Specific Concentration
SPLP—Synthetic Precipitation Leaching Procedure
A—Non detect or detection below SQL/Bgrnd
B—Non detect. Adjusted Sample Quantitation Limit above MSC
C—Detection below MSC
D—Detection above MSC
ns—not sampled
na—not analyzed
tbd—to be decided
Red—Above MSC
SQL/Bgrnd—Adjusted Sample Quantitation Limit/Background
MQL—Method Quantitation Limit
br—bedrock
x—Proposed Sampling
Phase I Results - Only detections above RRS-1 are reported on the figure
Phase II and III Results - All results are reported. Analytes depicted in (parentheses) exceed RRS-1 but are below MSC

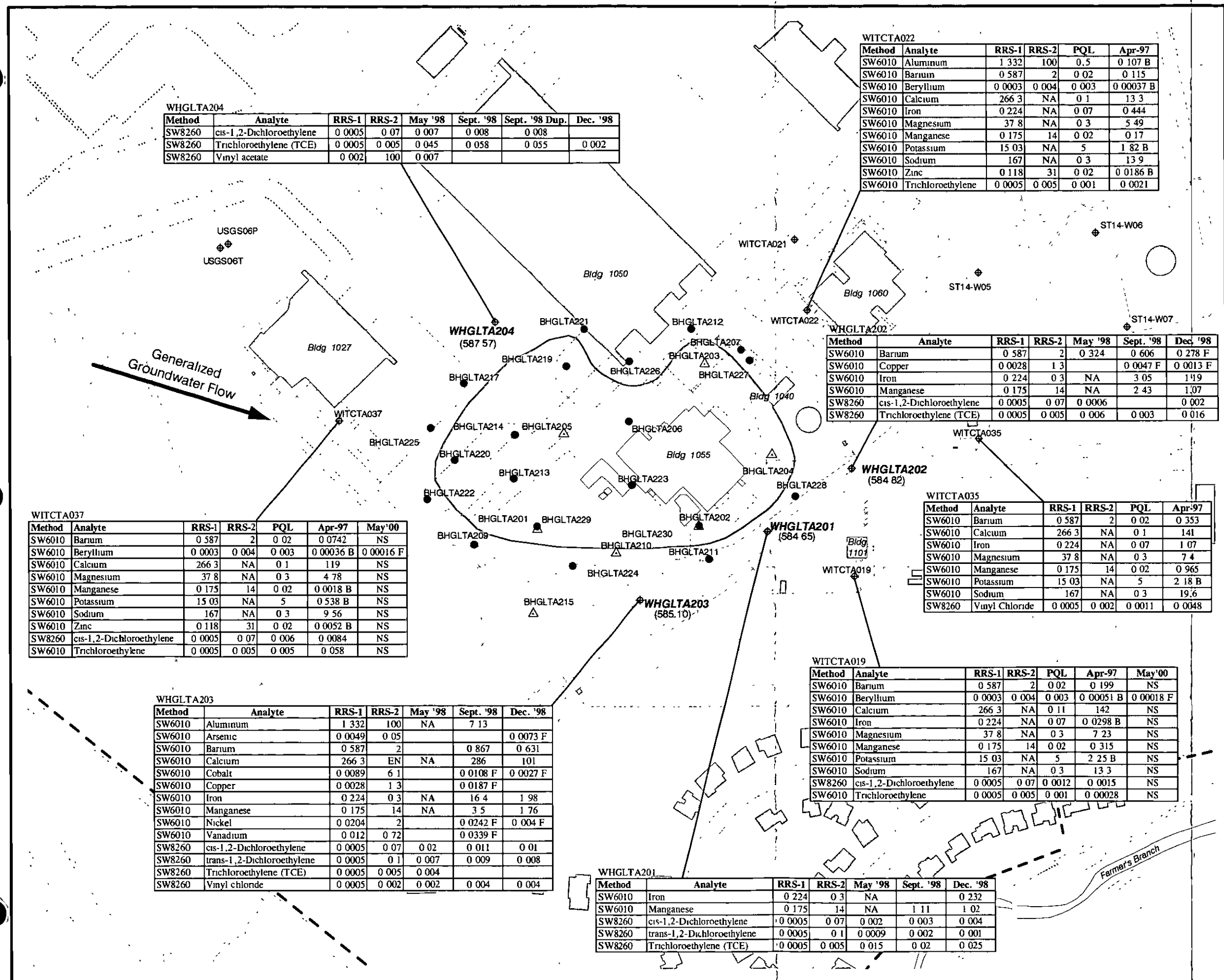
- Round I Results (header)
- Round II Analyses or Results (header)
- Round III Analyses or Results (header)
- Proposed Sampling Location (header)

N

100 0 100 200
SCALE IN FEET

HYDRO GeoLogic INC

Filename X:\Afc001\33cab\Report\Phase III Work Plan Addendum\landfill 2 soil data & proposed samps apr
Project AFC001-33CAB
Created 09/25/00 jbelcher
Revised 01/18/01 cf
Source HydroGeoLogic, Inc—GIS Database



WHGLTA204

Method	Analyte	RRS-1	RRS-2	May '98	Sept. '98	Sept. '98 Dup.	Dec. '98
SW8260	cis-1,2-Dichloroethylene	0 0005	0 07	0 007	0 008	0 008	
SW8260	Trichloroethylene (TCE)	0 0005	0 005	0 045	0 058	0 055	0 002
SW8260	Vinyl acetate	0 002	100	0 007			

WITCTA022

Method	Analyte	RRS-1	RRS-2	PQL	Apr-97
SW6010	Aluminum	1 332	100	0.5	0 107 B
SW6010	Barium	0 587	2	0 02	0 115
SW6010	Beryllium	0 0003	0 004	0 003	0 00037 B
SW6010	Calcium	266 3	NA	0 1	13 3
SW6010	Iron	0 224	NA	0 07	0 444
SW6010	Magnesium	37 8	NA	0 3	5 49
SW6010	Manganese	0 175	14	0 02	0 17
SW6010	Potassium	15 03	NA	5	1 82 B
SW6010	Sodium	167	NA	0 3	13 9
SW6010	Zinc	0 118	31	0 02	0 0186 B
SW6010	Trichloroethylene	0 0005	0 005	0 001	0 0021

WHGLTA202

Method	Analyte	RRS-1	RRS-2	May '98	Sept. '98	Dec. '98
SW6010	Barium	0 587	2	0 324	0 606	0 278 F
SW6010	Copper	0 0028	1 3		0 0047 F	0 0013 F
SW6010	Iron	0 224	0 3	NA	3 05	1 19
SW6010	Manganese	0 175	14	NA	2 43	1.07
SW8260	cis-1,2-Dichloroethylene	0 0005	0 07	0 0006		0 002
SW8260	Trichloroethylene (TCE)	0 0005	0 005	0 006	0 003	0 016

WITCTA037

Method	Analyte	RRS-1	RRS-2	PQL	Apr-97	May'00
SW6010	Barium	0 587	2	0 02	0 0742	NS
SW6010	Beryllium	0 0003	0 004	0 003	0 00036 B	0 00016 F
SW6010	Calcium	266 3	NA	0 1	119	NS
SW6010	Magnesium	37 8	NA	0 3	4 78	NS
SW6010	Manganese	0 175	14	0 02	0 0018 B	NS
SW6010	Potassium	15 03	NA	5	0 538 B	NS
SW6010	Sodium	167	NA	0 3	9 56	NS
SW6010	Zinc	0 118	31	0 02	0 0052 B	NS
SW8260	cis-1,2-Dichloroethylene	0 0005	0 07	0 006	0 0084	NS
SW6010	Trichloroethylene	0 0005	0 005	0 005	0 058	NS

WITCTA035

Method	Analyte	RRS-1	RRS-2	PQL	Apr-97
SW6010	Barium	0 587	2	0 02	0 353
SW6010	Calcium	266 3	NA	0 1	141
SW6010	Iron	0 224	NA	0 07	1 07
SW6010	Magnesium	37 8	NA	0 3	7 4
SW6010	Manganese	0 175	14	0 02	0 965
SW6010	Potassium	15 03	NA	5	2 18 B
SW6010	Sodium	167	NA	0 3	19.6
SW8260	Vinyl Chloride	0 0005	0 002	0 0011	0 0048

WHGLTA203

Method	Analyte	RRS-1	RRS-2	May '98	Sept. '98	Dec. '98
SW6010	Aluminum	1 332	100	NA	7 13	
SW6010	Arsenic	0 0049	0 05			0 0073 F
SW6010	Barium	0 587	2		0 867	0 631
SW6010	Calcium	266 3	EN	NA	286	101
SW6010	Cobalt	0 0089	6 1		0 0108 F	0 0027 F
SW6010	Copper	0 0028	1 3		0 0187 F	
SW6010	Iron	0 224	0 3	NA	16 4	1 98
SW6010	Manganese	0 175	14	NA	3 5	1 76
SW6010	Nickel	0 0204	2		0 0242 F	0 004 F
SW6010	Vanadium	0 012	0 72		0 0339 F	
SW8260	cis-1,2-Dichloroethylene	0 0005	0 07	0 02	0 011	0 01
SW8260	trans-1,2-Dichloroethylene	0 0005	0 1	0 007	0 009	0 008
SW8260	Trichloroethylene (TCE)	0 0005	0 005	0 004		
SW8260	Vinyl chloride	0 0005	0 002	0 002	0 004	0 004

WITCTA019

Method	Analyte	RRS-1	RRS-2	PQL	Apr-97	May'00
SW6010	Barium	0 587	2	0 02	0 199	NS
SW6010	Beryllium	0 0003	0 004	0 003	0 00051 B	0 00018 F
SW6010	Calcium	266 3	NA	0 11	142	NS
SW6010	Iron	0 224	NA	0 07	0 0298 B	NS
SW6010	Magnesium	37 8	NA	0 3	7 23	NS
SW6010	Manganese	0 175	14	0 02	0 315	NS
SW6010	Potassium	15 03	NA	5	2 25 B	NS
SW6010	Sodium	167	NA	0 3	13 3	NS
SW8260	cis-1,2-Dichloroethylene	0 0005	0 07	0 0012	0 0015	NS
SW6010	Trichloroethylene	0 0005	0 005	0 001	0 00028	NS

WHGLTA201

Method	Analyte	RRS-1	RRS-2	May '98	Sept. '98	Dec. '98
SW6010	Iron	0 224	0 3	NA		0 232
SW6010	Manganese	0 175	14	NA	1 11	1 02
SW8260	cis-1,2-Dichloroethylene	0 0005	0 07	0 002	0 003	0 004
SW8260	trans-1,2-Dichloroethylene	0 0005	0 1	0 0009	0 002	0 001
SW8260	Trichloroethylene (TCE)	0 0005	0 005	0 015	0 02	0 025

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NAS Fort Worth JRB, Texas

Figure 3.10
SWMU 29 / Landfill 2

Analytical Results in Groundwater
May - December 1998
with IT Corporation Groundwater Data
1997 and 2000

U.S. Air Force Center For Environmental Excellence

Legend

- NAS Fort Worth JRB (Carswell Field)
- Former Carswell Air Force Base
- Landfill Boundaries
- WHGLTA201 (587 57) — Sampling Location (Groundwater Elevation)
- GMI-22-07M — Existing Monitoring Well Location
- BHGLTA211 — Existing Borehole Location
- BHGLTA202 — Existing Borehole/Piezometer Location

NOTES:
Concentrations reported in mg/L
PQL—Practical Quantification Limit
B—Detection between MDL and PQL unvalidated
F—Detection between MDL and PQL validated
RRS-1—Risk Reduction Standard 1.
RRS-2—Risk Reduction Standard 2.
NA—Not applicable No TNRCC RRS-2 value
Elevations reported in feet above mean sea level as of December 1998

Detection > RRS-2

N

100 0 100 200
Scale in feet

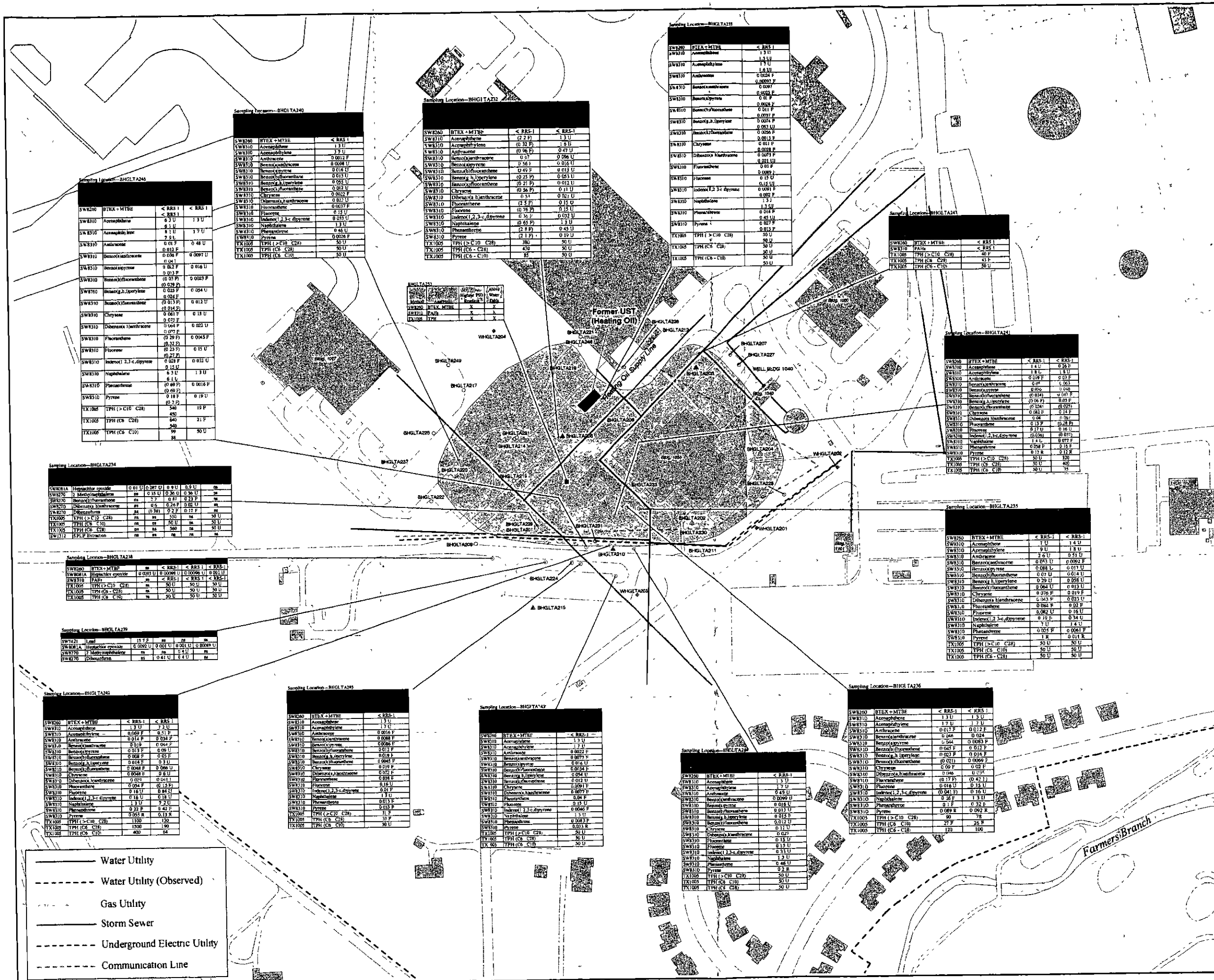
Filename X Afc001\33CAB\Report\ lf2_gw_data apr
Project AFC001-33CAB
Created 04/13/99 jbelcher
Revised 01/18/01 cf
Map Source HydroGeoLogic, Inc GIS Database

HYDRO GeoLogic INC

Figure 3.11

SWMU 29 / Landfill 2 Petroleum Staining Investigation Analytical Results in Soil and Proposed Sampling

U S Air Force Center
For Environmental Excellence



Legend

- NAS Fort Worth JRB Boundary
- Landfill Boundaries
- Existing Borehole Location (Lithology)
- Existing Borehole Location (Chemical Analysis)
- Existing Borehole/Piezometer Location (Lithology)
- Existing Borehole/Piezometer Location (Chemical Analysis)
- Existing Monitoring Well Location
- Proposed Borehole Location

Notes
Concentrations reported in mg/kg
MSC—Medium-Specific Concentration
SPLP—Synthetic Precipitation Leaching Procedure
A—Non detect or detection below SQL/Bgrnd
B—Non detect Adjusted Sample Quantitation Limit above MSC
C—Detection below MSC
D—Detection above MSC
ns—not sampled
na—not analyzed
tbd—to be decided
Red—Above MSC
SQL/Bgrnd—Adjusted Sample Quantitation Limit/Background
MQL—Method Quantitation Limit
br—bedrock
x—Proposed Sampling
Phase I Results - Only detections above RRS-1 are reported on the figure
Phase II and III Results All results are reported Analytes depicted in (parentheses) exceed RRS 1 but are below MSC

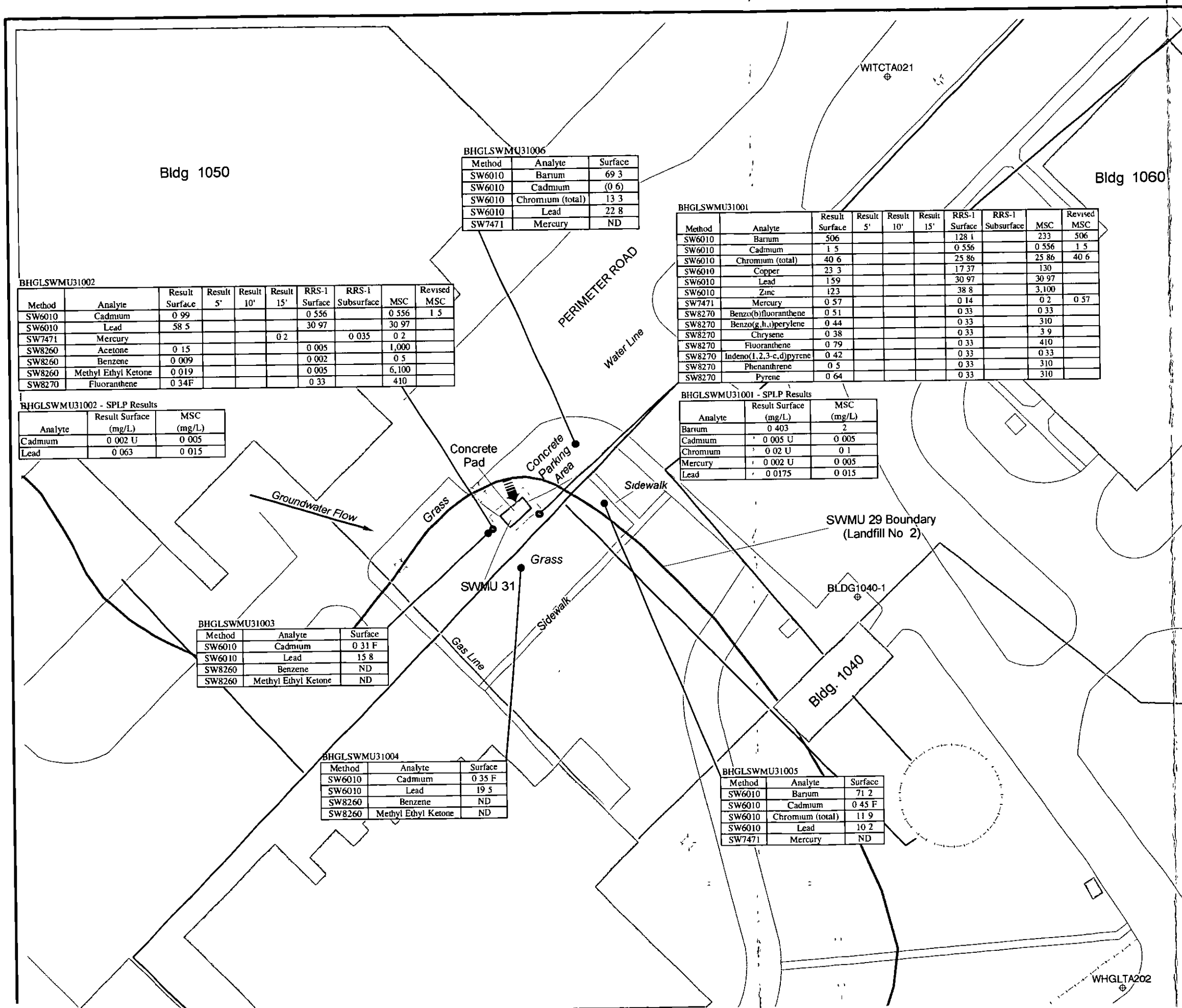
- Round I Results (header)
- Round II Analyses or Results (header)
- Round III Analyses or Results (header)
- Proposed Sampling Locations (header)
- Analyte detected above MSC in soil and in SPLP extract
- Analyte detected above MSC in soil, but detected below MSC in SPLP extract
- Revised MSC Value based on SPLP result

N

100 0 100 200
SCALE IN FEET

HYDRO GeoLogic INC

Filename X:\Afc001\33cab\Report\Phase III Work Plan Addendum\landfill 2 with utilities.apr
Project AFC001-33CAB
Created 09/25/00 jbelcher
Revised 01/18/01 cf
Source HydroGeoLogic, Inc – GIS Database



BHGLSWMU31006

Method	Analyte	Surface
SW6010	Barium	69 3
SW6010	Cadmium	(0 6)
SW6010	Chromium (total)	13 3
SW6010	Lead	22 8
SW7471	Mercury	ND

BHGLSWMU31002

Method	Analyte	Result Surface	Result 5'	Result 10'	Result 15'	RRS-1 Surface	RRS-1 Subsurface	MSC	Revised MSC
SW6010	Cadmium	0 99				0 556		0 556	1 5
SW6010	Lead	58 5				30 97		30 97	
SW7471	Mercury				0 2		0 035	0 2	
SW8260	Acetone	0 15				0 005		1,000	
SW8260	Benzene	0 009				0 002		0 5	
SW8260	Methyl Ethyl Ketone	0 019				0 005		6,100	
SW8270	Fluoranthene	0 34F				0 33		410	

BHGLSWMU31002 - SPLP Results

Analyte	Result Surface (mg/L)	MSC (mg/L)
Cadmium	0 002 U	0 005
Lead	0 063	0 015

BHGLSWMU31001

Method	Analyte	Result Surface	Result 5'	Result 10'	Result 15'	RRS-1 Surface	RRS-1 Subsurface	MSC	Revised MSC
SW6010	Barium	506				128 1		233	506
SW6010	Cadmium	1 5				0 556		0 556	1 5
SW6010	Chromium (total)	40 6				25 86		25 86	40 6
SW6010	Copper	23 3				17 37		130	
SW6010	Lead	159				30 97		30 97	
SW6010	Zinc	123				38 8		3,100	
SW7471	Mercury	0 57				0 14		0 2	0 57
SW8270	Benzo(b)fluoranthene	0 51				0 33		0 33	
SW8270	Benzo(g,h,i)perylene	0 44				0 33		310	
SW8270	Chrysene	0 38				0 33		3 9	
SW8270	Fluoranthene	0 79				0 33		410	
SW8270	Indeno(1,2,3-c,d)pyrene	0 42				0 33		0 33	
SW8270	Phenanthrene	0 5				0 33		310	
SW8270	Pyrene	0 64				0 33		310	

BHGLSWMU31001 - SPLP Results

Analyte	Result Surface (mg/L)	MSC (mg/L)
Barium	0 403	2
Cadmium	0 005 U	0 005
Chromium	0 02 U	0 1
Mercury	0 002 U	0 005
Lead	0 0175	0 015

BHGLSWMU31003

Method	Analyte	Surface
SW6010	Cadmium	0 31 F
SW6010	Lead	15 8
SW8260	Benzene	ND
SW8260	Methyl Ethyl Ketone	ND

BHGLSWMU31004

Method	Analyte	Surface
SW6010	Cadmium	0 35 F
SW6010	Lead	19 5
SW8260	Benzene	ND
SW8260	Methyl Ethyl Ketone	ND

BHGLSWMU31005

Method	Analyte	Surface
SW6010	Barium	71 2
SW6010	Cadmium	0 45 F
SW6010	Chromium (total)	11 9
SW6010	Lead	10 2
SW7471	Mercury	ND

HydroGeoLogic, Inc --- Phase III RFI Work Plans Addendum
NAS Fort Worth JRB, Texas

Figure 3.12

SWMU29 / Landfill 2
Round I and Round II Data
SWMU 31

U.S. Air Force Center for Environmental Excellence

Legend

- Solid Waste Management Unit (SWMU)
- Monitoring Well
- Round I Soil Boring Location
- Round II Soil Boring Location
- Surface Runoff
- Round I Results (header)
- Round II Results (header)
- Analyte detected above MSC SPLP not performed
- Analyte detected above MSC in soil and in SPLP extract
- Analyte detected above MSC in soil, but detected below MSC in SPLP extract

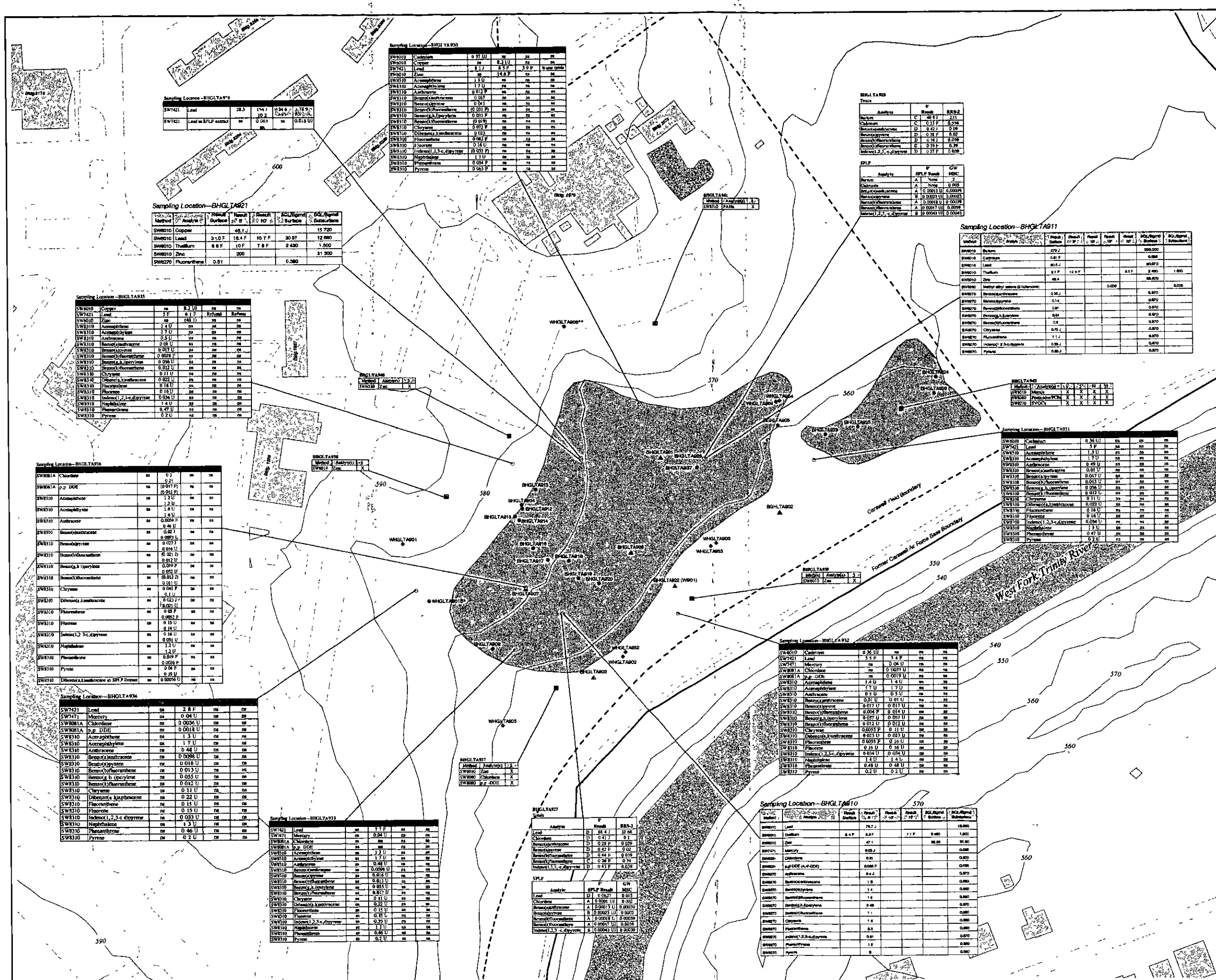
NOTES:
Soil concentrations reported in mg/kg
MSC—Medium-Specific Concentration
Revised MSC—Value based on SPLP result
NV—No Value
F—The analyte was positively identified but the associated numerical value is below the adjusted method quantitation limit.
J—The analyte was positively identified, the quantitation is an estimation
Phase 1 Results - Only detections above RRS-1 are reported on the figure
Phase 2 Results - All results are reported Analytes depicted in (parentheses) exceed RRS-1 but are below MSC.

N

25 0 25 50 75
SCALE IN FEET

Filename X \AFC001\33cab\Report\Phase III Work Plan Addendum \swmu31 apr
Project AFC001-33CAB
Created 10/26/99 jbelcher
Revi sed 01/18/01 cf
Map Source HGL ArcView Database

HYDRO GeoLogic INC



HydroGeoLogic,Inc —Phase III Work Plans Addendum
NAS Fort Worth JRB, Texas

Figure 3.13

SWMU 30 / Landfill 9 Analytical Results in Soil and Proposed Sampling

U S Air Force Center
For Environmental Excellence

Legend

- NAS Fort Worth JRB Boundary
- 600 Ground Elevation Contour (ft msl)
- Landfill Boundaries
- Existing Borehole Location (Lithology)
- Existing Borehole Location (Chemical Analysis)
- Existing Borehole/Piezometer Location (Lithology)
- Proposed Sampling/Borehole Location
- Existing Monitoring Well Location

Notes
Concentrations reported in mg/kg
MSC—Medium-Specific Concentration
SPLP—Synthetic Precipitation Leaching Procedure
A—Non detect or detection below SQL/Bgrnd
B—Non detect Adjusted Sample Quantitation Limit above MSC
C—Detection below MSC
D—Detection above MSC
ns—not sampled
na—not analyzed
tbd—to be decided
Red—Above MSC
SQL/Bgrnd—Adjusted Sample Quantitation Limit/Background
MQL—Method Quantitation Limit
br—bedrock
x—Proposed Sampling
*Well not installed in this boring
**Well not installed due to concrete refusal and dry hole
Phase I Results - Only detections above RRS 1 are reported on the figure
Phase II and III Results - All results are reported Analytes depicted in (parentheses) exceed RRS-1 but are below MSC

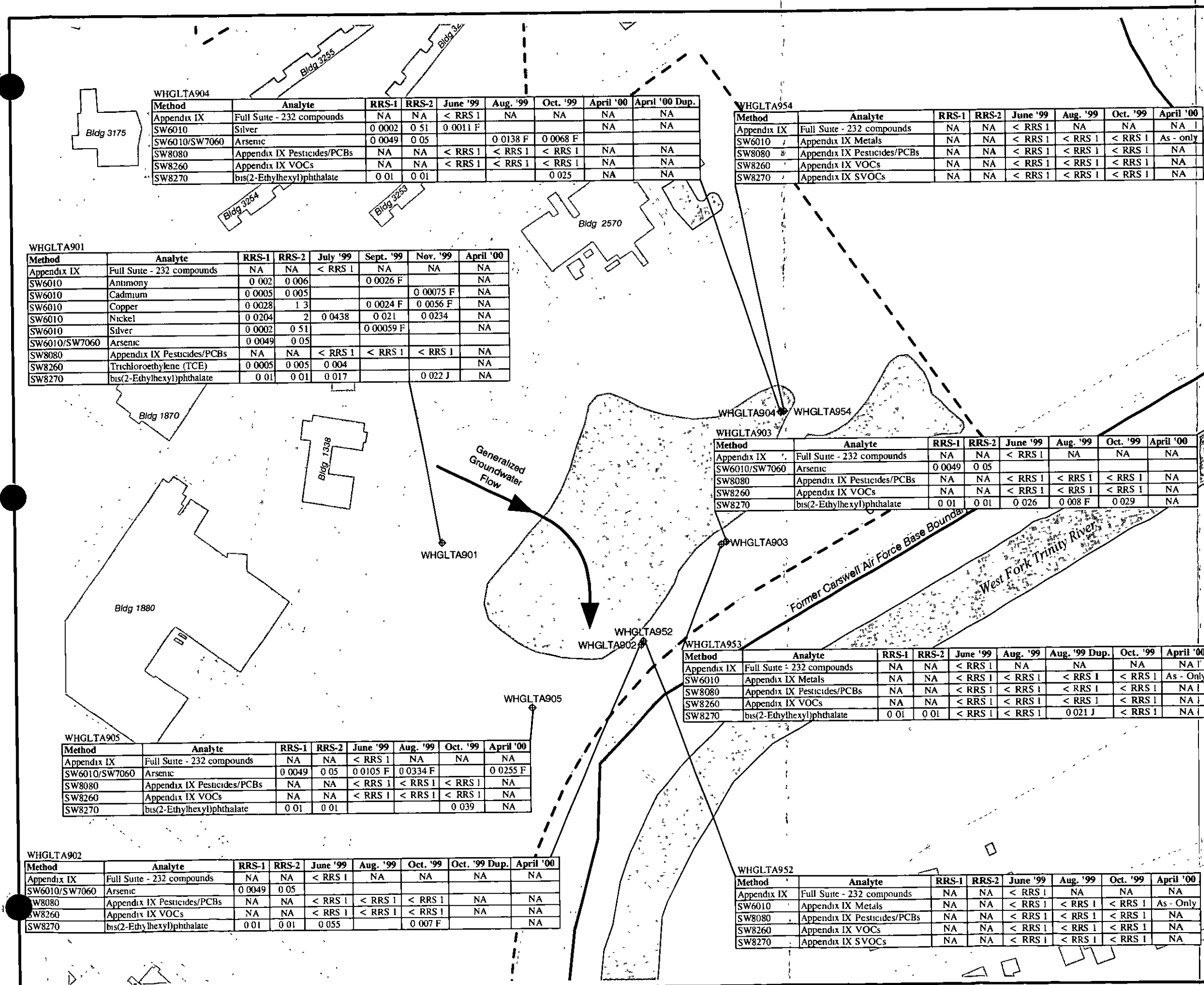
Round I Results (header)
Round II Analyses or Results (header)
Round III Analyses or Results (header)
Proposed Sampling Locations (header)
Analyte detected above MSC in soil but detected MSC in SPLP extract

N

50 0 50 100 150 200
SCALE IN FEET

HYDRO GeoLogic INC.

Filename X:\Afc001\33cab\Report\Phase III Work Plan Addendum\landfill 9 apr
Project AFC001-33CAB
Created 09/25/00 jbelcher
Revised 01/18/01 cf
Source HydroGeoLogic Inc—GIS Database



WHGLTA904

Method	Analyte	RRS-1	RRS-2	June '99	Aug. '99	Oct. '99	April '00	April '00 Dup.
Appendix IX	Full Suite - 232 compounds	NA	NA	< RRS 1	NA	NA	NA	NA
SW6010	Silver	0 0002	0 51	0 0011 F			NA	NA
SW6010/SW7060	Arsenic	0 0049	0 05		0 0138 F	0 0068 F		
SW8080	Appendix IX Pesticides/PCBs	NA	NA	< RRS 1	< RRS 1	< RRS 1	NA	NA
SW8260	Appendix IX VOCs	NA	NA	< RRS 1	< RRS 1	< RRS 1	NA	NA
SW8270	bis(2-Ethylhexyl)phthalate	0 01	0 01			0 025	NA	NA

WHGLTA954

Method	Analyte	RRS-1	RRS-2	June '99	Aug. '99	Oct. '99	April '00
Appendix IX	Full Suite - 232 compounds	NA	NA	< RRS 1	NA	NA	NA
SW6010	Appendix IX Metals	NA	NA	< RRS 1	< RRS 1	< RRS 1	As - only
SW8080	Appendix IX Pesticides/PCBs	NA	NA	< RRS 1	< RRS 1	< RRS 1	NA
SW8260	Appendix IX VOCs	NA	NA	< RRS 1	< RRS 1	< RRS 1	NA
SW8270	Appendix IX SVOCs	NA	NA	< RRS 1	< RRS 1	< RRS 1	NA

WHGLTA901

Method	Analyte	RRS-1	RRS-2	July '99	Sept. '99	Nov. '99	April '00
Appendix IX	Full Suite - 232 compounds	NA	NA	< RRS 1	NA	NA	NA
SW6010	Antimony	0 002	0 006		0 0026 F		NA
SW6010	Cadmium	0 0005	0 005			0 00075 F	NA
SW6010	Copper	0 0028	1 3		0 0024 F	0 0056 F	NA
SW6010	Nickel	0 0204	2	0 0438	0 021	0 0234	NA
SW6010	Silver	0 0002	0 51		0 00059 F		NA
SW6010/SW7060	Arsenic	0 0049	0 05				
SW8080	Appendix IX Pesticides/PCBs	NA	NA	< RRS 1	< RRS 1	< RRS 1	NA
SW8260	Trichloroethylene (TCE)	0 0005	0 005	0 004			NA
SW8270	bis(2-Ethylhexyl)phthalate	0 01	0 01	0 017		0 022 J	NA

WHGLTA903

Method	Analyte	RRS-1	RRS-2	June '99	Aug. '99	Oct. '99	April '00
Appendix IX	Full Suite - 232 compounds	NA	NA	< RRS 1	NA	NA	NA
SW6010/SW7060	Arsenic	0 0049	0 05				
SW8080	Appendix IX Pesticides/PCBs	NA	NA	< RRS 1	< RRS 1	< RRS 1	NA
SW8260	Appendix IX VOCs	NA	NA	< RRS 1	< RRS 1	< RRS 1	NA
SW8270	bis(2-Ethylhexyl)phthalate	0 01	0 01	0 026	0 008 F	0 029	NA

WHGLTA953

Method	Analyte	RRS-1	RRS-2	June '99	Aug. '99	Aug. '99 Dup.	Oct. '99	April '00
Appendix IX	Full Suite - 232 compounds	NA	NA	< RRS 1	NA	NA	NA	NA
SW6010	Appendix IX Metals	NA	NA	< RRS 1	< RRS 1	< RRS 1	< RRS 1	As - Only
SW8080	Appendix IX Pesticides/PCBs	NA	NA	< RRS 1	< RRS 1	< RRS 1	< RRS 1	NA
SW8260	Appendix IX VOCs	NA	NA	< RRS 1	< RRS 1	< RRS 1	< RRS 1	NA
SW8270	bis(2-Ethylhexyl)phthalate	0 01	0 01	< RRS 1	< RRS 1	0 021 J	< RRS 1	NA

WHGLTA905

Method	Analyte	RRS-1	RRS-2	June '99	Aug. '99	Oct. '99	April '00
Appendix IX	Full Suite - 232 compounds	NA	NA	< RRS 1	NA	NA	NA
SW6010/SW7060	Arsenic	0 0049	0 05	0 0105 F	0 0334 F		0 0255 F
SW8080	Appendix IX Pesticides/PCBs	NA	NA	< RRS 1	< RRS 1	< RRS 1	NA
SW8260	Appendix IX VOCs	NA	NA	< RRS 1	< RRS 1	< RRS 1	NA
SW8270	bis(2-Ethylhexyl)phthalate	0 01	0 01			0 039	NA

WHGLTA902

Method	Analyte	RRS-1	RRS-2	June '99	Aug. '99	Oct. '99	Oct. '99 Dup.	April '00
Appendix IX	Full Suite - 232 compounds	NA	NA	< RRS 1	NA	NA	NA	NA
SW6010/SW7060	Arsenic	0 0049	0 05					
SW8080	Appendix IX Pesticides/PCBs	NA	NA	< RRS 1	< RRS 1	< RRS 1	NA	NA
SW8260	Appendix IX VOCs	NA	NA	< RRS 1	< RRS 1	< RRS 1	NA	NA
SW8270	bis(2-Ethylhexyl)phthalate	0 01	0 01	0 055		0 007 F		NA

WHGLTA952

Method	Analyte	RRS-1	RRS-2	June '99	Aug. '99	Oct. '99	April '00
Appendix IX	Full Suite - 232 compounds	NA	NA	< RRS 1	NA	NA	NA
SW6010	Appendix IX Metals	NA	NA	< RRS 1	< RRS 1	< RRS 1	As - Only
SW8080	Appendix IX Pesticides/PCBs	NA	NA	< RRS 1	< RRS 1	< RRS 1	NA
SW8260	Appendix IX VOCs	NA	NA	< RRS 1	< RRS 1	< RRS 1	NA
SW8270	Appendix IX SVOCs	NA	NA	< RRS 1	< RRS 1	< RRS 1	NA

HydroGeoLogic, Inc —Phase III Work Plans Addendum
NAS Fort Worth JRB, Texas

Figure 3.14
SWMU 30 / Landfill 9

Analytical Results Rounds in Groundwater
July 1998 - April 2000

U.S. Air Force Center for Environmental Excellence

Legend

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

——— Former Carswell Air Force Base

Landfill Boundaries

WHGLTA905 ⊕ Existing Monitoring Well Location

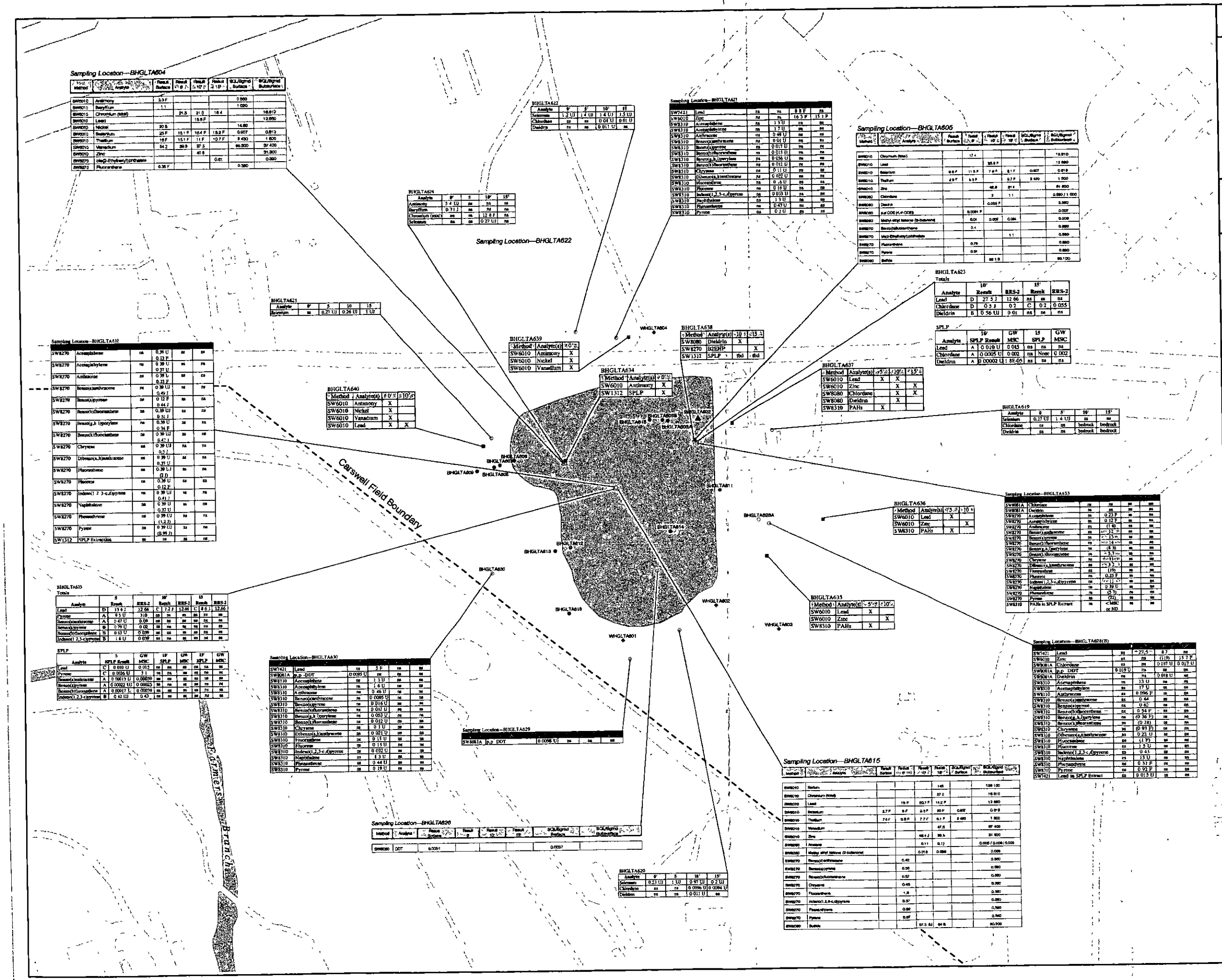
NOTES:
Concentrations reported in mg/L
RRS-1—Risk Reduction Standard 1
RRS-2—Risk Reduction Standard 2.
NA—Not applicable. No TNRCC RRS-2 value
B—Detected in associated method blank
Detection > RRS-2

N

100 0 100 200
SCALE IN FEET

Filename X \AFC001\33cab\Report\landfill9 groundwater apr
Project AFC001-33CAB
Created 09/26/00 jbelcher
Revised 01/18/01 cf
Map Source HydroGeoLogic, Inc
ArcView GIS Database 2000

HYDRO GeoLogic INC



HydroGeologic, Inc — Phase III RFI Work Plans Addendum
NAS Fort Worth JRB, Texas

Figure 3.15

SWMU 62 / Landfill 6 Analytical Results in Soil and Proposed Sampling

U.S. Air Force Center
For Environmental Excellence

Legend

- NAS Fort Worth JRB Boundary
- Landfill Boundaries
- Existing Borehole Location (Lithology)
- Existing Borehole Location (Chemical Analysis)
- Existing Borehole/Piezometer Location (Lithology)
- Existing Borehole/Piezometer Location (Chemical Analysis)
- Proposed Borehole Location
- Existing Monitoring Well Location

Notes.
Concentrations reported in mg/kg
MSC—Medium-Specific Concentration
SPLP—Synthetic Precipitation Leaching Procedure
A—Non detect or detection below SQL/Bgrnd
B—Non detect Adjusted Sample Quantitation Limit above MSC
C—Detection below MSC
D—Detection above MSC
ns—not sampled
na—not analyzed
tbd—to be decided
Red—Above MSC
SQL/Bgrnd—Adjusted Sample Quantitation Limit/Background
MQL—Method Quantitation Limit
br—bedrock
x—Proposed Sampling
Phase I Results - Only detections above RRS-1 are reported on the figure
Phase II and III Results - All results are reported Analytes depicted in (parentheses) exceed RRS 1, but are below MSC

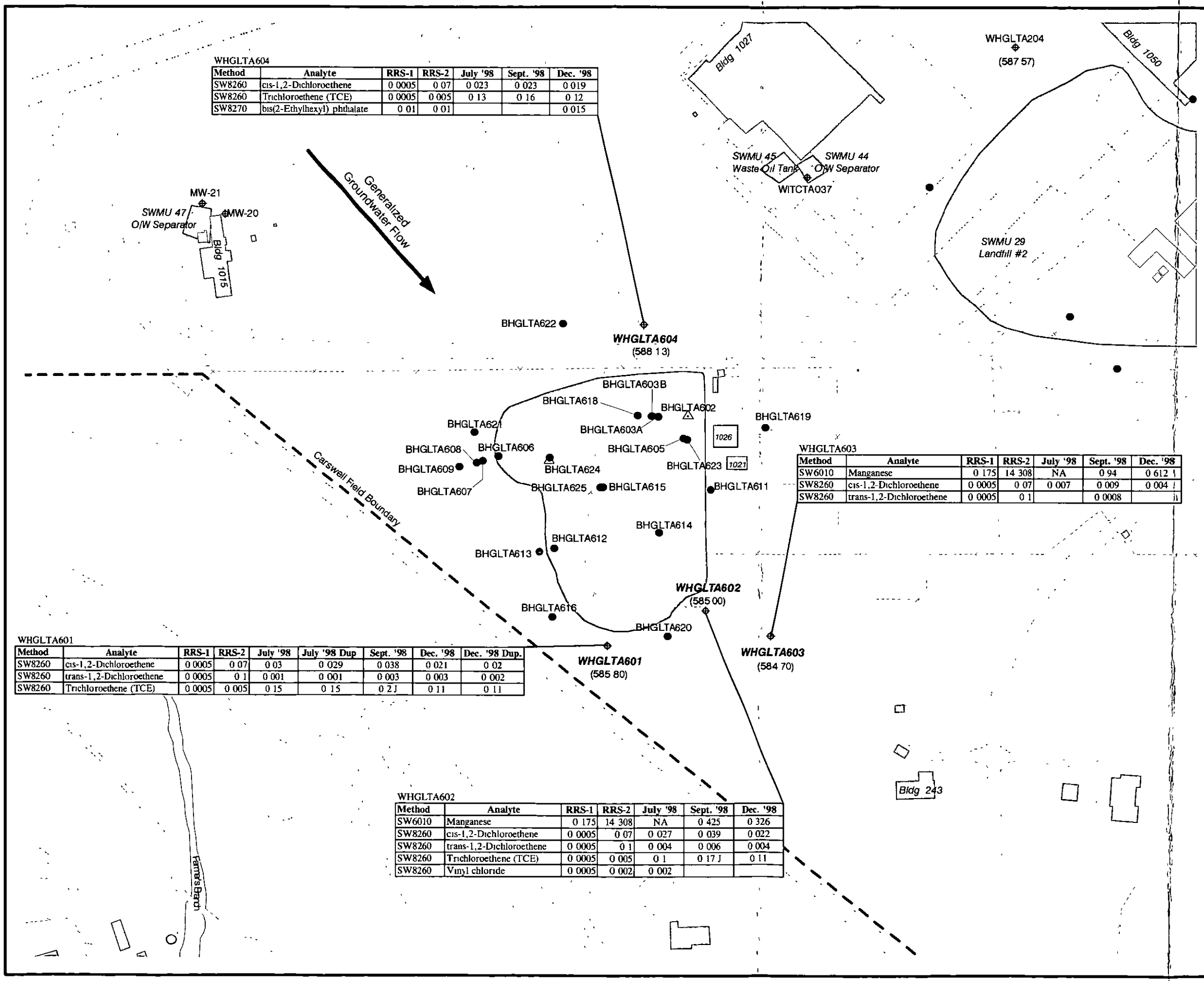
- Round I Results (header)
- Round II Analyses or Results (header)
- Round III Analyses or Results (header)
- Proposed Sampling Locations (header)
- Analyte detected above MSC in soil, but detected below MSC in SPLP extract

N

90 0 90 180
SCALE IN FEET

HYDRO GeoLogic INC.

Filename X:\Afc001\33cab\Report\Phase III Work Plan Addendum\landfill 6.apr
Project AFC001-33CAB
Created 09/25/00 jbelcher
Revised 01/18/01 cf
Source HydroGeoLogic, Inc—GIS Database



WHGLTA604

Method	Analyte	RRS-1	RRS-2	July '98	Sept. '98	Dec. '98
SW8260	cis-1,2-Dichloroethene	0 0005	0 07	0 023	0 023	0 019
SW8260	Trichloroethene (TCE)	0 0005	0 005	0 13	0 16	0 12
SW8270	bis(2-Ethylhexyl) phthalate	0 01	0 01			0 015

WHGLTA603

Method	Analyte	RRS-1	RRS-2	July '98	Sept. '98	Dec. '98
SW6010	Manganese	0 175	14 308	NA	0 94	0 612
SW8260	cis-1,2-Dichloroethene	0 0005	0 07	0 007	0 009	0 004
SW8260	trans-1,2-Dichloroethene	0 0005	0 1		0 0008	

WHGLTA601

Method	Analyte	RRS-1	RRS-2	July '98	July '98 Dup	Sept. '98	Dec. '98	Dec. '98 Dup.
SW8260	cis-1,2-Dichloroethene	0 0005	0 07	0 03	0 029	0 038	0 021	0 02
SW8260	trans-1,2-Dichloroethene	0 0005	0 1	0 001	0 001	0 003	0 003	0 002
SW8260	Trichloroethene (TCE)	0 0005	0 005	0 15	0 15	0 2 J	0 11	0 11

WHGLTA602

Method	Analyte	RRS-1	RRS-2	July '98	Sept. '98	Dec. '98
SW6010	Manganese	0 175	14 308	NA	0 425	0 326
SW8260	cis-1,2-Dichloroethene	0 0005	0 07	0 027	0 039	0 022
SW8260	trans-1,2-Dichloroethene	0 0005	0 1	0 004	0 006	0 004
SW8260	Trichloroethene (TCE)	0 0005	0 005	0 1	0 17 J	0 11
SW8260	Vinyl chloride	0 0005	0 002	0 002		

HydroGeoLogic, Inc —Phase III Work Plans Addendum
NAS Fort Worth JRB, Texas

Figure 3.16

SWMU 62/Landfill 6

Analytical Results in Groundwater
May 1998 - December 1998

U.S. Air Force Center for Environmental Excellence

Legend

- NAS Fort Worth JRB (Carswell Field)
- Landfill Boundaries
- WHGLTA201 (587 57) — Sampling Location (Groundwater Elevation)
- GMI-22-07M — Existing Monitoring Well Location
- BHGLTA211 — Existing Borehole Location
- BHGLTA202 — Existing Borehole/Piezometer Location

NOTES:
Concentrations reported in mg/L
RRS-1—Risk Reduction Standard 1.
RRS-2—Risk Reduction Standard 2
NA—Not Analyzed
Elevations reported in feet above mean sea level as of December 1998

Detection > RRS-2

N

75 0 75 150
Scale in feet

Filename X:\AFCEE\33CAB\REPORT\Phase3_RI-I\ lf6_gw_data.apr
Project AFC001-33CAB
Created 01/13/99 jbelcher
Revised 01/18/01 cf
Map Source HydroGeoLogic Inc GIS Database

HYDRO GeoLogic INC

TABLES

Table 3.1
SWMU 17 / Landfill 7
Standard 3 Soil Issues

Row	Location	Method	Analyte	RRS-1	RRS-2	GWP MSC	Result	Confirm Result	Confirm II Result	SPLP Result	GW MSC	SS MSC	Note	Delineation	Action	Confirm Boring	Proposed Delineation and/or Charaterization Boring(s)
1	B704-10'/B727-10'	SW6010	Arsenic	6 58	6 58	5	6 7 F	5 4		na	0 05		NC - Detected in GW, Determine if an LF7 source for As exists, Run SPLP if detected at Std 3		New Characterization Borings 0',5',10',15'		B761, B762, B763
2	B701-5'/B718-5'	SW6010	Cadmium	0 59	0 59	0.5	1 5 F	0 67		0 0006 U	0 005	0 67	SS MSC > all detetions, need delineation to W	B703N, B504E, B704S	Delineate to W		Obtain Data from B721-5'
3	B701-5'/B718-5'	SW6010	Chromium	16 31	16 31	10	26 4	13 4 J		na	0 1		Not confirmed, Matrix interference with SW6010-std	< Background	None		
4	B702-5'	SW6010	Chromium	16 31	16 31	10	27 3	None			0 1		Run w/ICP-Std; Elevated Conc. Due to Matrix Interference	< Background, Confirm along with Pb	Confirmation/SPLP	B764-5'	
5	B701-0'/B718-0'	SW6010	Lead	30 97	30 97	1 5	40 2 F	169 J		0.0426	0 015	73 1	Failed SPLP, Delineated, Excavate	B702N, B504E, B704S, B721W	IRA - Excavation		
6	B701-5'/B718-5'	SW6010	Lead	12 66	12 66	1 5	90.1	42 6		None	0 015	73 1	Std 2, Delineated, confirmed < SS MSC	B703N, B504E, B720CS, B721W	None		
7	B702-5'	SW6010	Lead	12 66	12 66	1 5	92.6	None		None	0 015	73.1	Std 3, Need delineation N and E	B504S, B703W	Confirm/SPLP, Delineate, IRA	B764-5'	B767N-5', B765N-5', B766E-5'
8	B702-10'	SW6010	Lead	12.66	12 66	1 5	24 9 F	None		None	0 015	73.1	Std 2, Need delineation W, delineated by B725E at WaterTable	B724N, B725E, B508S,	Delineate to W		B762W-10'
9	B704-5'	SW6010	Lead	12 66	12 66	1.5	13 3 F	None		None	0 015	73 1	Natural Variation of Background, Delineated	B703N, B508E, B720CS, B721W	None		
10	B723B-0'	SW7421	Lead	30 97	30 97	1 5	73 1	None		0 0027 F	0 015	73 1	< SS MSC, Need Delineated to E	B831N, B704S, B722W	Delineate to E		B767E-0'
11	B724-5'	SW7421	Lead	12 66	12 66	1 5	16	None		None	0 015	73 1	Natural Variation of Background, Need delineation to N and E	B504S, B703W	Delineate N and E		B767N-5', B766E-5'
12	B725-0'	SW7421	Lead	30 97	30 97	1 5	467 F	None		None	0 015	73 1	Confirm/SPLP, Delineate N and E	B504S, B702W	Delineate, IRA-Excavation	B768-0'	B767N-0', B766E-0'
13	B725-5'	SW7421	Lead	12 66	12 66	1 5	15 8	None		None	0 015	73 1	Natural Variation of Background, Need delineation to N and E	B504S, B703W	Delineate N and E		B767N-5', B766E-5'
14	Various	SW6010	Thallium	-	-	0 003	< 20	None		None	0 002		Statistically the same as background	None	None		
15	B704-5'/B727-5'	SW8081A	Chlordane	0 009	0 2	0 2	1 5	0 041		None	0 002		Std 2, Delineated	B701N, B508E, B716S, B717W	None		
16	B719-5'	SW8081	Chlordane	0 009	0 2	0 2	0 13	None		None	0 002		Std 2, Delineated	B701N, B508E, B716S, B717W	None		
17	B704-0'/B727-0'	SW8081	PCB1254	0 091	0 05	0 05	6 4 F	0 091 U	0 091 U	None	0 0005		Not confirmed; Delineated	B701N, B727E, B716S, B716W	None		
18	B703-5'	SW8260	2-Hexanone	0 005	NV	NV	0 021 J				NV		Delineated	B723BN, B702E, B701S, B722W	None		
19	B735-10'	SW8260B	Acrylonitrile	0 054	180^	NV	1 1						Not confirmed, Need Delineation to E	B724N, B745S, B703W	Delineate to E		B766E-10'
20	B701-0'/B718-0'	SW8270/SW8310	Benzo(a)anthracene	0 33	0 33	0 039	0 66	0 46		0 00013 U	0 00039	0 46	Confirmed at SS MSC, Need Delineation to S	B831N, B504E, B722W	Confirmation/SPLP, Delineate S	B770-0'	B771S-0'
21	B728-0'	SW8270	Benzo(a)anthracene	0 33	0 33	0 039	14 4			None	0 00039	0 46	Std 3, Need confirmation/SPLP and Delineation to S	B831N, B504E, B721W	Confirmation/SPLP, Delineate S	B770-0'	B771S-0'
22	B703-0'/B729-0'	SW8270	Benzo(a)anthracene	0 33	0 33	0 039	1 3	0 2 F		None	0 00039	0 46	Confirmed < SS MSC, Need Delineation to N	B702E, B704S, B722W	Delineate N		B767N-0'
23	B702-15'	SW8270	Benzo(a)anthracene	0 33	0 33	0 039	0 45			None	0 00039	0 46	< SS MSC, Delineated	B724N-10', B725E-5', B704S, B703W			
24	B726-10'	SW8270	Benzo(a)anthracene	0 33	0 33	0 039	0 29 F			None	0 00039	0 46	< SS MSC; Need Delineation to W	B724N-10', B725E-5', B704S	Delineate W		B763W-10'
25	B720C-0'	SW8310	Benzo(a)anthracene	0 009	0 039	0 039	0 045			None	0 00039	0 46	< SS MSC, Need Delineation to S	B831N, B508E, B721W	Need Delineation to S		B771S-0'
26	B723B-0'	SW8310	Benzo(a)anthracene	0 009	0 039	0 039	41 F			None	0 00039	0 46	Std 3, Need confirmation/SPLP and Delineation to E	B831N, B704S, B722W	Confirmation/SPLP, Delineate E	B765-0'	B767E-0'
27	B724-5'	SW8310	Benzo(a)anthracene	0 009	0 039	0 039	0 061 J			None	0 00039	0 46	< SS MSC, Need Delineation N and E	B725S, B703W	Need Delineation N and E		B767N-5', B766E-5'
28	B725-0'	SW8310	Benzo(a)anthracene	0 009	0 039	0 039	0 047 F			None	0 00039	0 46	< SS MSC, Need Delineation N and E	B704S, B722W	Need Delineation N and E		B767N-0', B766E-0'
29																	
30	B701-0'/B718-0'	SW8270/SW8310	Benzo(a)pyrene	0 33	0 33	0 02	0 88	0 59		0 00023 U	0 00023	0 59	Confirmed at SS MSC; Need Delineation to S	B831N, B504E, B721W	Confirmation/SPLP, Delineate S	B770-0'	B765S-0'
31	B728-0'	SW8270	Benzo(a)pyrene	0 33	0 33	0 02	4 1			None	0 00023	0 59	Std 3, Need confirmation/SPLP	B831N, B504E, B704S, BB721W	Confirmation/SPLP	B770-0'	
32	B703-0'/B729-0'	SW8270	Benzo(a)pyrene	0 33	0 33	0 02	1 5	0 28 F		None	0 00023	0 59	Confirmed < SS MSC, Need Delineation to N	B702E, B704S, B722W	Delineate N		B767N-0'
33	B702-15'	SW8270	Benzo(a)pyrene	0 33	0 33	0 02	0 52			None	0 00023	0 59	< SS MSC, Need Delineation N	B725E, B505S, B703W	Delineate N		B767N-10' WT at 15'
34	B726-10'	SW8270	Benzo(a)pyrene	0 33	0 33	0 02	0 4 F			None	0 00023	0 59	< SS MSC, Need Delineation W	B724N, B725E-5', B704S	Delineate W		B763W-10'
35	B720C-0'	SW8310	Benzo(a)pyrene	0 015	0 02	0 02	0 06			None	0 00023	0 59	Std 3, Need Delineation to S	B704N, B508E, B721W	Need Delineation to S		B771S-0'
36	B723B-0'	SW8310	Benzo(a)pyrene	0 015	0 02	0 02	1 3 F			None	0 00023	0 59	Std 3, Need confirmation/SPLP and Delineation E and S	B831N, B722W	Confirmation/SPLP, Delineate E and S	B765-0'	B767E-0', B771S-0'
37	B724-5'	SW8310	Benzo(a)pyrene	0 015	0 02	0 02	0 081 J			None	0 00023	0 59	< SS MSC; Need Delineation N and E	B725S, B703W	Need Delineation N and E		B767N-5', B766E-5'
38	B725-0'	SW8310	Benzo(a)pyrene	0 015	0 02	0 02	0 076 F			None	0 00023	0 59	< SS MSC, Need Delineation N and E	B504S, B722W	Need Delineation N and E		B767N-0', B766E-0'
39																	
40	B701-0'/B718-0'	SW8270	Benzo(b)fluoranthene	0 33	0 33	0 039	1 2	0 54 F		0 00018 U	0 00039	0 54	Confirmed at SS MSC, Need Delineation to S	B831N, B504E, BB721W	Confirmation/SPLP, Delineate S	B770-0'	B771S-0'
41	B728-0'	SW8270	Benzo(b)fluoranthene	0 33	0 33	0 039	4 8			None	0 00039	0 54	Std 3, Need confirmation/SPLP and Delineation to S	B831N, B504E, B722W	Confirmation/SPLP, Delineate S	B770-0'	B771S-0'
42	B703-0'/B729-0'	SW8270	Benzo(b)fluoranthene	0 33	0 33	0 039	1 2	0 36 F		None	0 00039	0 54	Confirmed < SS MSC, Delineate with other PAHs	B702E, B504S, B722W	Delineate N		B767N-0'
43	B702-5'	SW8270	Benzo(b)fluoranthene	0 33	0 33	0 039	0 37			None	0 00039	0 54	< SS MSC, Delineate N	B725E, B718S, B703W	Delineate N		B767N-5'
44	B702-15'	SW8270	Benzo(b)fluoranthene	0 33	0 33	0 039	0 71			None	0 00039	0 54	Std 3, Delineated	B724N-10', B725E-5', B704S-10', B703W			
45	B726-10'	SW8270	Benzo(b)fluoranthene	0 33	0 33	0 039	1 7 U			None	0 00039	0 54	Elevated reporting limit; Delineate W with other PAHs	B724N-10', B725E-5', B704S	Delineate W		B763W-10'
46	B720C-0'	SW8310	Benzo(b)fluoranthene	0 012	0 039	0 039	0 052 F			None	0 00039	0 54	< SS MSC, Need Delineation to S	B831N, B508E, B722W	Need Delineation to S		B771S-0'
47	B723B-0'	SW8310	Benzo(b)fluoranthene	0 012	0 039	0 039	1 3 F			None	0 00039	0 54	Std 3, Need confirmation/SPLP and Delineation E and S	B831N, B722W	Confirmation/SPLP, Delineate E and S	B765-0'	B767E-0', B771S-0'
48	B724-5'	SW8310	Benzo(b)fluoranthene	0 012	0 039	0 039	0 092			None	0 00039	0 54	< SS MSC, Need Delineation to N and E	B725S, B703W	Need Delineation N and E		B767N-5', B766E-5'
49	B725-0'	SW8310	Benzo(b)fluoranthene	0 012	0 039	0 039	0 098			None	0 00039	0 54	< SS MSC, Need Delineation to N and E	B504S, B722W	Need Delineation N and E		B767N-0', B766E-0'

Table 3.1
SWMU 17 / Landfill 7
Standard 3 Soil Issues

Row	Location	Method	Analyte	RRS-1	RRS-2	GWP MSC	Result	Confirm Result	Confirm II Result	SPLP Result	GW MSC	SS MSC	Note	Delineation	Action	Confirm Boring	Proposed Delineation and/or Charaterization Boring(s)
50																	
51	B701-0'/B718-0'	SW8270/SW8310	Benzo(k)fluoranthene	0 33	0 33	0 39	0.56	0 25		0 00017 U	0 0039	0 25	Confirmed at SS MSC, Need Delineation to S	B831N, B504E, B721W	Confirmation/SPLP, Delineate S	B770-0'	B771S-0'
52	B728-0'	SW8270	Benzo(k)fluoranthene	0 33	0 33	0 39	3			None	0 0039	0 25	Std 3; Need confirmation/SPLP and Delineation to S	B831N, B504E, B721W	Confirmation/SPLP, Delineate S	B770-0'	B771S-0'
53	B703-0'/B729-0'	SW8270	Benzo(k)fluoranthene	0 33	0 33	0 39	1 6	0 29 F		None	0 0039	0 25	Std 3, Need Delineation to N and E	B504S, B722W	Delineate N and E		B767N-0', B766E-0'
54	B726-10'	SW8270	Benzo(k)fluoranthene	0 33	0 33	0 39	1 7 U			None	0 0039	0 25	Elevated reporting limit, Delineate W with other PAHs	B724N-10', B725E-5', B704S	Delineate W		B762W-10'
55	B720C-0'	SW8310	Benzo(k)fluoranthene	0 011	0 39	0 39	0 045 F			None	0 0039	0 25	< SS MSC; Need Delineation to S	B831N, B704E, B721W	Need Delineation to S		B771S-0'
56	B723B-0'	SW8310	Benzo(k)fluoranthene	0 011	0 39	0 39	0 63 F			None	0 0039	0 25	Std 3, Need confirmation/SPLP and Delineation to E and S	B831N, B722W	Confirmation/SPLP, Delineate E and S	B765-0'	B767E-0', B771S-0'
57	B724-5'	SW8310	Benzo(k)fluoranthene	0 011	0 39	0 39	0 037 F			None	0 0039	0 25	< SS MSC; Need Delineation to N and E	B725S, B703W	Need Delineation N and E		B767N-5', B766E-5'
58	B725-0'	SW8310	Benzo(k)fluoranthene	0 011	0 39	0 39	0 057 F			None	0 0039	0 25	< SS MSC, Need Delineation to N and E	B504S, B722W	Need Delineation N and E		B767N-0', B766E-0'
59																	
60	B728-0'	SW8270	Chrysene	0 33	3 92	3 9	4 8			None	0 039		Std 3, Need confirmation/SPLP and Delineation to S	B831N, B504E, B721W	Confirmation/SPLP, Delineate S	B770-0'	B771S-0'
61																	
62	B701-0'/B718-0'	SW8270/SW8310	Dibenzo(a,h)anthracene	0 33	0 33	0 02	< 0 33	na		None	0 0002		Not Detected, Delineate with other PAHs	B831N, B504E, BB721W	Confirmation/SPLP, Delineate S	B770-0'	B771S-0'
63	B728-0'	SW8270	Dibenzo(a,h)anthracene	0 33	0 33	0 02	1.1 F			None	0 0002		Std 3, Need confirmation/SPLP and Delineation to S	B831N, B504E, BB721W	Confirmation/SPLP, Delineate S	B770-0'	B771S-0'
64	B703-0'/B729-0'	SW8270/SW8310	Dibenzo(a,h)anthracene	0 33	0 33	0 02	< 0 33	0 38 U		None	0 0002		Not Detected, Delineate with other PAHs	B504S, B722W	Delineate N and E		B767N-0' B766E-0'
65	B702-15'	SW8270/SW8310	Dibenzo(a,h)anthracene	0 33	0 33	0 02	< 0 33			None	0 0002		Not Detected, Delineate with other PAHs	B725E, B504S, B703W	Delineate N (WT < 15')		B767N-10'
66	B726-10'	SW8270	Dibenzo(a,h)anthracene	0 33	0 33	0 02	1 7 U			None	0 0002		Elevated reporting limit, Delineate W with other PAHs	B724N-10', B725E-5', B704S	Delineate W		B763W-10'
67	B720C-0'	SW8310	Dibenzo(a,h)anthracene	0 02	0 02	0 02	0.05			None	0 0002		Std 3, Need Delineation to S	B831N, B508E, B721W	Need Delineation to S		B771S-0'
68	B723B-0'	SW8310	Dibenzo(a,h)anthracene	0 02	0 02	0 02	0 64			None	0 0002		Std 3, Need confirmation/SPLP and Delineation E and S	B831N, B722W	Confirmation/SPLP, Delineate E and S	B765-0'	B767E-0', B771S-0'
69	B724-5'	SW8310	Dibenzo(a h)anthracene	0 02	0 02	0 02	0 057 J			None	0 0002		Std 3, Need Delineation N and E	B725S, B703W	Need Delineation N and E		B767N-5', B766E-5'
70	B725-0'	SW8310	Dibenzo(a,h)anthracene	0 02	0 02	0 02	0 092 F			None	0 0002		Std 3, Need Delineation N and E	B504S, B722W	Need Delineation N and E		B767N-0', B766E-0'
71																	
72	B701-0'/B718-0'	SW8270/SW8310	Indeno(1,2,3-c,d)pyrene	0 33	0 33	0 039	0 7	0 46		0 00042 U	0 00039	0 46	Confirmed at SS MSC, Need Delineation to S	B831N, B504E, BB721W	Confirmation/SPLP, Delineate S	B770-0'	B771S-0'
73	B728-0'	SW8270	Indeno(1,2,3-c,d)pyrene	0 33	0 33	0 039	2.8			None	0 00039	0 46	Std 3, Need confirmation/SPLP and Delineation to S	B831N, B504E, BB721W	Confirmation/SPLP, Delineate S	B770-0'	B771S-0'
74	B703-0'/B729-0'	SW8270/SW8310	Indeno(1,2,3-c,d)pyrene	0 33	0 33	0 039	< 0 33	0 25 F		None	0 00039	0 46	< RRS-1, Delineate with other PAHs	B504S, B722W	Delineate N and E		B767N-0', B766E-0'
75	B702-15'	SW8270/SW8310	Indeno(1,2,3-c,d)pyrene	0 33	0 33	0 039	0 36 F			None	0 00039	0 46	< SS MSC, Need Delineation N	B725E, B504S, B703W	Delineate N		B767N-15'
76	B726-10'	SW8270	Indeno(1,2,3-c,d)pyrene	0 33	0 33	0 039	1 7 U			None	0 00039	0 46	Elevated reporting limit, Delineate W with other PAHs	B724N-10', B725E-5', B704S	Delineate W		B763W-10'
77	B720C-0'	SW8310	Indeno(1,2,3-c,d)pyrene	0 03	0 039	0 039	0 048 F			None	0 00039	0 46	< SS MSC Need Delineation to S	B831N, B508E, B721W	Need Delineation to S		B771S-0'
78	B723B-0'	SW8310	Indeno(1,2,3-c,d)pyrene	0 03	0 039	0 039	0 99 F			None	0 00039	0 46	Std 3, Need confirmation/SPLP and Delineation E and S	B831N, B722W	Confirmation/SPLP, Delineate E and S	B765-0'	B767E-0', B771S-0'
79	B724-5'	SW8310	Indeno(1,2,3-c d)pyrene	0 03	0 039	0 039	0 075 J			None	0 00039	0 46	< SS MSC, Need Delineation N and E	B725S, B703W	Need Delineation N and E		B767N-5', B766E-5'
80	B725-0'	SW8310	Indeno(1,2,3-c,d)pyrene	0 03	0 33	0 039	0 074 F			None	0 00039	0 46	< SS MSC, Need Delineation N and E	B504S, B722W	Need Delineation N and E		B767N-0', B766E-0'

Note: NVBKD - Natural Variation of Background
na - not analyzed
RRS - Risk Reduction Standards
SPLP - Synthetic Precipitation Leaching Procedure
SS MSC - Site-Specific Medium Specific Concentrations
MSC - Medium Specific Concentration
GWP MSC - Groundwater Protection MSC
GW MSC - Groundwater MSC
Yellow indicates Standard 3 detections above SS MSC
* - SAI MSC
NV - No value
WT - Water Table

Table 3.2
SWMU 17 / Landfill 7
Standard 2 Soil Issues

Row	Location	Method	Analyte	RRS-1	RRS-2	Result	Duplicate Result	Note	Delineation	Action	Proposed Location(s)
1	B703-15'	SW6010	Barium	128.1	200	167		Need Delineation to S	B723N, B702E, B722W	Delineate	B761S-15'
2	B703-15'	SW6010	Cobalt	6.19	613	7.2		Isolated Std 2 Detection - not enough samples for 5 % Rule; Delineated	B723N, B702E, B701S, B722W	None	
3	B701-5'	SW6010	Copper	13.72	130	92		Isolated Std 2 Detection - not enough samples for 5 % Rule; Delineate W	B703N, B504E, B704S	Delineate	Obtain Data from B721W-5'
4	B703-5'	SW7471	Mercury	0.035	0.2	0.1 J		Delineated	B723bN, B702E, B701S, B722W	None	
5	B704-0'/B727-0'	SW7471	Mercury	0.14	0.2	0.42 J	0.03 F 0.04	Not confirmed above background; Delineated	B701N, B504E, B716S, B717W	None	
6	B703-5'	SW6010	Silver	0.128	51	0.61 F		Isolated detection, Natural Variation of Background	B816N, B702E, B701S; not to west	None	
7	B701-5'	SW6010	Zinc	31.3	3100	310 J		Delineated	B703N, B507E, B704S, B721W	None	
8	B702-0'	SW6010	Zinc	38.8	3100	45.2 J		Natural Variation of background	B704S	None	
9	B702-5'	SW6010	Zinc	31.3	3100	38.4 J		Natural Variation of background	B704S, B703W, B721W	None	
10	B702-15'	SW6010	Zinc	31.3	3100	31.6 J		Natural Variation of background	B704S, B703W, B721W	None	
11	B703-0'	SW6010	Zinc	38.8	3100	55.2 J		Natural Variation of background	B704S	None	
12	B701-5'	SW8080	p,p'-DDE	0.003	0.084	0.061 J		Std 2; Delineated	B703N, B504E, B704S, B721W	None	
13	Various 7x detect	SW8260	Acetone	0.005	1000	< 0.19		Lab artifact		None	
14	Various 2x detect	SW8260	Methyl Ethyl Ketone	0.005	6132	< 0.33		Lab artifact		None	
15	B735-10'	SW8260	Acrylonitrile	0.054	180^	1.1		Isolated Std 2 Detection; Delineated	B739N, BB745E, B701S, B703W	None	
16	B735-10'	SW8260	Bromomethane	0.006	14	0.38		Isolated Std 2 Detection; Delineated	B739N, BB745E, B701S, B703W	None	
17	B735-10'	SW8260	Chloromethane	0 006	22	0 041 F		Isolated Std 2 Detection; Delineated	B739N, BB745E, B701S, B703W	None	
18	B735-10'	SW8260	Ethylbenzene	0.003	70	0.087 F		Isolated Std 2 Detection, Delineated	B739N, BB745E, B701S, B703W	None	
19	B735-10'	SW8260	m,p-xylene	0.005	1000	0.22		Isolated Std 2 Detection; Delineated	B739N, BB745E, B701S, B703W	None	
20	B735-10'	SW8260	o-xylene	0.005	1000	0.082 F		Isolated Std 2 Detection; Delineated	B739N, BB745E, B701S, B703W	None	
21	B735-10'	SW8260	Propane Nitrile	0.022	180^	1.3		Isolated Std 2 Detection; Delineated	B739N, BB745E, B701S, B703W	None	
22	B702-5'	SW8270	Std 2 PAHs	0.33	0.33	na		Need Delineation N	B725E, B504S, B703W	Delineate	B767N-5'
23	B720C-0'	SW8310	Std 2 PAHs	na	na	na		Need Delineation to S	B831N, B508E, B721W	Delineate	B771S-0'
24	B723B-0'	SW8310	Std 2 PAHs	na	na	na		Need Delineation E and S	B831N, B722W	Delineate	B767E-0', B771S-0'
25	B724-5'	SW8310	Std 2 PAHs	na	na	na		Need Delineation N and E	B725S, B703W	Delineate	B767N-5', B766E-5'
26	B725-0'	SW8310	Std 2 PAHs	na	na	na		Need Delineation N and E	B504S, B722W	Delineate	B767N-0', B766E-0'

Note: RRS - Risk Reduction Standards
^ - SAI MSC
na - not analyzed

Table 3.3
SWMU 17 / Landfill 7
Mobile Laboratory Data

ESN Project#T2-000411

Volatile Aromatic Hydrocarbons by USEPA Method 8021B - Analyses of Waters

Sample ID	Method Blank	P-704	B-704	P-732	P-733	P-734	P-734	Method Blank	P-735	FT08-11B
Sampling Time	---	9:05	11:34	13:00	15:07	16:07	16:07	---	10.40	10:12
Analysis Date	4/11/00	4/11/00	4/11/00	4/11/00	4/11/00	4/11/00	4/12/00	4/12/00	4/12/00	4/12/00
Analysis Time	9:29	10:36	11:56	13:29	15:54	16:31	12:40	9:29	11:09	11:39
Dilution Factor	1	1	1	1	1	1	1	1	1	1
Compounds: (mg/L)										
Benzene	U	3.60	3.40	U	U	13.3	2.00	U	26.3	U
Isopropylbenzene	U	U	U	U	U	U	U	U	28.9	U
n-propylbenzene	U	U	U	U	U	U	U	U	46.7	U
Tert-butylbenzene	U	U	U	U	U	NA	U	U	42.5	U
Sec-butylbenzene	U	U	14.4 (TIC)	U	U	NA	U	U	81.7	U
P-isopropyltoluene	U	U	U	U	U	NA	U	U	36.8	U
TFT Surrogate Recovery (%)	78	99	103	89	86	95	103	115	124	101
BFB Surrogate Recovery (%)	69	83	106	95	87	124	95	109	94	96

Table 3.3
SWMU 17 / Landfill 7
Mobile Laboratory Data

ESN Project#T2-000411

Sample ID	P-736	WITCTA039	Method Blank	P-737	P-738	LF05-5B	P-724	P-738	P-739	FT08-11A	P-740
Sampling Time	12:40	15:50	---	17:35	16:35	9:24	9:50	11:20	11:30	13:45	14:15
Analysis Date	4/12/00	4/12/00	4/13/00	4/13/00	4/13/00	4/13/00	4/13/00	4/13/00	4/13/00	4/13/00	4/13/00
Analysis Time	13:36	16:17	8:28	9:13	9:36	10:29	10:53	11:49	12:37	14:17	14:46
Dilution Factor	1	1	1	1	1	1	1	1	1	1	1
Compounds: (mg/L)											
Benzene	U	U	U	U	1.34 E	U	U	1.10 E	U	U	U
Isopropylbenzene	U	U	U	U	U	U	U	U	U	U	U
n-propylbenzene	U	U	U	U	U	U	U	U	U	U	U
Tert-butylbenzene	U	U	U	U	U	U	U	U	U	U	U
Sec-butylbenzene	U	U	U	U	U	U	U	U	U	U	U
P-isopropyltoluene	U	U	U	U	U	U	U	U	U	U	U
TFT Surrogate Recovery (%)	97	83	91	93	94	88	95	89	78	86	88
BFB Surrogate Recovery (%)	87	73	69	95	102	91	92	85	104	99	104

Table 3.3
SWMU 17 / Landfill 7
Mobile Laboratory Data

ESN Project#T2-000411

Sample ID	P-741	WHGLTA702	Method Blank	P-742	WHGLTA002	P-743	P-744	P-745	P-746	Method Blank
Sampling Time	16:15	16:15	---	9:50	9:56	12.00	14:10	16:00	17:00	---
Analysis Date	4/13/00	4/13/00	4/14/00	4/14/00	4/14/00	4/14/00	4/14/00	4/14/00	4/14/00	4/17/00
Analysis Time	16:40	17:08	8:38	10:16	12:30	12:55	14:37	17:28	17:53	8:35
Dilution Factor	1	1	1	1	1	1	1	1	1	1
Compounds: (mg/L)										
Benzene	2.61	U	U	U	U	U	U	33.5	7.10	U
Isopropylbenzene	21.8	U	U	U	U	U	U	U	3.12	U
n-propylbenzene	32.0	U	U	U	U	U	U	79 8	U	U
Tert-butylbenzene	NA	U	U	U	U	U	U	NA	U	U
Sec-butylbenzene	NA	U	U	U	U	U	U	129	9.66	U
P-isopropyltoluene	35.3	U	U	U	U	U	U	U	U	U
TFT Surrogate Recovery (%)	NA	83	103	101	117	108	87	NA	NA	88
BFB Surrogate Recovery (%)	91	96	92	114	128	105	90	105	86	81

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Table 3.3
SWMU 17 / Landfill 7
Mobile Laboratory Data

ESN Project#T2-000411

Sample ID	P-747	P-748	P-749	P-750	P-751	P-752	P-753
Sampling Time	9:38	10:35	11:25	13:55	14:58	16:02	18:32
Analysis Date	4/17/00	4/17/00	4/17/00	4/17/00	4/17/00	4/17/00	4/17/00
Analysis Time	10:07	11:05	1:55	14:18	16:00	16:27	18:57
Dilution Factor	1	1	1	1	1	1	1
Compounds: (mg/L)							
Benzene	U	2.00	U	U	U	U	U
Isopropylbenzene	U	U	U	U	U	U	U
n-propylbenzene	U	U	U	U	U	U	U
Tert-butylbenzene	U	U	U	U	U	U	U
Sec-butylbenzene	U	U	U	U	U	U	U
P-isopropyltoluene	U	U	U	U	U	U	U
TFT Surrogate Recovery (%)	92	108	110	92	92	86	82
BFB Surrogate Recovery (%)	98	113	114	106	106	106	90

Acceptable surrogate recovery: 65-135%

Method Reporting Limits 2.00ug/L (ppb)
U= Indicates Compound Not Detected
TIC= Indicates Tentatively Identified Compound
NA= Indicates not availabe due to peak interference
E = Indicates results outside calibration limits

Analyses performed on site in ESN's Mobile Environmental Laboratory
Analyses performed by: Richard Rodriguez
Data Reviewed by: Richard Rodriguez

Notes: Concentrations for some of the target compounds may be enhanced by coeluting compounds

Table 3.4
SWMU 28 / Landfill 1
Standard 3 Soil Issues

Row	Location	Method	Analyte	RRS-1	RRS-2	GWP MSC	Result	Confirm Result	SPLP Result	GW MSC	SS MSC	Note	Delineation	Action	Confirmation Boring	Proposed Delineation Boring(s)
1	B101-10'	SW7041	Antimony	0 712	0 712	0.6	4 9	None	0 005 UJ	0 006	4 9	Result = SS MSC, Need delineated to N	RiverE, LF01-1ES, LF01-1BW	Delineate to North		B110-10'
2	B102-10'	SW7041	Antimony	0.712	0.712	0.6	1.8	None	None	0.006	4 9	SS MSC, North delineation rejected	RiverE, W103S, B106W	Delineate to North		B110-10'
3	W102-0'	SW6010	Antimony	0 56	0 56	0.6	0.84			0.006	4 9	Standard 3 detection	RiverE, W103S, B107W(Bedrock)	Delineate to North		B110-0'
4	W102-5'	SW6010	Antimony	0.712	0 712	0.6	1.4			0.006	4 9	Standard 3 detection, Delineated	W101N,RiverE, W103S, B107W(Bedrock)	None		
5	W101-15'	SW6010	Antimony	0 712	0 712	0 6	2 3			0 006	4 9	Standard 3 detection, Delineated	B105N, RiverE, LF01-1CS,LF01-1EW	None		
6	LF01-1F-20'	SW6010(ICP)	Antimony	0.712	0 712	0 6	6			0 006	4 9	Detection > SS MSC, Delineated-(Bedrock	W101N, RiverE, LF01-1DS, B107W(Bedrock)	Confirmation/SPLP	LF01-1F-20'	
7	W101-15'	SW6010	Arsenic	6 58	5 58	5	11.8			0.05		Not confirmed- Water Table?	RiverE, LF01-1ES, B106W-(Bedrock)	Confirmation/SPLP	W101-15'	Delineate if confirmed
8	LF01-1F-20'	SW7060(GFAA)	Arsenic	6 58	5.58	5	7 6			0 05		ICP -30 mg/kg; GFAA - 7 6 mg/kg	W101N, W102E, W103S, LF01-1CW	Confirmation/SPLP	LF01-1F-20'	
9	LF01-1D-20'	RCRA Metals	Arsenic	6 58	5 58	5	11			0 05		Matrix interference with SW6010-std	W102N, W104E, B108S(Bedrock), B107W(Bedrock)	None		
10	W101-15'	SW6010	Barium	128 1	200	200	482			2		Delineated,but need SS MSC	B105N, RiverE, LF01-1CS, LF01-1EW	Confirmation/SPLP	W101-15'	
11	W101-15'	SW6010	Cadmium	0 59	0 59	0 5	8 9			0 005	19 6	Delineated,but need SS MSC	B105N, RiverE, LF01-1CS, LF01-1EW	Confirmation/SPLP	W101-15'	
12	B102-10'	SW6010	Cadmium	0 59	0.59	0 5	19 6	None	0 0011F	0 005	19 6	New SSMSC, Delineated	B105N, RiverE, W103S, B106W	None		
13	W102-5'	SW6010	Cadmium	0 59	0 59	0 5	4 4			0.005	19 6	Standard 3 detection, Delineated	W101N, RiverE, W104S, B107W	None		
14	W103-0'/B103-0'	SW6010	Cadmium	0 556	0.556	0 5	0.98	0 76		0.005	19 6	Delineated; SPLP rejected, need SS MSC	W102N, RiverE, B108W, W104S	Confirmation/SPLP	W103-0'	
15	W101-15'	SW6010	Chromium	16 31	16 31	10	25 5			0 1	45 3	< SSMSC, Need delineation to N	RiverE, W103S, B106W-(Bedrock)	Obtain result from B105-15'		
16	W104-25'	SW6010	Chromium	16 31	16 31	10	16 6			0 1	45 3	Run w/ICP-Trace; < SSMSC, Natural Variation of Background		None		
17	LF01-1B-10'	RCRA Metals	Chromium	16 31	16 31	10	22			0 1	45 3	Run w/ICP-Std, Matrix Interference; NVBKGD		None		
18	W102-5'/B102-5'	SW6010	Chromium	16 31	16 31	10	110	45 3	0.002 UJ	0.1	45 3	Confirmation < original, = SSMSC, Delineated	W101N, RiverE, W104S, B107W	None		
19	B102-10'	SW6010	Chromium	16 31	16 31	10	29.4	29 4	0 002 UJ	0 1	45 3	< SSMSC, Delineated	B101N, RiverE, W103S, B107W -(Bedrock)	None		
20	W102-20'	SW6010	Chromium	16 31	16.31	10	17 9	None		0 1	45.3	< SSMSC, Delineated	W101N, RiverE, W103S, B107W-(Bedrock)	None		
21	B101-5'/W101-5'	SW7421	Lead	12 66	12 66	1 5	46 8	157	0 0065 F	0 015	157	Confirmed > SS MSC; Need delineation to W	B105N, RiverE, W103S	Delineate to West		B113-5'
22	B101-10'	SW7421	Lead	12 66	12.66	1 5	57	62 2	0 0054	0 015	157	Both passed SPLP, delineated	B105N, RiverE, W103S, B106W	None		
23	W101-15'	SW6010	Lead	12.66	12 66	1.5	327			0 015	157	Confirm/SPLP, Delineated	B105N, RiverE, LF01-1CS, LF01-1EW	Confirm/SPLP	W101-15'	
24	B106-5'	SW7421	Lead	12.66	12 66	1 5	33 1			0 015	157	< SSMSC, need delineation to West	B105N, RiverE, B107S	Delineate to West		B113-5'
25	W102-5'/B102-5'	SW6010/SW7421	Lead	12 66	12 66	1.5	180	2080 F	None	0.015	157	Standard 3	B105N, RiverE, W103S, B107W	None, Risk assesment		
26	B102-10'	SW7421	Lead	12 66	12 66	1 5	2270		None	0 015	157	Standard 3	B105N, RiverE, LF01-1DS, B106W	None; Risk assesment		

Table 3.4
SWMU 28 / Landfill 1
Standard 3 Soil Issues

Row	Location	Method	Analyte	RRS-1	RRS-2	GWP MSC	Result	Confirm Result	SPLP Result	GW MSC	SS MSC	Note	Delineation	Action	Confirmation Boring	Proposed Delineation Boring(s)
27	W103-0'/B103-0'	SW6010/SW7421	Lead	30 97	30 97	1 5	302	327	None	0.015	157	Confirm/SPLP, Delineated	W102N, RiverE, B109S, B108W	Confirmation/SPLP	W103-0'/B103-0'	
28	W104-0'	SW6010	Lead	30 97	30 97	1.5	33 8		None	0 015	157	< SSMSC; Delineated	B102N, RiverE, B109S, B108W	None		
29	W101-15'	SW6010	Selenium	0.313	5	5	0.49 F			0 05		Std 2, Delineated	D105N, RiverE, W102S, B106W (Bedrock)	None		
30	W102-20'	SW6010	Selenium	0.313	5	5	0 39F			0 05		Std 2, Delineated	W101N, RiverE, W103S, B107W (Bedrock)	None		
31	LF01-1B-10'	RCRA Metals	Selenium	0 313	5	5	17			0 05		Matrix interference with SW6010-std	B105N, LF01-1E, B106S	Confirmation/SPLP	LF01-1B-10'	Delineate if confirmed at Std2/3
32	LF01-1B-20'	RCRA Metals	Selenium	0 313	5	5	16.0			0 05		Matrix interference with SW6010-std	B105N, W101E, W103S	Delineate if confirmed at Std2/3 at LF01-1B-10'		
33	LF01-1C-15'	RCRA Metals	Selenium	0.313	5	5	10			0 05		Matrix interference with SW6010-std	B105N, W102E, W103S	None		
34	LF01-1D-10'	RCRA Metals	Selenium	0 313	5	5	12 0			0 05		Matrix interference with SW6010-std	LF01-1EN, W103E, B108S, B106W	None		
35	LF01-1D-20'	RCRA Metals	Selenium	0 313	5	5	7 0			0 05		Matrix interference with SW6010-std	W101N, W103E	None		
36	W102-0'	SW8080	PCB1254	0 0088	0 05	0 05	1 1F	0 0093 0 0088 U		0 0005		Confirmed at PQL, not in duplicate, therefore Std 2, Delineate W	RiverN, RiverE, W103S	Delineate to West		B114W-0'
37	B102-10'	SW8080	PCB1254	1	1	0.05	0 033			0 0005		Std 2 - delineated by (Bedrock) at B107-10'	LF01-1BN, RiverE, W103S, B107W	Collect sample above (Bedrock)		B107-9'
38	B107-0'	SW8082	PCB1254	1	1	0 05	0 14			0.0005		Need SS-MSC; Delineation to W and N	W103E, W104S	Confirmation/SPLP, Delineate N andW	B107-0'	B114W-0', B110N-0'
39	W101-15'	SW8080	DDD	0 007	0 12	0 12	0 28			0 0012		Need SS-MSC; Delineated	B105N, RiverE, W102S, LF01-1EW	Confirmation/SPLP	W101-15'	
40	W101-15'	SW8080	DDE	0 007	0 084	0.084	0 17			0 00084		Need SS-MSC, Delineated	B105N, RiverE, W102S, LF01-1EW	Confirmation/SPLP	W101-15'	
41	W101-5'/B101-5'	SW8270/SW8310	Benzo(a)anthracene	0 33	0 33	0 039	0 43	0 063	na	0 00039		Need SS-MSC, Delineation W of B106	B105N, RiverE, W102S,	Confirmation/SPLP	W101-5'/B101-5'	Delineate W of B106-5' as PAHs
42	B101-10'	SW8310	Benzo(a)anthracene	0 33	0 33	0 039	0 099 J	0 2 J	rejected	0 00039		Need SS-MSC	B105N, RiverE, LF01-1DS, LF01 1BW	Confirmation/SPLP	B101-10'	
43	B106-5'	SW8310	Benzo(a)anthracene	0 33	0 33	0 039	0 11		na	0 00039		Need SS-MSC, Delineate to W	B105N, RiverE, B103S	Confirmation/SPLP, Delineate W	B106-5'	B113-5' as PAHs
44	W101-5'/B101-5'	SW8270/SW8310	Benzo(a)pyrene	0 33	0 33	0 02	0 35 F	0 098	na	0 00023		Need SS-MSC; Delineation W of B106	B105N, RiverE, W102S	Confirmation/SPLP	W101-5'/B101-5'	Delineate W of B106-5'
45	B101-10'	SW8310	Benzo(a)pyrene	0 33	0 33	0 02	0 11 J	0 2 J	rejected	0 00023		Need SS-MSC	B105N, RiverE, W103S, LF01-1BW	Confirmation/SPLP	B101-10'	
46	B106-5'	SW8310	Benzo(a)pyrene	0 33	0 33	0 02	0 12		na	0 00023		Need SS-MSC, Delineate to W	B105N, RiverE, B103S	Confirmation/SPLP, Delineate to	B106-5'	B113-5' as PAHs
47	B101-5'	SW8310	Benzo(b)fluoranthene	0 33	0 33	0.039	0 33 U	0 096	na	0 00039		Need SS-MSC, Delineation W of B106	B105N, RiverE, W102S	Confirmation/SPLP	B101-5'	Delineate W of B106-5' as PAHs
48	B101-10'	SW8310	Benzo(b)fluoranthene	0 33	0 33	0 039	0 097	0 26 F	rejected	0 00039		Need SS-MSC	B105N, RiverE, W103S, LF01-1BW	Confirmation/SPLP	B101-10'	
49	B106-5'	SW8310	Benzo(b)fluoranthene	0 33	0 33	0.039	0.15 F		na	0 00039		Need SS-MSC, Delineate to W	B105N, RiverE, W103S	Confirmation/SPLP, Delineate to	B106-5'	B113-5' as PAHs
50	W101-5'	SW8270	Benzo(k)fluoranthene	0 33	0 33	0 39	0 43	0 051 F	na	0.0039		Need SS-MSC, Delineate to W	B105N, RiverE, W102S	Confirmation/SPLP, Delineate to	W101-5'	Delineate W of B106-5' as PAHs
51	B101-5'	SW8310	Dibenzo(a,h)anthracene	0 33	0 33	0 02	0 33 U	0 15	na	0 0002		Need SS-MSC; Delineation W of B106	B105N, RiverE, W102S	Confirmation/SPLP	B101-5'	Delineate W of B106-5' as PAHs
52	B101-10'	SW8310	Dibenzo(a,h)anthracene	0 33	0.33	0 02	0 066 F	0 1 F	na	0 0002		Need SS-MSC	B105N, RiverE, W103S, LF01-1BW	Confirmation/SPLP	B101-10'	
53	B106-5'	SW8310	Dibenzo(a,h)anthracene	0 33	0 33	0 02	0 066		na	0 0002		Need SS-MSC; Delineate to W	B105N, RiverE, W102S	Confirmation/SPLP, Delineate to	B106-5'	B113-5' as PAHs
54	B101-5'	SW8310	Indeno(1,2,3-c,d)pyrene	0 33	0.33	0.039	0.33 U	0 093		0 00039		Need SS-MSC, Delineation W of B106	B105N, RiverE, W102S	Confirmation/SPLP	B101-5'	Delineate W of B106-5' as PAHs
55	B101-10'	SW8310	Indeno(1,2,3-c,d)pyrene	0.33	0 33	0 039	0 073 F	0 15 F		0 00039		Need SS-MSC	B105N, RiverE, W103S, LF01-1BW	Confirmation/SPLP	B101-10'	
56	B106-5'	SW8310	Indeno(1,2,3-c,d)pyrene	0 33	0 33	0 039	0 086 F			0.00039		Need SS-MSC, Delineate to W	B105N, RiverE, W102S	Confirmation/SPLP, Delineate to	B106-5'	B113-5' as PAHs

Note: NVBKD - Natural Variation of Background
na - not analyzed

SS MSC - Site-Specific Medium Specific Concentrations
MSC - Medium Specific Concentration

RRS - Risk Reduction Standards
SPLP - Synthetic Precipitation Leaching Procedure

Table 3.5
SWMU 28 / Landfill 1
Standard 2 Soil Issues

Row	Location	Method	Analyte	RRS-1	RRS-2	Result	Confirm Result	Note	Delineation	Action	Delineation Location
1	W104-25'	SW6010	Cobalt	6.19	613	6.9		Natural Variation of Background		None	
2	W104-30'	SW6010	Cobalt	6.19	613	6.5		Natural Variation of Background		None	
3	W102-15'	SW6010	Copper	13.72	130	120		Delineated	B105N, RiverE, LF01-1FS, LF01-1EW	None	
4	W102-0'	SW6010	Copper	17.37	130	21.6 F		Delineated	River N, River E, W103S, B107W	None	
5	W102-5'	SW6010	Copper	13.72	130	90		Delineated	W101N, River E, W103S, B107W	None	
6	W101-15'/B101-15'	SW7471	Mercury	0.035	0.2	0.2	0.03 F 0.04 U	Delineated	B105N, RiverE, W104S, LF01-1EW	None	
7	LF01-1C-15'	SW7471	Mercury	0.035	0 2	0.12		Need delineation to W; most likely Bedrock	LF01-1EN, W102E, W104S	Delineate	B113-15'
8	LF01-1C-25'	SW7471	Mercury	0 035	0.2	0.17		Need delineation to W; most likely Bedrock	B101N (by WT), W102E, W104S	Delineate	B113-25'
9	LF01-1D-10'	SW7471	Mercury	0.035	0.2	0.06		Natural Variation of Background	B106N, W103E, B108S	None	
10	LF01-1D-20'	SW7471	Mercury	0.035	0.2	0.08		Natural Variation of Background	LF01-1FN, W103E	None	
11	W102-5'	SW6010	Nickel	19.76	200	65.1		Delineated	B101N, RiverE, W103S, B107W	None	
12	W101-15'	SW6010	Nickel	19.76	200	23.7		Delineated	B105N, RiverE, W103S, LF01-1EW	None	
13	B109-0'	SW6010	Silver	0.213	51.1	1.9		Delineate to S	W103N, RiverE, B108W	Delineate	B111-0'
14	LF01-1D-10'	SW6010	Silver	0 128	51.1	12		Need delineation to W; most likely Bedrock	B105N, W103E, B108S	Delineate	B114-10'
15	LF01-1D-20'	SW6010	Silver	0.128	51.1	7		Need delineation to W; most likely Bedrock	W102N, W103EB109S(Bedrock)	Delineate	B114-20'
16	LF01-1C-10'	SW6010	Silver	0.128	51.1	1.4		Need delineation to W; most likely Bedrock	B105N, RiverE, B108S	Delineate	B113-10'
17	LF01-1C-25'	SW6010	Silver	0.128	51.1	1.4		Need delineation to W; most likely Bedrock	B101N(by WT), RiverE, W104S	Delineate	B113-25'
18	LF01-1E15'	SW6010	Silver	0.128	51 1	1.8		Delineated by Bedrock at B106	B105N(by background), RiverE, W103S, B106W(Bedrock)	None	
19	LF01-1B-20'	SW6010	Silver	0.128	51.1	1.7		Need delineation to W; most likely Bedrock	B105N, W101E, B108S	Delineate	B114-20'
20	B105-15'	SW6010	Silver	0.128	51.1	0.15 F		Natural Variation of Background	RiverE, W103S	None	
21	W103-0'/B103-0'	SW9030	Sulfide	25	NV	ns	111 SJ	No MSC; Possibly produced by natural sources	W102N, RiverE, W104S	Delineate	B114-0'
22	W102-5'	SW6010	Tin	10	6100	15.3		Delineated	W101N, River E, W103S, B107W	None	
23	W101-15'	SW6010	Tin	10	6100	78.4		Delineated	B105N, RiverE, W103S, LF01-1EW	None	
23	W102-5'	SW6010	Zinc	31.3	3066	1090		Standard 2 Detection	W101N, RiverE, W103S, B107W	None	
24	W104-25'	SW6010	Zinc	31.3	3066	41.3		Natural Variation of Background	W102N, RiverE	None	
25	W104-30'	SW6010	Zinc	31.3	3066	33.2		Natural Variation of Background	RiverE	None	
26	W101-15'	SW8080	DDE	0.007	0.084	0.024 F	0.17	Delineated	B105N, RiverE, W102S, LF01-1CW	None	
27	W101-15'	SW8260	Acetone	0.005	1000	0.28		Lab artifact	RiverE, LF01-1CS	None	
28	W102/W103-subsurface	SW8260	Acetone	0.005	1000	0 00X		Lab artifact		None	None
29	W101-15'	SW8260	Benzene	0.002	0.5	0.01 J		Low Std 2 detection; Delineate to N and W	RiverE, LF01-1CS	Delineate	B110-15', B112-15'
30	W101-20'	SW8260	Benzene	0 002	0.5	0.009		Low Std 2 detection; Delineate to N and W	RiverE, LF01-1CS	Delineate	B110-20', B112-20'
31	W101-15'	SW8260	MEK	0 005	6100	0.048 J		Lab artifact	RiverE, LF01-1CS	None	
32	W101-20'	SW8260	MEK	0.005	6100	0.007		Lab artifact	RiverE, LF01-1FS	None	
33	B106-5'	SW8310	PAHs	0.33	0.33	NA	NA	Delineate Std 2 PAHs with Std 3 PAHs to W B106		Delineate	B113-5'

Note: ND - Not Detected, Reporting Limit below MSC
na - Not analyzed
ns - Not sampled
RRS - Risk Reduction Standards
SPLP - Synthetic Precipitation Leaching Procedure
SS MSC - Site-Specific Medium Specific Concentrations
MSC - Medium Specific Concentration
GWP MSC - Groundwater Protection MSC
GW MSC - Groundwater MSC
NVBKD - Natural Variation of Background
WT - Water Table
NV - No Value

Table 3.6
SWMU 28 / Landfill 1
Characterization Issues

Row	Location	Methods	Appix IX List	Matrix	Purpose
1	EUHGL101	SW6010-tr, SW7471, SW8080, SW8260, SW8310	Metals, Mercury, Pests/PCBs, VOCs, PAHs	Surface Water	Upgradient Sample from Trinity River
2	EUHGL101	SW6010-tr, SW7471, SW8080, SW8260, SW8310	Metals, Mercury, Pests/PCBs, VOCs, PAHs	Sediment	Upgradient Sample from Trinity River Bed
3	EUHGL102	SW6010-tr, SW7471, SW8080, SW8260, SW8310	Metals, Mercury, Pests/PCBs, VOCs, PAHs	Surface Water	Downgradient Sample from Trinity River
4	EUHGL102	SW6010-tr, SW7471, SW8080, SW8260, SW8310	Metals, Mercury, Pests/PCBs, VOCs, PAHs	Sediment	Downgradient Sample from Trinity River Bed
5	EUHGL103	SW6010-tr, SW7471, SW8080, SW8260, SW8310	Metals, Mercury, Pests/PCBs, VOCs, PAHs	Surface Water	Downgradient Sample from Trinity River
6	EUHGL103	SW6010-tr, SW7471, SW8080, SW8260, SW8310	Metals, Mercury, Pests/PCBs, VOCs, PAHs	Sediment	Downgradient Sample from Trinity River Bed
7	EUHGL104	SW6010-tr, SW7471, SW8080, SW8260, SW8310	Metals, Mercury, Pests/PCBs, VOCs, PAHs	Surface Water	Downgradient Sample from Trinity River
8	EUHGL104	SW6010-tr, SW7471, SW8080, SW8260, SW8310	Metals, Mercury, Pests/PCBs, VOCs, PAHs	Sediment	Downgradient Sample from Trinity River Bed
9	B101-0'	SW6010-tr, SW7471, SW8080, SW8260, SW8310	Metals, Mercury, Pests/PCBs, VOCs, PAHs	Soil	Characterization
10	B115-0',5,10', 15', 20', 25	SW6010-tr, SW7471, SW8080, SW8260, SW8310	Metals, Mercury, Pests/PCBs, VOCs, PAHs	Soil	Characterization

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Table 3.7
SWMU 29 / Landfill 2
Standard 3 Soil Issues

Row	Location	Method	Analyte	RRS-1	RRS-2	GWP MSC	Result	Confirm Result	Confirm II Result	SPLP Result	GW MSC	SS MSC	Note	Action	Proposed Confirmation Boring	Delineation Borings	Proposed Delineation Boring(s)
1	B231-0'	SW6010	Antimony	0.56	0.6	0 6	3 2 J	None	na	None	0.006		Not confirmed or delineated to N & W	Confirmation/SPLP, Delineate	B251-0'	B201S, B206E	Obtain data from B237, B248, and B249
2	B231-0'	SW6010	Barium	233	233	200	1710 J	None	na	None	2	506	Delineated, Not Confirmed	Confirmation/SPLP	B251-0'	B248N, B206E, B201S, B237W	Delineated
3	B31001-0'	SW6010	Barium	233	233	200	506	None	na	pass	2	506	Delineated with Proposed IRA-DO15	None		B31006N, B31005E, B31004S, B221W	Delineated
4	B231-0'	SW6010	Cadmium	0 556	0.556	0.5	3 2 J	None	na	None	0 005	1.5	Not confirmed or delineated	Delineate	B251-0'	B201S, B206E	Obtain data from B237, B248, and B249
5	B31001-0'	SW6010	Cadmium	0.556	0 556	0.5	1.5	None	na	pass	0 005	1.5	Delineated with Proposed IRA-DO15	Delineate		B31006N, B31005E, B31004S, B31003W	Obtain data from B237, B248, and B249
6	B231-0'	SW6010	Chromium	25 86	25 86	10	297	None	na	None	0.1	40.6	Delineated, Not Confirmed	Confirmation/SPLP	B251-0'	B248N, B206E, B201S, B237W	Delineated
7	B31001-0'	SW6010	Chromium	25 86	25 86	10	40.6	None	na	pass	0.1	40.6	Delineated	None		B31006N, B31005E, B31004S, B221W	Delineated
8	B231-0'	SW6010	Lead	30 97	30 97	1.5	1530 J	None	na	None	0 015	44.4	Delineated; Not Confirmed	Confirmation/SPLP	B251-0'	B248N, B206E, B239S, B237W	Delineated
9	B229-0'	SW6010	Lead	30 97	30.97	1.5	35 9 F	44.4 J	na	0.00138	0 015	44.4	LF-2 SS-MSC	None		B206N, B202E, B239S, B237W	Delineated
10	B31001-0'	SW7471	Mercury	0.035	0.2	0 2	0 57	None	na	pass	0 002	0.57	Delineated with Proposed IRA-DO15			B31001E, B206S	B257N, B258W
11	B231-0'	SW8080	Aldrin	0 0017	0 0017	0 0017	0.015 J	None	na	None	0 000017		Delineated; Not Confirmed	Confirmation/SPLP	B251-0'	B248N, B206E, B201S, B237W	Delineated
12	B201-0'	SW8080	Heptachlor Epoxide	0 06	0 06	0 06	0.11 F	3 4 U	0 01 U	0 00079 U	0 00083		Passed SPLP	None		B206N, B202E, B239S, B237W	Delineated
13	B201-10'	SW8080	Heptachlor Epoxide	0.06	0 06	0 06	0 65 F	3 2 UJ	0 9 U	0 00078 U	0 00083		NC 2x; PQL > MSC; Passed SPLP	None		B206N, B202E, B239S, B237W	Delineated
14	B201-15'	SW8080	Heptachlor Epoxide	0.06	0 06	0 06	1 0 J	3 2 UJ	O 9 U	0 00079 U	0 00083		NC 2x; PQL > MSC, Passed SPLP	None		B206N, B202E, B239S, B237W	Delineated
15	B201-5'	SW8080	Heptachlor Epoxide	0 06	0 06	0 06	2.6 F	3 2 UJ	0 087 U	0 0008 U	0 00083		NC 2x; PQL > MSC, Passed SPLP	None		B206N, B202E, B239S, B237W	Delineated
16	B231-0'	SW8080	Heptachlor Epoxide	0 06	0 06	0 06	0.23 J	None	na	None	0 00083		Delineated, Not Confirmed	Confirmation/SPLP	B251-0'	B248N, B206E, B238S, B237W	Delineated
17	B201-0'	SW8270	B2EHP	0 33	0 33	0 6	0.78	None	na	None	0 006		Not confirmed or delineated	None			Delineate if confirmed at other locations
18	B204-10'	SW8270	B2EHP	0.33	0 33	0 6	1.8	None	na	None	0 006		Not confirmed or delineated	Confirmation/SPLP	B254-10'		Delineate if confirmed
19	B206-0'	SW8270	B2EHP	0 33	0 33	0 6	1 3	None	na	None	0 006		Not confirmed or delineated	Confirmation/SPLP	B256-0'		Delineate if confirmed
[illegible]	B231-0'	SW8270	B2EHP	0.33	0.33	0 6	1 2 J	None	na	None	0.006		Not confirmed or delineated	Confirmation/SPLP	B251-0'		Delineate if confirmed
[illegible]	B204-0'	SW8270	SVOCs	0.33	0 33		Std 3, 2	None	na	None			Anthropogenic - next to asphalt road	None			
22	B201/B229-10'	SW8270/SW8310	Benzo(a)anthracene	0 33	0 33	0 039	24	37	na	0 00012 U	0 00039	37	LF-2 SS-MSC Highest confirmed detect	None		B206N, B202E, B238S, B239S, B237W	Delineated
23	B201/B229-10'	SW8270/SW8310	Benzo(a)pyrene	0 33	0 33	0 02	20	30	na	0.0011 UJ	0 00023	30	LF-2 SS-MSC Highest confirmed detect	None		B206N, B202E, B238S, B239S, B237W	Delineated
24	B201/B229-10'	SW8270/SW8310	Benzo(b)fluoranthene	0 33	0 33	0 039	22	27 F	na	0 00011 F	0 00039	27	LF-2 SS-MSC Highest confirmed detect	None		B206N, B202E, B238S, B239S, B237W	Delineated
25	B201/B229-5'	SW8270/SW8310	Benzo(b)fluoranthene	0 33	0 33	0 039	33	18 F	na	0 000013 F	0 00039	27	LF-2 SS-MSC Highest confirmed detect	None		B206N, B202E, B238S, B239S, B237W	Delineated
26	B201/B229-10'	SW8270/SW8310	Benzo(k)fluoranthene	0 33	0 33	0 39	12	12	na	0.00081 UJ	0 0039	12	LF-2 SS-MSC Highest confirmed detect	None		B206N, B202E, B238S, B239S, B237W	Delineated
27	B201/B229-10'	SW8270/SW8310	Chrysene	0 33	0 33	3 9	22	33	na	0 00029 F	0 039	33	LF-2 SS-MSC Highest confirmed detect	None		B206N, B202E, B238S, B239S, B237W	Delineated
28	B201/B229-5'	SW8270/SW8310	Chrysene	0 33	0 33	3.9	21	22	na	0 00011 F	0 039	33	LF-2 SS-MSC Highest confirmed detect	None		B206N, B202E, B238S, B239S, B237W	Delineated
29	B201/B229-10'	SW8270/SW8310	Dibenzo(a,h)anthracene	0 33	0 33	0 02	3 F	11 U	na	na	0 0002		Not confirmed, delineated	None		B206N, B202E, B238S, B239S, B237W	Delineated
30	B231-0'	SW8270/SW8310	Dibenzo(a,h)anthracene	0 33	0 33	0 02	4.5 J		na		0.0002		Need SS-MSC	Confirmation/SPLP	B251-0'	B206N, B202E, B238S, B239S, B237W	Delineated
31	B232-7.5'	SW8270/SW8310	Dibenzo(a,h)anthracene	0 33	0 33	0 02	0 53		na		0 0002		Need SS-MSC	Confirmation/SPLP	B252-7.5'	B206N, B202E, B238S, B239S, B237W	Delineated
32	B201/B229-10'	SW8270/SW8310	Indeno(1,2,3-c,d)pyrene	0 33	0 33	0 039	9 9	16 F	na	0 002 UJ	0 00039	16	LF-2 SS-MSC Highest confirmed detect	None		B206N, B202E, B238S, B239S, B237W	Delineated

Note: na - not analyzed
RRS - Risk Reduction Standards
SPLP - Synthetic Precipitation Leaching Procedure
SS MSC - Site-Specific Medium Specific Concentrations
MSC - Medium Specific Concentration
GWP MSC - Groundwater Protection MSC
GW MSC - Groundwater MSC

Table 3.8
SWMU 29 / Landfill 2
Standard 2 Soil Issues

Row	Location	Method	Analyte	RRS-1	RRS-2	Result	Duplicate Result	Note	Delineation	Action	Proposed Delineation Location(s)
1	B202-10'	SW6010	Cobalt	6.19	613	7 F		Isolated STD 2 Detection - 5 % Rule		None	
2	B201-15'	SW6010	Silver	0.128	51.1	0.62 F		Natural Variation of background		None	
3	Various	SW6010	Chromium	16.31	16.31	< 25		SW6010 matrix interference		None	
4	B201-0'	SW6010	Zinc	38.8	3100	67.5		Delineate to S	B206N, B202E, B237W	Delineate	B255S-0'
5	B202-0'	SW6010	Zinc	38.8	3100	42.8		Natural Variation of background		None	
6	B202-5'	SW6010	Zinc	31.3	3100	32		Natural Variation of background		None	
7	B204-0'	SW6010	Zinc	38.8	3100	46.6		Natural Variation of background		None	
8	B31001-15'	SW7471	Mercury	0.035	0.2	0.2		Delineate to N and W	B31001E, B206S	Delineate	B257N-15', B258W-15'
9	B206-10'	SW8260	Acetone	0.005	1000	0.034 J	0.26 J	Suspected Lab artifact		None	
10	B206-10'	SW8260	Ethylbenzene	0.003	70	0.003 U	0.047 J	Not confirmed in parent sample; Delineated	B31002N, B204E, B201S, B231W	None	
11	B206-10'	SW8260	m-xylene	0.005	1000	0.005 U	0.15 J	Not confirmed in parent sample; Delineated	B31002N, B204E, B201S, B231W	None	
12	B206-10'	SW8260	O-xylene	0.005	1000	0.005 U	0.084 J	Not confirmed in parent sample; Delineated	B31002N, B204E, B201S, B231W	None	
13	B245-18.5'	SW8310, TX1005	PAHs, TPH	na	na	na		Delineate to S	B31002N, B244E, B238W	Delineate	B255S-18.5'
14	B253	SW8260, SW8310, TX1005	Vocs, PAHs, TPH	na	na	na		PAHs to differentiate and separate various product types within landfill		Characterize	B253

Note RRS - Risk Reduction Standards
na - not analyzed

Table 3.9
SWMU 26 / Landfill 3
Standard 3 Soil Issues

Row	Location	Method	Analyte	RRS-1	RRS-2	GWP MSC	Result	Duplicate Result	Confirm Result	SPLP Result	GW MSC	SS MSC	Note	Delineation	Action
1	B301-5'	SW6010	Antimony	0.712	0.712	0.6	3.4 F	ND	na	None	0.006		Antimony not detected in duplicate sample	None	None
2	B301-5'	SW6010	Chromium	16.31	16.31	10	19.7	17.5	na	None	0.1		Elevated Conc. due to SW6010-std Matrix Interference	None	None
3	B304-15'/B324-15	SW6010	Lead	12.66	12.66	1.5	247	105 J	na	0.0164	0.015	15	Confirmed at 1/2 original result; failed SPLP; No GW present in this area of Landfill	B331N, B325E, B330S, B301W	None
4	B329-15'	SW6010	Lead	12.66	12.66	1.5	15	None	na	Pass	0.015	15	SS MSC	B331N, B325E, B330S, B301W	None

Note: ND - Not Detected; Reporting Limit below MSC
na - not analyzed
RRS - Risk Reduction Standards
SPLP - Synthetic Precipitation Leaching Procedure
SS MSC - Site-Specific Medium Specific Concentrations
MSC - Medium Specific Concentration
GWP MSC - Groundwater Protection MSC
GW MSC - Groundwater MSC

Table 3.10
SWMU 26 Landfill 3
Standard 2 Soil Issues

Row	Location	Method	Analyte	RRS 1	RRS 2	Result	Note	Action
1	B324-15'	SW6010	Silver	0.128	51	0.14	Natural Variation of Background	None
2	B303-0'	SW6010	Zinc	38.8	3066	49.9	Natural Variation of Background	None
3	B304-0'	SW6010	Zinc	38.8	3066	45.9	Natural Variation of Background	None
4	B303-10'	SW8260	Acetone	0.005	1000	0.076	Lab artifact	None
5	B303-15'	SW8260	Acetone	0.005	1000	0.062	Lab artifact	None
6	B303-20'	SW8260	Acetone	0.005	1000	0.15	Lab artifact	None
7	B304-15'/B324-15'	SW8260	Acetone	0.005	1000	0 032	Lab Artifact; not confirmed in parent sample	None
8	B303-15'	SW8260	Ethylbenzene	0.003	70	0 004	Standard 2 Detection at PQL	None
9	B303-10'	SW8260	Methyl ethyl ketone	0.005	6132	0.012	Lab Artifact	None
10	B303-15'	SW8260	Methyl ethyl ketone	0.005	6132	0.009	Lab Artifact	None
11	B303-20'	SW8260	Methyl ethyl ketone	0.005	6132	0.041	Lab Artifact	None
12	B304-10'	SW8260	Methyl ethyl ketone	0.005	6132	0 008	Lab Artifact	None
13	B304-15'	SW8260	Methyl ethyl ketone	0.005	6132	0 088	Lab Artifact	None

Note: RRS - Risk Reduction Standards
PQL - Practical Quantitation Limit

663 82

Table 3.11
SWMU 26 / Landfill 3
Characterization Issues

Row	Location	Methods	Appix IX List	Purpose
1	B333-0',-5',-10',-15'	SW6010-tr, SW7471, SW8080, SW8260, SW8310	Metals, Mercury, Pests/PCBs, VOCs, PAHs	Fill Characterization Gap
2	B334-0',-5',-10',-15'	SW6010-tr, SW7471, SW8080, SW8260, SW8310	Metals, Mercury, Pests/PCBs, VOCs, PAHs	Fill Characterization Gap

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Table 3.12
SWMU 30 / Landfill 9
Standard 3 Soil Issues

Row	Location	Method(s)	Analyte	RRS-1	RRS-2	GWP MSC	Result	Confirm Result	Confirm II Result	SPLP Result	GW MSC	SS MSC	Note	Delineation	Action	Proposed Delineation Boring(s)
1	NE Landfill "Island"	SW6010, SW8080, SW8270	Metals, Pesticides/PCBs, SVOCs										Need Characterization in "Island" area to NE		New Characterization Boring	B942
2	B911-0'/B928-0'	SW6010	Barium	233	233	200	279 J	49 9 J	69.6 J	none	2		Not confirmed above background	B910S, B921W		
3	B911-0'/B928-0'	SW6010	Cadmium	0.56	0.56	0.5	0.61 F	0 33 F	0.68	0.005 U	0.005	0.68	SS MSC > all detetions; Delineated	B930N, B931E, B932S, B921W		
4	B910-5'/B927-5'	SW6010	Lead	12.66	12.66	1.5	78.7 J	68.4 J	na	0.0627	0.015	78.9	Original result < SS MSC, Confim Result < SS MSC; Failed SPLP	B935N, B932E, B933S, B934W	IRA - Excavation	
5	B911-0'	SW6010	Lead	30.97	30.97	1 5	60.6 J	none	na	none	0.015	78.9	< SS MSC; Delineated	B930N, B931E, B932S, B935W	None	
6	B921-0'/B929-0'	SW6010/SW7421	Lead	30.97	30.97	1.5	31 F	28.5	na	none	0.015	78.9	Original result and confirmation result < SS MSC	B930N, B931E, B910S, B935W	None	
7	B921-10'/B929-10'	SW6010/SW7421	Lead	12.66	12.66	1.5	15.7 F	24.6	na	none	0.015	78.9	Original result and confirmed result < SS MSC; Delineated to W by B935-5'; Bedrock at 6' bgs	B930N, B911E, B910S, B935W-5'	None	
8	B921-5'/B929-5'	SW6010/SW7421	Lead	12.66	12.66	1.5	16 4	154 J	10.2	0.065	0.015	78.9	Original result, confirm 2 result < SS MSC; Confim 1 Result >SS MSC, Failed SPLP	B930N, B911E, B933S, B935W	IRA - Excavation	
9	B921/15'/B929-15'	SW7421	Lead	12.66	12.66	1.5	na	78.9	na	0.015 UJ	0.015	78.9	Passed SPLP; new SS MSC; Delineated to W by B935-5'; Bedrock at 6' bgs	B930N, B911E, B910S, B935W-5'	None	
10	Various	SW6010	Thallium	2 43	2.43	0 2		none	na	none	0.002		Statistically the same as background		None	
11	B910-5'	SW8081	Chlordane	0.01	0.2	0 2	0.81	0.41 J	na	0.0001 UJ	0.002	0.41	New SS MSC; Confirmation result < original result	B921N, B932E, B934W	Delineate to S	B937-5'
12	B936-5'	SW8081	Chlordane	0.009	0.2	0.2	0 3	0.21	na	none	0.002	0.41	Confirmation result<SS MSC	B921N, B932E, B934W	Delineate to S	B937-5'
13	B910-5'/B927-5'	SW8270/SW8310	Benzo(a)anthracene	0.33	0 33	0.039	1 3	0.29 F	na	0 00013 U	0.00039	0.29	Passes SPLP < SS MSC, Delineated	B921N, B932E, B933S, B936W	None	
14	B911-0'/B928-0'	SW8270/SW8310	Benzo(a)anthracene	0.33	0.33	0.039	0.56 J	0 42 J	na	0 00013 U	0.00039	0.42	Passes SPLP, New SS MSC; Delineated	B930N, B931E, B910S, B921W	None	
15	B910-5'/B927-5'	SW8270/SW8310	Benzo(a)pyrene	0.33	0 33	0.02	1 4	0 42 F	na	0 00023 UJ	0 0002	0 42	Passes SPLP, New SS MSC; Delineated	B921N, B932E, B933S, B934W	None	
16	B911-0'/B928-0'	SW8270/SW8310	Benzo(a)pyrene	0 33	0.33	0.02	0.74	0 38 F	na	0 00023 UJ	0.0002	0 42	Passes SPLP < SS MSC; Need Delineation to N	B931E, B932S, B921W	Delineate to N	B941N-0'
17	B930-0'	SW8310	Benzo(a)pyrene	0 02	0.02	0.039	0.043	na	na	none	0.00039	0 42	Original result< SS MSC	B931E, B921S, B935W	Delineate to N	B941N-0'
18	B936-5'	SW8310	Benzo(a)pyrene	0 02	0.02	0.039	0.027 J	0 016 U	na	none	0.00039	0.42	Confirmation result < background and MSC	B921N, B932E, B933S, B934W	None	
19	B910-5'/B927-5'	SW8270/SW8310	Benzo(b)fluoranthene	0 33	0 33	0.039	1.8	0.44 F	na	0.00018 U	0.00039	0.44	Passes SPLP, New SS MSC; Delineated	B921N, B932E, B933S, B936W	None	
20	B911-0'/B928-0'	SW8270/SW8310	Benzo(b)fluoranthene	0.33	0.33	0 039	0.91	0.38 J	na	0.00018 U	0.00039	0.44	Passes SPLP < SS MSC; Need Delineation to N	B931E, B910S, B921W	Delineate to N	B941N-0'
21	B910-5'/B927-5'	SW8270/SW8310	Benzo(k)fluoranthene	0.33	0.39	0.39	1.1	0 26F	na	0 00017 UJ	0.0039	0.26	Passes SPLP, New SS MSC; Delineated	B921N, B932E, B933S, B936W	None	
22	B911-0'/B928-0'	SW8270/SW8310	Benzo(k)fluoranthene	0 33	0.39	0.39	0.6	0 19 F	na	0 00017 UJ	0 0039	0.19	Passes SPLP < SS MSC, Need Delineation to N	B931E, B932S,B921W	Delineate to N	B941N-0'
23	B930-0'	SW8310	Dibenzo(a,h)anthracene	0.02	0.02	0 02	0.023	none	na	none	0.00039	0.023	Std 2 = SS MSC; Need Delineation to N	B911E, B921S, B935W	Delineate to N	B941N-0'
24	B936-5'	SW8310	Dibenzo(a,h)anthracene	0.02	0.02	0 02	0 023 J	0 021 U	na	0 00036 U	0 00039	0.023	Passed SPLP, New SS MSC; Delineated	B921N, B910E, B933S, B934W	None	
25	B910-5'/B927-5'	SW8270/SW8310	Indeno(1,2,3-c,d)pyrene	0 33	0 33	0.039	0 61 J	0 43 F	na	0 00043 UJ	0.00039	0.43	Passes SPLP, New SS MSC; Delineated	B921N, B932E, B933S, B936W	None	
26	B911-0'/B928-0'	SW8270/SW8310	Indeno(1,2,3-c,d)pyrene	0 33	0 33	0 039	0.53 J	0.27 F	na	0.00043 UJ	0.00039	0 43	Passes SPLP < SS MSC; Need Delineation to N	B931E, B932S, B935W	Delineate to N	B941N-0'

Note
na - not analyzed
SPLP - Synthetic Precipitation Leaching Procedure
SS MSC - Site-Specific Medium Specific Concentrations
MSC - Medium Specific Concentration
GWP MSC - Groundwater Protection MSC
GW MSC - Groundwater MSC
Yellow indicates Standard 3 detections above SS MSC
* - SAI MSC

Table 3.13
SWMU 30 / Landfill 9
Standard 2 Issues

Row	Location	Method	Analyte	RRS-1	RRS-2	Result	Confirm Result	Note	Delineation	Action	Delineation Location
1	B921-5'	SW6010	Copper	13.7	130	46.1 J		Delineated	B930N, B911E, B910S, B935W	None	
2	B910-5'	SW6010	Zinc	31.3	3066	47.1		~35% > Background: Need Delineation E, S, & W	B930N	Delineate	B939E-5', B937S-5', B938W-5'
3	B911-0'	SW6010	Zinc	38.8	3066	46.4		Natural Variation of Background		None	
4	B921-5'	SW6010	Zinc	31.3	3066	200		> Background: Need Delineation S and W	B930N, B911E	Delineate	B937S-5', B938W-5'
5	B935-5'	SW6010	Zinc	31.3	3066	48.1		~35% > Background: Need Delineation N & S		Delineate	B940N-5', B937S-5'
6	B910-5'	SW7471	Mercury	0.035	0.2	0 05 J		Delineated	B921N, B932E, B933S, B934 W	None	
7	B910-5'	SW8081	p,p'-DDE	0	0.08	0 038 F		Std 2; Need delineation to S	B921N, B932E, B934W	Delineate	B937S-5'
8	B936-5'	SW8081	p,p'-DDE	0	0.08	0.017 F	0.012 F	Std 2; Need delineation to S	B921N, B932E, B934W	Delineate	B937S-5'
9	B911-15'	SW8270	Methyl ethyl ketone	0.005	6132	0.006		Lab Artifact		None	
10	B910-5'/B927-5'	SW8270	Std 2 PAHs	0.33	3066	0.4 J		Delineated	B921N, B932E, B933S, B936W	None	
11	B911-0/B928-0'	SW8270	Std 2 PAHs	0.33	306.6	0.54	0.24 F	Need Delineation to N	B931E, B932S, B921W	Delineate	B941N-0'
12	B921-0'	SW8270	Fluoranthene	0.33	408.8	0.51		Need Delineation to N	B931E, B933S, B935W	Delineate	B941N-0'
13	B930-0'	SW8310	Std 2 PAHs	0.01	0.04	0.039 F		Need Delineation to N	B911E, B921S, B932S, B935W	Delineate	B941N-0'
14	B936-5'	SW8310	Std 2 PAHs	0.01	0.04	0.021 J	0.012 U	Delineated	B921N, B910E, B933S, B934W	None	

Note RRS - Risk Reduction Standards

Table 3.14
SWMU 62 / Landfill 6
Standard 3 Issues

Row	Location	Method	Analyte	RRS-1	RRS-2	GWP MSC	Result	Confirm Result	SPLP Result	GW MSC	SS MSC	Note	Delineation	Action	Confirm Boring	Proposed Delineation Boring(s)
1	B604-0'	SW6010	Antimony	0 56	0 6	0 6	3 3 F	3 4 UJ	None	0 006		Not confirmed above background, PQL > MSC	B605E, B615S	Confirmation/SPLP Delineate to N and W	B634-0'	B639N-0', B640W-0'
2	B604-0'	SW6010	Beryllium	1 02	1 02	0 4	1 1	0 71 J	None	0 004		Confirmation result below background		None		
3	B604-5'	SW6010	Chromium	16 31	16 31	10	21 3	5 8 F	None	0 1		Original sample run w/ICP-Std, Elevated Conc Due to Matrix Interference,Confirmation result below background		None		
4	B604-10'	SW6010	Chromium	16 31	16 31	10	21 5	12 8 J	None	0 1		Original sample run w/ICP-Std, Elevated Conc Due to Matrix Interference,Confirmation result below background		None		
5	B604-15'	SW6010	Chromium	16 31	16 31	10	18 4	14 2 J	None	0 1		Original sample run w/ICP-Std, Elevated Conc Due to Matrix Interference,Confirmation result below background		None		
6	B605-5'	SW6010	Chromium	16 31	16 31	10	17/4	None	None	0 1		Run w/ICP-Std; Elevated Conc Due to Matrix Interference		None		
7	B615-15'	SW6010	Chromium	16 31	16 31	10	27,2	None	None	0 1		Run w/ICP-Std, Elevated Conc Due to Matrix Interference		None		
8	B604-10'	SW6010	Lead	12 66	12 66	1 5	15 8 F	None	None	0 015	27 5	<SS MSC	B627N, B626S	Delineate to E and W		B640-10', B637-10'
9	B605-10'	SW6010	Lead	12 66	12 66	1.5	25 9 F	27 5 J	0 01	0 015	27 5	SS MSC, Passed SPLP	B626S, B621W, B622N	Delineate to E		B637-10'
10	B615-5'	SW6010	Lead	12 66	12 66	1 5	13 F	13 4 J	0 01	0 015	27 5	<SS MSC	B622N, B626S, B604W	Delineate to E		B636E-5'
11	B615-10'	SW6010	Lead	12 66	12 66	1 5	20 7F	7 2 J	0 01	0 015	27 5	<SS MSC,Confirmation result < background	B622N, B628bE, B626S, B621W	None		
12	B615-15'	SW6010	Lead	12 66	12 66	1 5	14 2 F	8 6 J	None	0 015	27 5	<SS MSC,Confirmation result < background	B622N, B605E, B626S, B621W	None		
13	B604-0'	SW6010	Selenium	0 907	5	5	23 F	None	None	0 05		Run w/ICP-Std, Matrix Interference	B626S, B622N, B619E	None		
14	B604-5'	SW6010	Selenium	0 313	5	5	15 1 F	0 26 UJ	None	0 05		Run w/ICP-Std, Matrix Interference, Not confirmed w/GFAA	B622N, B619E, B626S, B621W	None		
15	B604-10'	SW6010	Selenium	0 313	5	5	16 4 F	0 27 UJ	None	0 05		Run w/ICP-Std, Matrix Interference, Not confirmed w/GFAA	B622N, B619E(bedrock), B626S, B621W	None		
16	B604-15'	SW6010	Selenium	0.313	5	5	15 2 F	0 28 UJ	None	0 05		Run w/ICP-Std, Matrix Interference, Not confirmed w/GFAA	B622N, B619E, B626S, B621W	None		
17	B605-0'	SW6010	Selenium	0 907	5	5	9 6 F	None	None	0 05		Run w/ICP-Std, Matrix Interference induced-false positive	B622N, B619E, B626S, B621W	None		
18	B605-5'	SW6010	Selenium	0 313	5	5	11 5 F	None	None	0 05		Run w/ICP-Std, Matrix Interference induced-false positive	B622N, B619E, B626S, B621W	None		
19	B605-10'	SW6010	Selenium	0 313	5	5	7 9 F	None	None	0 05		Run w/ICP-Std, Matrix Interference induced-false positive	B622N, B619E(bedrock), B626S, B621W	None		
20	B605-15'	SW6010	Selenium	0 313	5	5	8 1 F	None	None	0 05		Run w/ICP-Std, Matrix Interference induced-false positive	B622N, B619E(bedrock), B626S, B621W	None		
21	B615-10'	SW6010	Selenium	0 313	5	5	9 3 F	None	None	0 05		Run w/ICP-Std, Matrix Interference induced-false positive	B622N, B619E(bedrock), B626S, B621W	None		
22	B615-15'	SW6010	Selenium	0 313	5	5	20 F	None	None	0 05		Run w/ICP-Std, Matrix Interference induced-false positive	B622N, B619E(bedrock), B626S, B621W	None		
23	Various	SW6010	Thallium	2 43	2 43	0 2	16 F	None	None	0 002		Statistically the same as background		None		
24	B605-10'	SW8080	Chlordane	0 009	0 2	0 2	2	0 5 J	0 0005 U	0 002	0 5	SS MSC, Passes SPLP	B622N, B619E(bedrock), B626S, B604W	Delineate closer to Landfill		B637E-10'
25	B605-15'	SW8080	Chlordane	0 009	0 2	0 2	1 1	0 055	None	0 002	0 5	<SS MSC	B622N, B619E(bedrock), B626S, B604W	None		B637E-15'
26	B605-10'	SW8080	Dieldrin	0 01	0 01	0 0018	0.055 F,	0 56 UJ	0 00002 U	0 000018		Confirm/SPLP	B622N, B626S, B621W	Confirm/SPLP, Delineate to E	B638-10'	B637E-10'
27	B605-5'/B633-5'	SW8270	Benzo(a)anthracene	0 33	0 33	0 039	0 33 U	12	0 00014 U	0 47	12	SS MSC > highest LF6 detections	B627N, B626S, B604W	Delineate to E as PAHs		B637E-5'
28	B615-5'	SW8270	Benzo(a)anthracene	0 33	0 33	0 039	0 42	0 47 U	0 00013 U	0 47	12	Passed SPLP Confirmation result < SS MSC	B627N, B626S, B604W	Delineate to E as PAHs		B636E-5'
29	B628(B)-5'	SW8310	Benzo(a)anthracene	0 009	0 039	0 039	0 44	None	None	0 47	12	<SS MSC, need delination to N, S, E	B626W	Delineate to N, E, and S as PAHs		B637N-5', B636E-5', B635S-5'
30	B605-5'/B633-5'	SW8270	Benzo(a)pyrene	0 33	0 33	0 02	0 33 U	13	0 00024 U	0 002	13	SS MSC > highest LF6 detections	B627N, B626S, B604W	Delineate to E as PAHs		B637E-5'
31	B615-5'	SW8270	Benzo(a)pyrene	0 33	0 33	0 02	0 38	0 79 U	0 00022 UJ	0 002	13	Not confirmed, detection limit >MSC	B627N, B626S, B604W	Delineate to E as PAHs		B636E-5'
32	B628(B)-5'	SW8310	Benzo(a)pyrene	0 015	0 02	0 02	0 62	None	None	0 002	13	<SS MSC, need delination to N, S, E	B626W	Delineate to N, E, and S as PAHs		B637N-5', B636E-5', B635S-5'
33	B605-5'/B633-5'	SW8270	Benzo(b)fluoranthene	0 33	0 33	0 039	0 4	14	0 00019 U	0 00039	14	SS MSC > highest LF6 detections	B627N, B626S, B604W	Delineate to E as PAHs		B637E-5'
34	B615-5'	SW8270	Benzo(b)fluoranthene	0 33	0 33	0 039	0 57	0 63 U	None	0 00039	14	Original result < SS MSC, Not confirmed - detection limit >MSC	B627N, B626S, B604W	Delineate to E as PAHs		B636E-5'
35	B628(B)-5'	SW8310	Benzo(b)fluoranthene	0 012	0 039	0 039	0 54 F	None	None	0 00039	14	<SS MSC, need delination to N, S, E	B626W	Delineate to N, E, and S as PAHs		B637N-5', B636E-5', B635S-5'
36	B605-5'/B633-5'	SW8270/SW8310	Benzo(k)fluoranthene	0 33	0 33	0 39	0 33 U	5 7	0 00018 U	0 0039	5 7	SS MSC > highest LF6 detections	B627N, B626S, B604W	Delineate to E as PAHs		B637E-5'
37	B628(B)-5'	SW8310	Benzo(k)fluoranthene	0 011	0 39	0 39	0 28	None	None	0 0039	5 7	<SS MSC, need delination to N, S, E	B626W	Delineate to N, E, and S as PAHs		B637N-5', B636E-5', B635S-5'
38	B604-15'	SW8270	bis(2-Ethylhexyl) phthalate	0 33	0 6	0 6	0.61	None	None	0 006		Lab Artifact		None		
39	B605-15'	SW8270	bis(2-Ethylhexyl) phthalate	0 33	0 6	0 6	1.1	None	None	0 006		Believed to be Lab artifact but need confirmation/SPLP		Confirmation/SPLP	B638-15'	Delineate if confirmed
40	B605-5'/B633-5'	SW8270/SW8310	Chrysene	0 33	0 33	3 9	0 33 U	11	0 0016 U	0 039	11	SS MSC > highest LF6 detections	B627N, B626S, B604W	Delineate to E as PAHs		B637E-5'
41	B628(B)-5'	SW8310	Chrysene	0 33	3 9	3 9	0 93 F	None	None	0 039	11	<SS MSC, need delination to N, S, E	B626W	Delineate to N, E, and S as PAHs		B637N-5', B636E-5', B635S-5'
42	B605-5'/B633-5'	SW8270/SW8310	Dibenzo(a,h)anthracene	0 33	0 33	0 02	0 33 U	3 2	0 00031 U	0 0002	3 2	SS MSC > highest LF6 detections	B627N, B626S, B604W	Delineate to E as PAHs		B637E-5'
43	B628(B)-5'	SW8310	Dibenzo(a,h)anthracene	0 02	0 02	0 02	0 22 U	None	None	0 0002	3 2	Not Detected	B626W	Delineate to N, E, and S with other PAHs		B637N-5', B636E-5', B635S-5'
44	B605-5'/B633-5'	SW8270/SW8310	Indeno(1,2,3-c,d)pyrene	0 33	0 33	0 039	0 33 U	11	0 00045 U	0 00039	11	SS MSC > highest LF6 detections	B627N, B626S, B604W	Delineate to E as PAHs		B637E-5'
45	B615-5'	SW8270	Indeno(1,2,3-c,d)pyrene	0 33	0 33	0 039	0 37	1 6 U	0 00042 UJ	0 00039	11	Not confirmed, detection limit >MSC	B627N, B626S, B604W	Delineate to E as PAHs		B636E-5'
46	B628(B)-5'	SW8310	Indeno(1,2,3-c,d)pyrene	0 03	0 039	0 039	0 43	None	None	0 00039	11	<SS MSC, need delination to N, S, E	B626W	Delineate to N, E, and S as PAHs		B637N-5', B636E-5', B635S-5'

Note na - not analyzed
RRS - Risk Reduction Standards
SPLP - Synthetic Precipitation Leaching Procedure
SS MSC - Site-Specific Medium Specific Concentrations
MSC - Medium Specific Concentration
GWP MSC - Groundwater Protection MSC
GW MSC - Groundwater MSC
Yellow indicates Standard 3 detections above SS MSC
* - SAI MSC

Table 3.15
SWMU 62 / Landfill 6
Standard 2 Issues

Row	Location	Method	Analyte	RRS-1	RRS-2	Result	Note	Action	Delineation Location
1	B615-15'	SW6010	Barium	128.1	200	143	Delineated to W(B604), E(B605) and S(B626)	Delineate to N	Obtain result from B627-15'
2	B604-0'	SW6010	Nickel	14.6	204.4	20.5	Delineated to S(B626), E(B605)	Delineate to N, W	B639N-0', B640W-0'
3	B615-5'	SW6010	Selinium	0.313	5	5 F	Run w/ICP-Std;False positive; delineated to N(B622), E(B605), S(B626), W(B621)	None	
4	B604-0'	SW6010	Vandium	46.3	71.54	54.2	Delineated E(B605), S(B626)	Delineate to W, N	B639N-0', B640W-0'
5	B604-5'	SW6010	Vandium	37.4	71.54	39.3	Natural Variation of Background	None	
6	B604-10'	SW6010	Vandium	37.4	71.54	37.5	Natural Variation of Background	None	
7	B615-15'	SW6010	Vandium	37.4	71.54	47.5	Delineated to W(B604), E(B605) and S(B626)	Delineate to N	Obtain result from B627-15'
8	B604-10'	SW6010	Zinc	31.3	3066	40.8	Natural variation of background. Delineated to N(B627), S(B626)	None	
9	B605-10'	SW6010	Zinc	31.3	3066	42.6	Natural variation of background Delineated to N(B627) S(B626)	None	
10	B605-15'	SW6010	Zinc	31.3	3066	61.4	Delineated to N(B627), S(B626), W(604)	Delineate to E	B637-15'
11	B615-15'	SW6010	Zinc	31.3	3066	39.4	Natural variation of background. Delineated to S(B626), W(604)	None	
12	B628(B)-10'	SW6010	Zinc	31.3	3066	119	Delineated W(B626)	Delineate N, E, S	B637N-10', B636E-10', B635S-10'
13	B605-5'	SW8080	p,p,'-DDE(4,4'-DDE)	0.003	0.084	0.0031 F	Estimated detection at MQL; Delineated to W(B604), S(B626)	None	
14	B626-0'	SW8080	DDT	0.0033	0.084	0.0051	Delineated S(B629), W(B630), N(B615), E(B628b)	None	
15	B615-10'	SW8260	Acetone	0 005	1022	0.11 J	Laboratoy artifact	None	
16	B615-15'	SW8260	Acetone	0.005	1022	0.17	Laboratoy artifact	None	
17	B605-5'	SW8260	Methyl Ethyl Ketone	0.005	6132	0.01	Laboratoy artifact	None	
18	B605-10'	SW8260	Methyl Ethyl Ketone	0.005	6132	0.007	Laboratoy artifact	None	
19	B605-15'	SW8260	Methyl Ethyl Ketone	0.005	6132	0.024	Laboratoy artifact	None	
20	B615-10'	SW8260	Methyl Ethyl Ketone	0.005	6132	0.016 J	Laboratoy artifact	None	
21	B615-15'	SW8260	Methyl Ethyl Ketone	0.005	6132	0.026	Laboratoy artifact	None	
22	B633-5'	SW8270	Std 2 PAHs	0.33	3066	1.6	Delineated to S(B626), W(B604), N(B627)	Delineate to E	B637E-5'
23	B615-5'	SW8270	Std 2 PAHs	0.33	3.92	0.43	Delineated to S(B626), W(B604, B630), N(B627)	Delineate to E	B636E-5'
24	B604-0'	SW8270	Flouranthene	0.33	408.8	0.35 F	Estimated detection at MQL; Isolated PAH; no pattern of release	None	
25	B605-5'	SW8270	Std 2 PAHs	0.33	408.8	0.73	Delineated to S(B626), W(B604), N(B627)	Delineate to E	B637E-5'
26	B628(B)-5'	SW8310	Std 2 PAHs	0.05	310	0.36F	Delineated to W(B630)	Delineate to N, E, W	B637N-5', B636E-5', B635S-5'
27	B615-10'	SW9030	Sulfide	21.2	NV	57.3S	No pattern of release; possible natural source(s), No MSC	None	
28	B615-15'	SW9030	Sulfide	21.2	NV	64 S	No pattern of release; possible natural source(s); No MSC	None	

Note RRS - Risk Reduction Standards
NV - No Value

TAB

SECTION 4.0

4.0 REFERENCES

A. T. Kearney, 1989, RCRA Facility Assessment, Preliminary Review/Visual Site Inspection.

HydroGeoLogic, Inc., 1998a, Final Work Plans, RCRA Facility Investigation of Landfills, NAS Fort Worth JRB, Texas.

HydroGeoLogic, Inc., 1998b, Final Basewide Quality Assurance Project Plan, NAS Fort Worth JRB, Texas.

HydroGeoLogic, Inc., 1998c, Draft Technical Memorandum Initial Soil Sampling Results Proposed Additional Sampling SWMU 17, 26, 27, 29, 30, and 62 RCRA Facility Investigation NAS Fort Worth JRB, Texas.

HydroGeoLogic, Inc., 1999, Revised Final Work Plans RCRA Facility Investigation of Waste Accumulation Areas NAS Fort Worth JRB, Texas.

HydroGeoLogic, Inc., 2000a, Final Phase III RCRA Facility Investigation Work Plan SWMU 17, 26, 28, 30, and 62 NAS Fort Worth JRB, Texas.

HydroGeoLogic, Inc., 2000b, Final 2000 Basewide Quality Assurance Project Plan, NAS Fort Worth JRB, Texas.

HydroGeoLogic, Inc., 2000c, Draft RCRA Facility Investigation Solid Waste Management 22, 23, 24, and 25 NAS Fort Worth JRB, TEXAS, Volume II of II.

IT Corporation, 1998, Draft Naval Air Station Fort Worth OWS RCRA Facilities Investigation Addendum Report.

Jacobs Engineering Group, 1998, Basewide Background Study, Volume 1.

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