APPENDIX A

FIELD WORK VARIANCE FORMS

IT Corporation
4005 Port Chicago Highway
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A Member of The IT Group

December 27, 2001

DCN: ACE13-024-H

Mr. Fred J. Strickland, Contracting Officer CT-B
U.S. Army Corps of Engineers, Sacramento District
1325 "J" Street, TERC Unit 9th Floor
Sacramento, California 95814

Subject: **Sacramento TERC II – Contract No. DACW05-96-D-0011**
Contract Task Order No. 13, WAD 3
Hamilton Army Airfield, Novato, CA
Field Work Variance 831471-001

Dear Mr. Strickland:

Enclosed is Field Work Variance (FWV) 831471-001 for the additional work along the Perimeter Drainage Ditch (PDD) requested by Ed Keller at HAAF. The work consists of the removal of soil along both sides of the PDD to the top of the concrete liner within the area of the 300-foot future channel cut. A total of four soil samples will be collected through the concrete liner. We have coordinated the sample analyte list with Mr. Keller. Should you have any questions regarding this FWV, please contact me at (925) 288-2253.

Sincerely,

Nora M. Okusu
Senior Project Manager

Enclosure

cc:

IT Corp.	USACE	HAAF
V. Taylor	R. Zimny	E. Keller (2 copies)
S. Elkind	C. Fong	
D. Bushnell		
M. Reed		
TERC II Files		

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Field Work Variance No. 831471-001

Page 1 of 2

FIELD WORK VARIANCE

Project Name/Number	Hamilton Army Airfield / 831471	CTO/WADs	13 / 2, 3, 4, 5 & 6
Applicable Document	Work Plan for Bldg. 41 Demolition, Spoils Pile F Removal, and Revetments 6 & 7 Removal, Rev. 1 (Dec 2001)	Date	27 Dec. 01

Problem Description: The Work Plan, Section 3.2.3, *Site Preparation and Soil Excavation West of Building 41*, indicates that the concrete-lined ditch immediately adjacent to Building 41 and approximately 30 ft north will be demolished to allow for an L-shaped excavation of approximate dimension: 750 ft^2 x 9 ft. Confirmation samples were to be collected from the excavation. In addition to the current Plan, HAAF management has requested that additional volume be excavated followed by additional confirmation sampling as described on Page 2 of 2, Recommended Solution (continued).

Recommended solution:
See Page 2 of 2, Recommended Solution (continued).

Impact on present and completed work: Additional cost and extension of schedule as described in WVN-001.

Requested by: Nora Okusu, Project Manager

Recommended solution/disposition: *Concur with recommended solution.*

Clarification ☐ Minor Change ☒ Major Change ☐

Signature [signature] Date 12/27/01
Technical Reviewer

IT Corporation Approvals: *If Major Change:*

Signature _____ Date _____ Signature [signature] Date 12/27/01
Project/Task Manager *Sr. Project Manager*

Signature [signature] Date 12-27-01
Project CQCSM

USACE Approval: *If Major Change:*

Approved ☐ Rejected ☐ Signature _____ Date _____
USACE PM or COR

UDEQ Approval: *If Major Change:*

Approved ☐ Rejected ☐ Signature _____ Date _____
Agency Representative

Final Description TEMPORARY DAMS WERE CONSTRUCTED, THE DITCH SECTION WAS DEWATERED, AND SAMPLES WERE COLLECTED IN ACCORDANCE WITH THE FWV ON 10 JAN 2002.

Signature [signature] Date 1-21-02

FIELD WORK VARIANCE CONTINUATION SHEET

Continue FWV discussions below by noting section title(s) to be continued (i.e., Problem Description, Solution/disposition, Final Disposition, etc). Use additional continuation sheets as needed.

Recommended Solution (continued):

Place dams north and south of the future channel cut and pump down the contents of the Perimeter Drainage Ditch (PDD) between the two dams as much as possible. Also bypass the dams by pumping the contents of the PDD from before the southern dam beyond the northern dam.

In addition to removing 100 LF of concrete liner and soil as per the SOW for the project, excavate the top 3 feet of soil (to the top of the concrete liner) along the entire 300-ft length of the future channel cut at a width of 9 ft. The volume of soil to be excavated is estimated at 600 yd^3. The purpose of this work is to remove soil that could have been contaminated by overflows in the PDD.

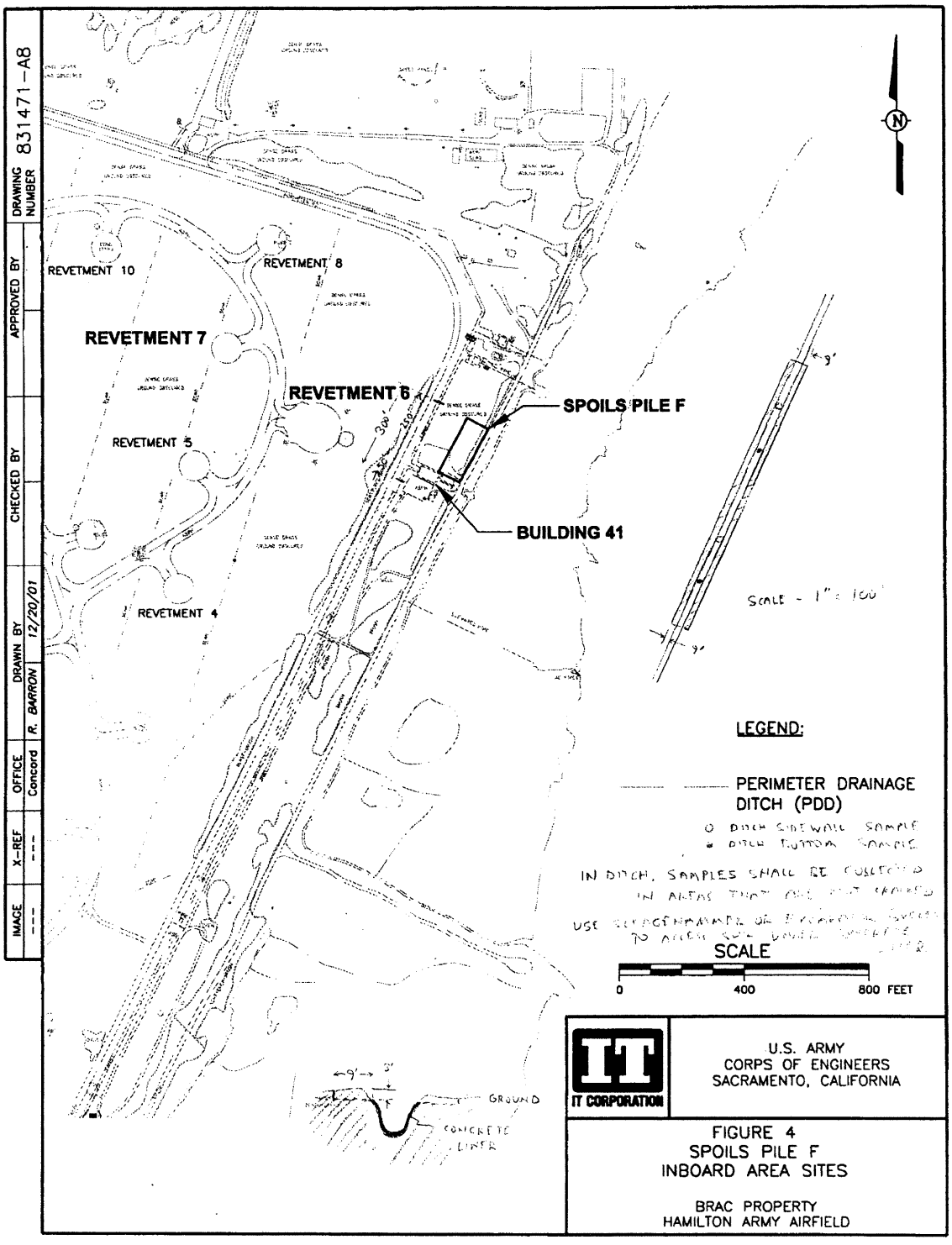
Collect four soil samples at the locations marked on the attached Figure. Two samples shall be collected through the center of the ditch floor (at a depth of 0 – 6 in below the concrete liner). The two remaining soil samples shall be collected halfway up the ditch sidewall (0 – 6 in below the level of the concrete liner). All four samples shall be collected from areas of the concrete liner that have been previously undamaged. Break through the concrete liner using a sledge hammer or excavator bucket in order to collect the samples. Repairing the liner after sample collection is not required. Analyze the samples for the analytes listed on the attached table titled *Perimeter Drainage Ditch Samples*, and the proposed Planned Sample Table.

Stage the excavated soil on a revetment for waste profile sample collection and analysis as described in the Field Sampling Plan. Waste profile samples will be analyzed for the constituents listed above, plus VOCs, PCBs, and RCI.

The soil will be disposed at an approved off-site landfill per the results of the waste profile samples.

Attachments:

- Figure: Proposed excavation area and confirmation sampling locations
- Table: *Perimeter Drainage Ditch Samples*
- Planned Sample Table for Perimeter Drainage Ditch Characterization



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U.S. ARMY
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

FIGURE 4
SPOILS PILE F
INBOARD AREA SITES

BRAC PROPERTY
HAMILTON ARMY AIRFIELD

TARGET ANALYTE LIST
PERIMETER DRAINAGE DITCH SAMPLES

~~Appendix C~~

TABLE C-1
Chemical-Specific To-Be-Considered (TBC) Criteria for Soil

Contaminants	Chemical-Specific TBCs		
	Inboard Sites (mg/kg)	Upland Sites (mg/kg)	Applicable Target Concentrations (mg/kg)
Metals			
Arsenic	16.7	15.3	N/A
Barium	190	217	N/A
Beryllium	1	0.72	N/A
Boron	36.9	3.6	N/A
Cadmium	1.2	N/A	N/A
Chromium	112	112	N/A
Cobalt	27.6	14.4	N/A
Copper	68.1	68.1	N/A
Lead	43.2	43.2	N/A
Manganese	943	943	N/A
Total Mercury	0.43	0.43	N/A
Nickel	113	112	N/A
Silver	1	1	N/A
Vanadium	118	38.9	N/A
Zinc	158	158	N/A
Pesticides			
Total Chlordanes	0.0023	0.0023	N/A
Total DDTs	0.007	0.007	N/A
Dieldrin	0.00072	0.00072	N/A
Endrin Aldehyde	N/A	N/A	0.0215
Endosulfan Sulfate	N/A	N/A	0.00286
Semivolatile Organic Compounds			
Dibenzofuran	N/A	N/A	0.11
Petroleum Hydrocarbons			
Diesel/Motor Oil	144	144	N/A
~~Gasoline/JP-4~~	~~12~~	~~12~~	~~N/A~~
~~**Volatile Organic Compounds**~~			
~~Xylenes~~	~~N/A~~	~~N/A~~	~~0.04~~

TABLE C-1
Chemical-Specific To-Be-Considered (TBC) Criteria for Soil

Contaminants	Chemical-Specific TBCs		
	Inboard Sites (mg/kg)	Upland Sites (mg/kg)	Applicable Target Concentrations (mg/kg)
Polynuclear Aromatic Hydrocarbons			
Total PAHs	4.02	4.02	N/A
2-Methylnaphthalene	0.0194	0.0194	N/A
Acenaphthene	0.026	0.026	N/A
Anthracene	0.088	0.088	N/A
Benz(a)anthracene	0.412	0.412	N/A
Benzo(a)pyrene	0.430	0.430	N/A
Benzo(b)fluoranthene	0.371	0.371	N/A
Benzo(g,h,i)perylene	0.310	0.310	N/A
Chrysene	0.384	0.384	N/A
Dibenz(a,h)anthracene	0.0634	0.0634	N/A
Fluoranthene	0.600	0.600	N/A
Fluorene	0.0253	0.0253	N/A
Indeno(1,2,3-cd)pyrene	0.382	0.382	N/A
Naphthalene	0.160	0.160	N/A
Phenanthrene	0.240	0.240	N/A
Pyrene	0.665	0.665	N/A

mg/kg Milligrams per kilogram
N/A Not applicable
DDT Dichlorodiphenyltrichloroethane
JP Polynuclear aromatic hydrocarbons
TBC To-be-considered

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Planned Sample Table
Perimeter Drainage Ditch Characterization
Field Work Variance 831471-001

Area: HAAF Remedial Action Areas

Sample Location	Sample Index No.	Sample Matrix	Sample Type	Depth (in bgs)	Schedule	SVOCs-8270C*	TPH-diesel / motor oil - 8015	PAHs - 8310*	Metals - 6010B/7470A/7471A	Pesticides - 8081A*	PCB - 8082	Total Containers	Laboratory	Comments	Turnaround Calendar Days
					Soil Preservative	Ice 2-6C	Ice 2-6C	Ice 2-6C	Ice 2-6C	Ice 2-6C	Ice 2-6C				
					Liquid Preservative	None	None	None	HNO_3	None	None				
					Non-Aqueou	2x8oz Jar or 2 Sleeves									
					Aqueous	2x1L A	2x1L A	2x1L A	1x0.5L P	2x1L A	2x1L A				
HBPDL601		SO	NS	0-6		X	X	X	X	X	X	2	APCL	PDD bottom	3
HBPDL601		SO	FD	0-6		X	X	X	X	X	X	2	APCL	PDD bottom	3
HBPDL601		SO	QA	0-6		X	X	X	X	X	X	2	TBD	PDD bottom	3
HBPDL602		SO	NS	0-6		2X	2X	2X	2X	2X	2X	4	APCL	PDD bottom (MS/MSD)	3
HBPDL603		SO	NS	0-6		X	X	X	X	X	X	2	APCL	PDD sidewall	3
HBPDL604		SO	NS	0-6		X	X	X	X	X	X	2	APCL	PDD sidewall	3
EB1		WH	NA			X	X	X	X	X	X	11	APCL	Equipment Rinsate	3
					Total Analyses	7	7	7	7	7	7				

* Only selected analytes to be reported for these analyses. Selected analytes are shown on the attached Table.

EB - Equipment Rinsate

Matrix: SO - Soil; WH - equipment wash water

Sample Type: NS - normal sample; FD - field duplicate; R - rinse blank

A - Amber Glass; P - Polyethylene

IT Corporation
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Concord, CA 94520-1120
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A Member of The IT Group

January 2, 2002

DCN: ACE13-028-H

Mr. Fred J. Strickland, Contracting Officer CT-B
U.S. Army Corps of Engineers, Sacramento District
1325 "J" Street, TERC Unit 9th Floor
Sacramento, California 95814

Subject: **Sacramento TERC II – Contract No. DACW05-96-D-0011**
Contract Task Order No. 13, WAD 4
Hamilton Army Airfield, Novato, CA
Revised Field Work Variance 831471-002

Dear Mr. Strickland:

Enclosed is revised Field Work Variance (FWV) 831471-002 for the expansion of the Spoils Pile F excavation area and the collection of characterization soil samples around Spoils Pile F. The only change from the original version of the FWV is a change to the excavation area in Figure 2. Should you have any questions regarding this FWV, please contact me at (925) 288-2253.

Sincerely,

Nora M. Okusu
Senior Project Manager

Enclosure

cc:

IT Corp.	USACE	HAAF
V. Taylor	R. Zimny	E. Keller (2 copies)
S. Elkind	C. Fong	
D. Bushnell		
M. Reed		
TERC II Files		

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Field Work Variance No. 831471-002

Page 1 of 2

FIELD WORK VARIANCE

Project Name/Number	Hamilton Army Airfield / 831471	CTO/WADs	13 / 4
Applicable Document	Work Plan for Bldg. 41 Demolition, Spoils Pile F Removal, and Revetments 6 & 7 Removal, Rev. 1 (Dec 2001)	Date	26 Dec. 01

Problem Description: The Work Plan and Field Sampling Plan indicate that Spoils Pile F will be excavated to a depth of one foot and confirmation samples will be collected to verify that the soil that contains contaminants above the comparator values has been removed. The HAAF BEC has requested that characterization samples be collected around the presumed location of Spoils Pile F. These sample results will be used to demonstrate that following the removal of Spoils Pile F, the remaining area between Buildings 39 and 41 does not contain contaminants in exceedance of the comparator values. In addition, the area to be excavated (Spoils Pile F) will be increased to include the mounded areas northwest of Building 41.

Recommended solution:
See Page 2 of 2, Recommended Solution (continued).

Impact on present and completed work: Additional cost as described in WVN-002.

Requested by: Nora Okusu, Project Manager

Recommended solution/disposition: *Concur with recommended solution.*

Clarification ☐ Minor Change ☐ Major Change ☒

Signature Victoria Taylor Date 12-26-01
Technical Reviewer

IT Corporation Approvals: *If Major Change:*

Signature _____ Date _____
Project/Task Manager

Signature _____ Date 12-26-01
Project CQCSM 1-2-01

Signature _____ Date 12/26/01
Sr. Project Manager

FIGURE 2 HAS BEEN UPDATED.
1/2/02

USACE Approval: *If Major Change:*

Approved ☐ Rejected ☐ Signature _____ Date _____
USACE PM or COR

UDEQ Approval: *If Major Change:*

Approved ☐ Rejected ☐ Signature _____ Date _____
Agency Representative

Final Description

Signature _____ Date _____

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Field Work Variance No. 831471-002

Page 1 of 2

FIELD WORK VARIANCE

Project Name/Number	Hamilton Army Airfield / 831471	CTO/WADs	13 / 4
Applicable Document	Work Plan for Bldg. 41 Demolition, Spoils Pile F Removal, and Revetments 6 & 7 Removal, Rev. 1 (Dec 2001)	Date	26 Dec. 01

Problem Description: The Work Plan and Field Sampling Plan indicate that Spoils Pile F will be excavated to a depth of one foot and confirmation samples will be collected to verify that the soil that contains contaminants above the comparator values has been removed. The HAAF BEC has requested that characterization samples be collected around the presumed location of Spoils Pile F. These sample results will be used to demonstrate that following the removal of Spoils Pile F, the remaining area between Buildings 39 and 41 does not contain contaminants in exceedance of the comparator values. In addition, the area to be excavated (Spoils Pile F) will be increased to include the mounded areas northwest of Building 41.

Recommended solution:

See Page 2 of 2, Recommended Solution (continued).

Impact on present and completed work: Additional cost as described in WVN-002.

Requested by: Nora Okusu, Project Manager

Recommended solution/disposition: *Concur with recommended solution.*

Clarification ☐ Minor Change ☒ Major Change ☒ MR

Signature Victoria Taylor Date 12-26-01
Technical Reviewer

IT Corporation Approvals: *If Major Change:*

Signature _____ Date _____
Project/Task Manager

Signature _____ Date 12-26-01
Project CQCSM

Signature _____ Date 12/26/01
Sr. Project Manager

USACE Approval: *If Major Change:*

Approved ☐ Rejected ☐ Signature _____ Date _____
USACE PM or COR

UDEQ Approval: *If Major Change:*

Approved ☐ Rejected ☐ Signature _____ Date _____
Agency Representative

Final Description SAMPLES COLLECTED IN ACCORDANCE WITH FWV ON 12-27-01.

Signature _____ Date 12-27-01

FIELD WORK VARIANCE CONTINUATION SHEET

Continue FWV discussions below by noting section title(s) to be continued (i.e., Problem Description, Solution/disposition, Final Disposition, etc). Use additional continuation sheets as needed.

Recommended Solution (continued):

According to historical information, Spoils Pile F was located northwest of Building 41. Two mounded areas still exist in this area, as shown in the attached Figure 2. In accordance with the Work Plan and Field Sampling Plan, the former location of Spoils Pile F, which includes these two mounded areas, will be excavated. The updated excavation area is shown as the dark outline in Figure 2. This change to the Work Plan increases the volume of soil to be excavated from 14,000 ft^3 to 19,000 ft^3.

Additional data collection has been requested by the HAAF BEC to support the argument that the correct location of Spoils Pile F has been excavated. The area between Building 41 and Building 39 to the north has been gridded with a 50x50 ft. grid (Figure 2). The area that will be excavated (dark outline on Figure 2) and those areas that have been previously excavated and backfilled (shaded areas on Figure 2) will not be sampled as part of this effort. Characterization samples will be collected at the sites marked with open circles on Figure 2, for a total of seven sample locations.

The characterization samples will be collected with a drive sampler from a depth of 12 to 18 inches below ground surface. The samples will be analyzed for the Spoils Pile F analyte list (provided on the attached table) plus PCBs, mercury, and TPH-d. The comparator values for total PCBs, mercury, and TPH-d are 0.36 mg/kg, 0.43 mg/kg, and 144 mg/kg, respectively.

Following the excavation of Spoils Pile F to a depth of one foot, confirmation samples will be collected at the locations marked on Figure 2. These samples will be analyzed only for the Spoils Pile F list of COCs.

Stage the excavated soil on a revetment for waste profile sample collection and analysis as described in the Field Sampling Plan. Waste profile samples will be analyzed for the constituents listed above, plus VOCs, PCBs, and RCI.

The soil will be disposed at an approved off-site landfill per the results of the waste profile samples.

Attachments:

- Figure 2– Revised excavation area, characterization sample locations, and confirmation sample locations
- Table 2-15—List of comparator values for Spoils Pile F
- Planned Sample Table

TABLE 2-15
Comparator Values – Perimeter Drainage Ditch Spoils Pile F

Chemical of Concern	COC Basis	Comparator Values (mg/kg)
Arsenic	1	16.7
Beryllium	1	1
Cadmium	1	1.2
Cobalt	1	27.6
Lead	1	43.2
Manganese	1	943
Nickel	1	113
Zinc	1	158
Acenaphthene	1	0.026
Anthracene	1	0.088
Benz(a)anthracene	1,2	0.412
Benzo(a)pyrene	1,2	0.43
Benzo(b)fluoranthene	1,2	0.371
Benzo(g,h,i)perylene	1	0.31
Chrysene	1	0.384
Dibenzofuran	1	0.11
Fluoranthene	1	0.6
Fluorene	1	0.0253
Indeno(1,2,3-cd)pyrene	1	0.16
Phenanthrene	1	0.24
Pyrene	1	0.665
DDD	1	0.007[a]
DDE	1	0.007[a]
DDT	1	0.007[a]

[a] Based on total DDTs

COC Basis
1 - Potential ecological hazard
2 - Potential human health risk/hazard

COC = chemical of concern
DDD = dichlorodiphenyldichloroethane
DDE = dichlorodiphenyldichloroethylene
DDT = dichlorodiphenyltrichloroethane
mg/kg = milligrams per kilogram

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Planned Sample Table
Spoils Pile F Characterization

Area: HAAF Remedial Action Areas

Sample Location	Sample Index No.	Sample Matrix	Sample Type	Depth (in bgs)	Schedule	SVOCs-8270C*	PAHs - 8310*	TPH-diesel - 8015B	Metals - 6010B/7470A/7471A	Pesticides - 8081A*	PCB - 8082	Total Containers	Laboratory	Comments	Turnaround Calendar Days
					Soil Preservative	Ice 2-6C	Ice 2-6C	Ice 2-6C	Ice 2-6C	Ice 2-6C	Ice 2-6C				
					Liquid Preservative	None	None	None	HNO_3	None	None				
					Non-Aqueou	2x8oz Jar or 2 Sleeves									
					Aqueous	2x1L A	2x1L A	2x1L A	1x0.5L P	2x1L A	2x1L A				
HBSFL602		SO	NS	12-18		X	X	X	X	X	X	2	APCL	Spoils Pile	3
HBSFL602		SO	FD	12-18		X	X	X	X	X	X	2	APCL	Spoils Pile	3
HBSFL603		SO	NS	12-18		2X	2X	2X	2X	2X	2X	4	APCL	Spoils Pile (MS/MSD)	3
HBSFL604		SO	NS	12-18		X	X	X	X	X	X	2	APCL	Spoils Pile	3
HBSFL605		SO	NS	12-18		X	X	X	X	X	X	2	APCL	Spoils Pile	3
HBSFL606		SO	NS	12-18		X	X	X	X	X	X	2	APCL	Spoils Pile	3
HBSFL607		SO	NS	12-18		X	X	X	X	X	X	2	APCL	Spoils Pile	3
HBSFL608		SO	NS	12-18		X	X	X	X	X	X	2	APCL	Spoils Pile	3
EB1		WH	NA			X	X	X	X	X	X	11	APCL	Equipment Rinsate	3
					Total Analyses	9	9	9	9	9	9				

* Only selected analytes to be reported for these analyses. Selected analytes are shown on the attached Table.

EB - Equipment Rinsate

Matrix: SO - Soil; WH - equipment wash water

Sample Type: NS - normal sample; FD - field duplicate; R - rinse blank

A - Amber Glass; P - Polyethylene

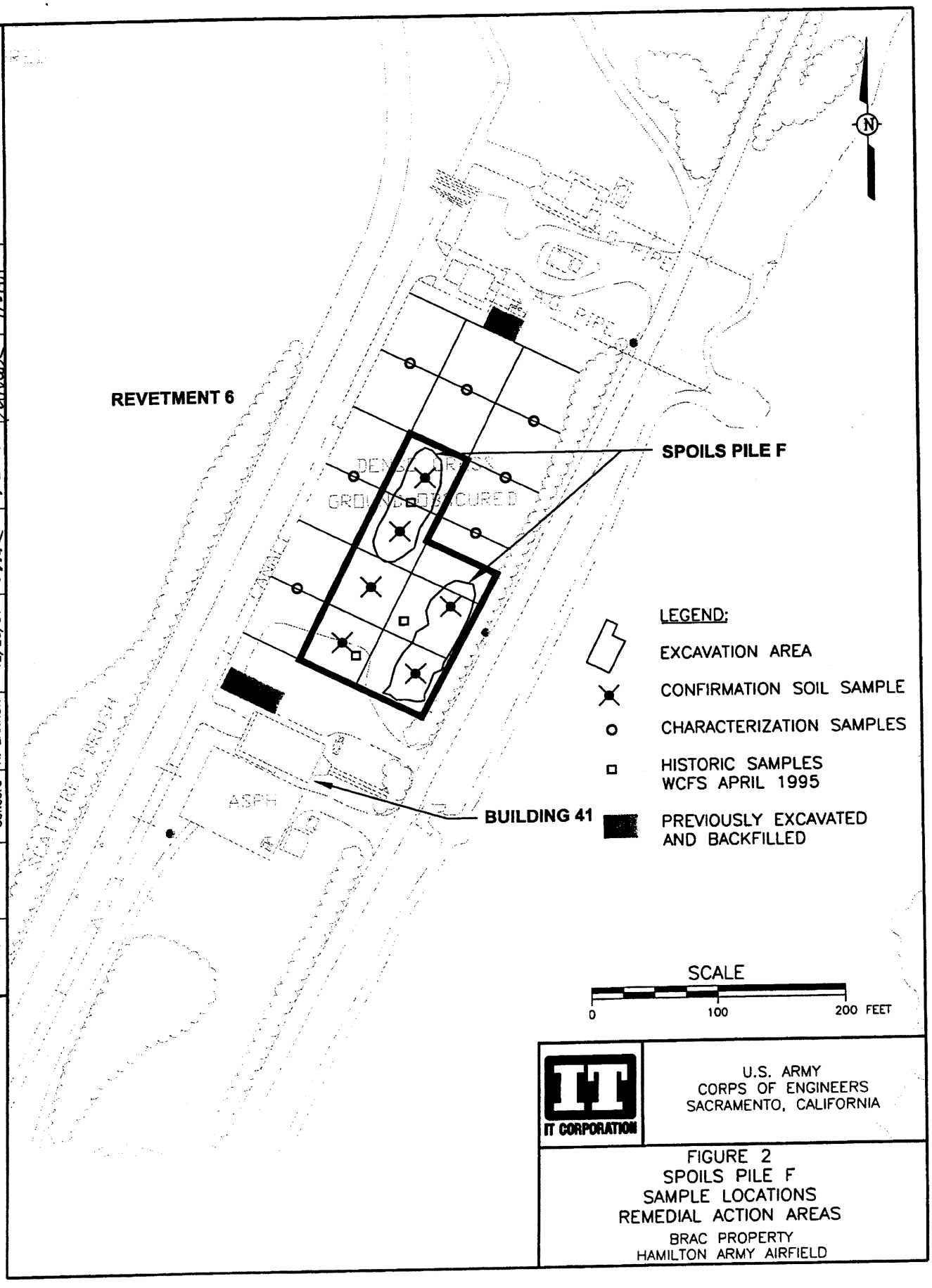

IMAGE	X-REF	OFFICE	DRAWN BY		CHECKED BY		APPROVED BY		DRAWING NUMBER
---	---	Concord	R. BARRON	12/20/01	MR	1-2-01		1/2/01	831471-A10

IT CORPORATION

U.S. ARMY
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

FIGURE 2
SPOILS PILE F
SAMPLE LOCATIONS
REMEDIAL ACTION AREAS

BRAC PROPERTY
HAMILTON ARMY AIRFIELD

IT Corporation
4005 Port Chicago Highway
Concord, CA 94520-1120
Tel. 925.288.9898
Fax. 925.288.0888

A Member of The IT Group

January 3, 2002

DCN: ACE13-029-H

Mr. Fred J. Strickland, Contracting Officer CT-B
U.S. Army Corps of Engineers, Sacramento District
1325 "J" Street, TERC Unit 9th Floor
Sacramento, California 95814

Subject: **Sacramento TERC II – Contract No. DACW05-96-D-0011**
Contract Task Order No. 13, WAD 3
Hamilton Army Airfield, Novato, CA
Field Work Variance 831471-003

Dear Mr. Strickland:

Enclosed is Field Work Variance (FWV) 831471-003 for the collection of additional subsurface soil samples under and immediately north of Building 41. Should you have any questions regarding this FWV, please contact me at (925) 288-2253.

Sincerely,

Nora M. Okusu
Senior Project Manager

Enclosure

cc:

IT Corp.	USACE	HAAF
V. Taylor	R. Zimny	E. Keller (2 copies)
S. Elkind	C. Fong	
D. Bushnell		
M. Reed		
TERC II Files		

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Field Work Variance No. 831471-003

Page 1 of 2

FIELD WORK VARIANCE

Project Name/Number	Hamilton Army Airfield / 831471	CTO/WADs	13 / 3
Applicable Document	Sampling and Analysis Plan for Bldg. 41 Demolition, Spoils Pile F Removal, and Revetments 6 & 7 Removal, Rev. 1 (Dec 2001)	Date	2 Jan. 02

Problem Description: The Work Plan and Field Sampling Plan indicate that five confirmation soil samples are proposed at the limits of a 15' by 10' by 9' deep excavation in the vicinity of the center of the Building 41 "wet well" footprint (Figure 1, FSP). The location of the proposed excavation area was based on the results of a slant boring drilled in 1998, but was not surveyed at the time. The location of the slant boring was confirmed by IT during recent intrusive work, and it appears that the soil sample collected from the 1998 slant boring was under the shop area, rather than under the wet well as was originally thought.

Recommended solution:
See Page 2 of 2, Recommended Solution (continued).

Impact on present and completed work: Additional cost for sample collection and analysis will be incurred.

Requested by: Nora Okusu, Project Manager

Recommended solution/disposition: *Concur with recommended solution.*

Clarification ☐ Minor Change ☒ Major Change ☐

Signature [signature] Date 1/3/02
Technical Reviewer

IT Corporation Approvals: *If Major Change:*

Signature _____ Date _____
Project/Task Manager

Signature [signature] Date 1/3/02
Sr. Project Manager

Signature [signature] Date 1-3-02
Project CQCSM

USACE Approval: *If Major Change:*

Approved ☐ Rejected ☐ Signature _____ Date _____
USACE PM or COR

UDEQ Approval: *If Major Change:*

Approved ☐ Rejected ☐ Signature _____ Date _____
Agency Representative

Final Description FOUR OF THE SOIL SAMPLES WERE COLLECTED IN ACCORDANCE WITH THE FWV ON 3 JAN 02. THE FIFTH SAMPLE (FROM THE WET WELL) REMAINS TO BE COLLECTED. [signature] 1-9-02
THE FIFTH SAMPLE (FROM THE WET WELL) WAS COLLECTED IN ACCORDANCE WITH THE FWV ON 10 JAN 2002.

Signature [signature] Date 1-21-02

FIELD WORK VARIANCE CONTINUATION SHEET

Continue FWV discussions below by noting section title(s) to be continued (i.e., Problem Description, Solution/disposition, Final Disposition, etc). Use additional continuation sheets as needed.

Recommended Solution (continued):

Four additional soil samples to characterize the soil near and under the shop will be collected. To verify that the soil contamination is not also under the wet well, a soil sample will be collected under the slab of the wet well near the boundary with the shop area.

The locations of these five samples are shown in the attached sketch explained as follows: One sample shall be collected from below the floor of the wet well or "sump" closest to the building corner where the angle borings were identified. Sample depth will be approximately 18 feet bgs and the sample will be collected from the excavator bucket after the sump is drained and concrete is broken. Four samples will be collected at depths of 14' and 17' bgs at the north side of Building 41. The 17-foot samples will be collected under the slab and the 14-foot samples will be collected slightly north of Building 41, as shown in the attached sketch. These samples will be collected from the excavator bucket after the area is drained. All samples affected by this FWV shall be analyzed for TPH (extractable) only. This sampling event shall coincide with planned sampling of other Building 41 area sampling and quality control protocols will be based on the multiple activities as a whole. Revision of the planned sample table for Building 41 Area Sampling is also included as an attachment to this FWV.

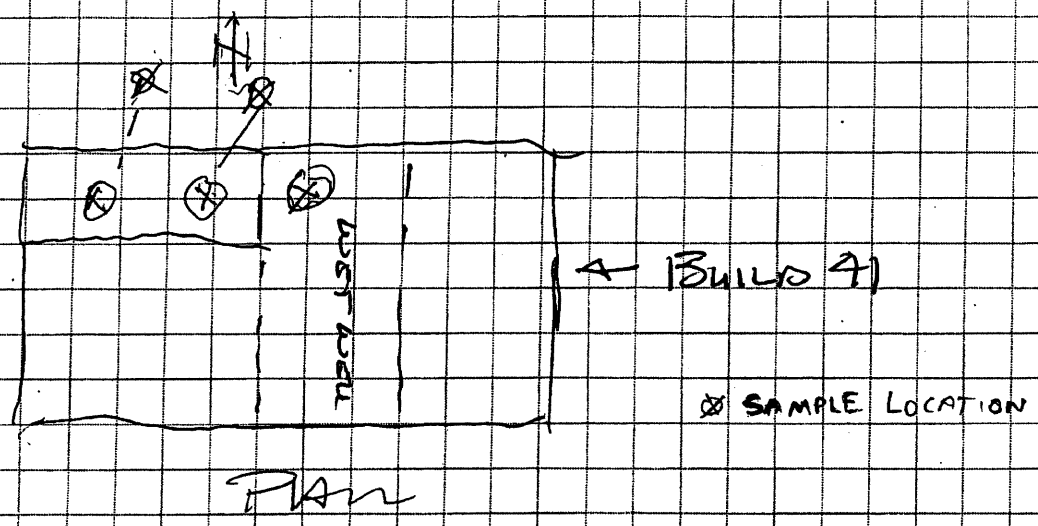
Attachments:

- Figure 1– Building 41 Area Sample Locations
- Sketches of Building 41 plan view and profile
- Planned Sample Table

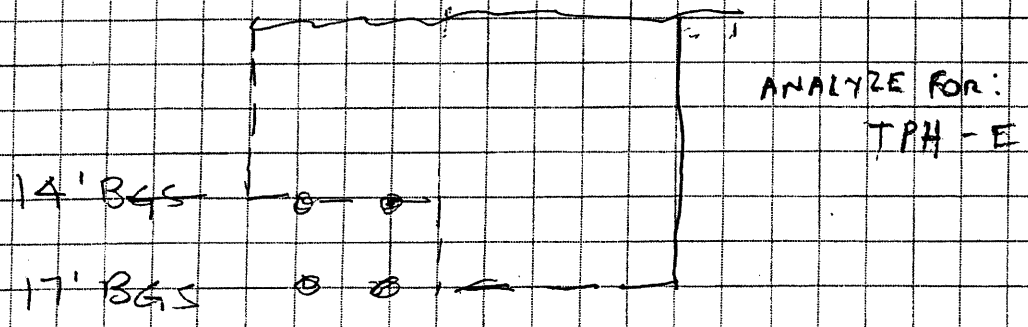
HANSON CONCRETE PRODUCTS, INC.

ONE HANSON COURT
MILPITAS, CALIFORNIA 95035
(408) 262-1091 FAX: (408) 262-0936

8364 INDUSTRIAL AVENUE
COTATI, CALIFORNIA 94928
(707) 792-2565 FAX: (707) 792-2574



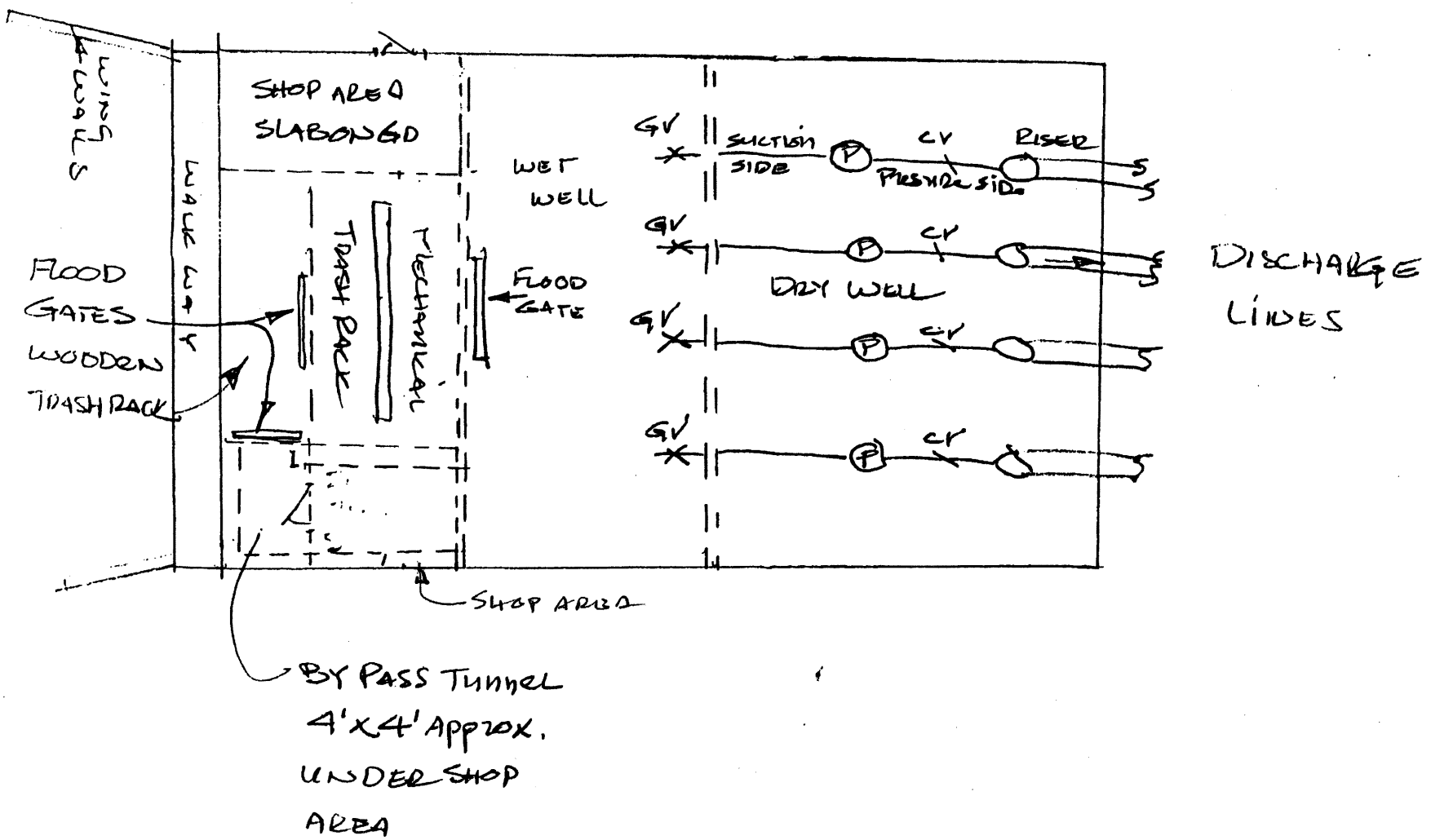
PLAN

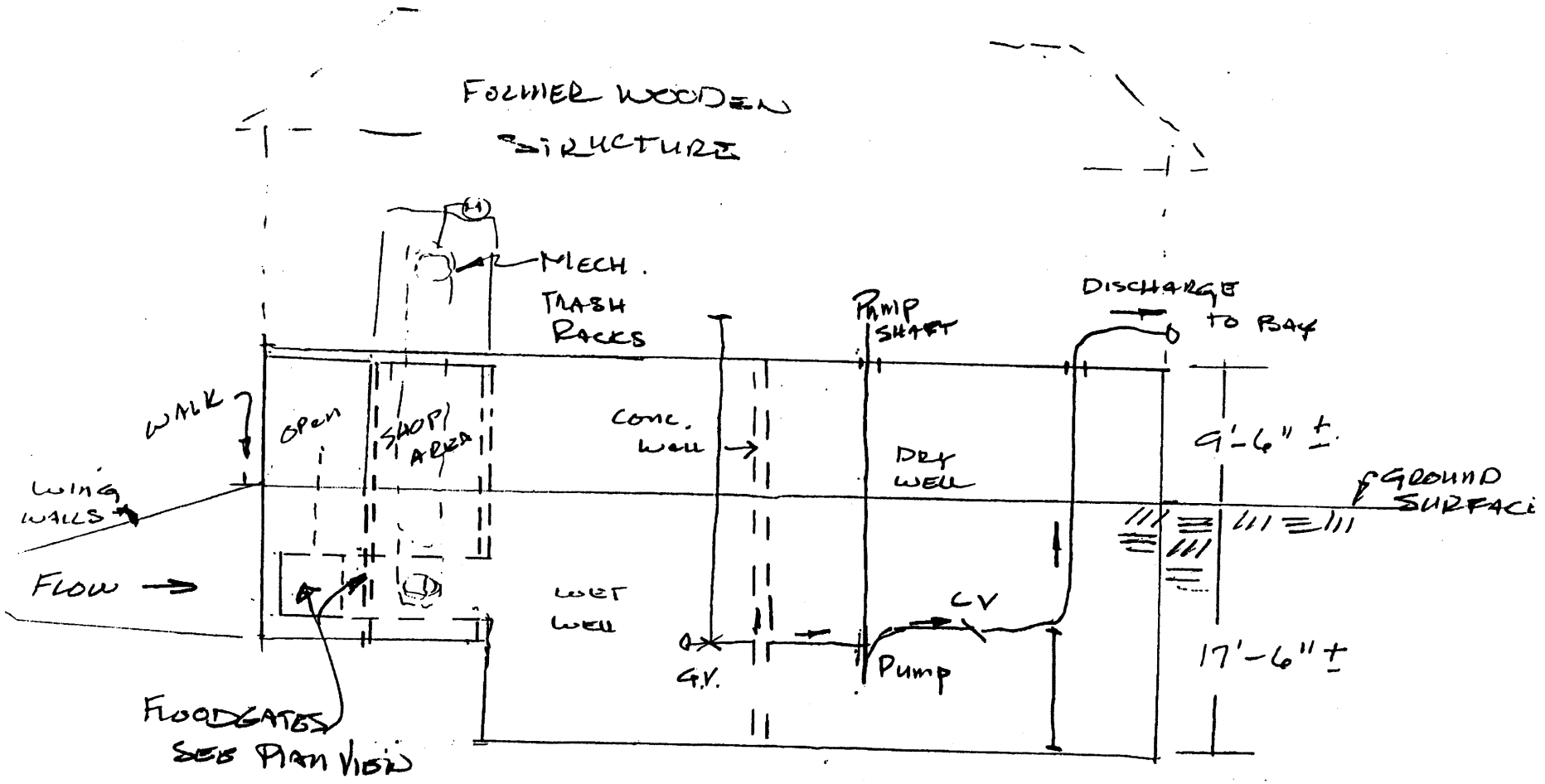


ANALYZE FOR:
TPH - E

SECTION

BUILD: APPROX 60'x35'x26' DEEP





SOUTH SIDE

NOTE: SINGLE LINE OF PIPING SEE PLAN VIEW

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Area: HAAF Remedial Action Areas

Table 1: Planned Sample Table Building 41

Sample Location	Sample Index No.	Sample Matrix	Sample Type	Depth (ft bgs)	Schedule	VOCs - 8260B	TPHg - 8015	TPH-d,mo - 8015	SVOCs-8270C	PAHs - 8310	Metals - 6010B	Metals - 6010B/7470A/7471A	Pesticides - 8081A	PCB - 8082	RCI - SW7.4	Total Containers	Laboratory	Comments
					Soil Preservative	Ice 2-6C	Ice 2-6C	Ice 2-6C	Ice 2-6C	Ice 2-6C	Ice 2-6C	Ice 2-6C	Ice 2-6C	Ice 2-6C	Ice 2-6C			
					Liquid Preservative	None	None	None	None	None	HNO_3	HNO_3	None	None	None			
					Non-Aqueou	3x5g E	3x5g E	1x8oz Jar	1x8oz Jar		1x8oz Jar	1x8oz Jar	1x8oz Jar	1x8oz Jar				
					Aqueous	3x40mL V	3x40mL V	2x1L A	2x1L A	2x1L A	1x0.5L P	1x0.5L P	2x1L A	2x1L A	2x1L A			
HB41L601		SO	NS					X								1	APCL	Bldg 41
HB41L602		SO	NS					X								1	APCL	Bldg 41
HB41L603		SO	NS					X								1	APCL	Bldg 41
HB41L604		SO	NS					X								1	APCL	Bldg 41
HB41L605		SO	NS					X								1	APCL	Bldg 41
					Total Analyses	0	0	5	0	0	0	0	0	0	0			

Matrix: SO - Soil

Sample Type: NS - normal sample

A - Amber Glass; E - EnCore Sampler; P - Polyethylene; V - Volatile Organic Analysis Vial

IT Corporation
4005 Port Chicago Highway
Concord, CA 94520-1120
Tel. 925.288.9898
Fax. 925.288.0888

A Member of The IT Group

January 9, 2002

DCN: ACE13-031-H

Mr. Fred J. Strickland, Contracting Officer CT-B
U.S. Army Corps of Engineers, Sacramento District
1325 "J" Street, TERC Unit 9th Floor
Sacramento, California 95814

Subject: **Sacramento TERC II – Contract No. DACW05-96-D-0011**
Contract Task Order No. 13, WAD 4
Hamilton Army Airfield, Novato, CA
Field Work Variance 831471-004

Dear Mr. Strickland:

Enclosed is Field Work Variance (FWV) 831471-004 for the expansion of the excavation area around Spoils Pile F. Should you have any questions regarding this FWV, please contact me at (925) 288-2253.

Sincerely,

Nora M. Okusu
Senior Project Manager

Enclosure

cc:

IT Corp.	USACE	HAAF
V. Taylor	R. Zimny	E. Keller (2 copies)
S. Elkind	C. Fong	
D. Bushnell		
M. Reed		
TERC II Files		

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Field Work Variance No. 831471-004

Page 1 of 2

FIELD WORK VARIANCE

Project Name/Number	Hamilton Army Airfield / 831471	CTO/WADs	13 / 4
Applicable Document	1. Work Plan for Bldg. 41 Demolition, Spoils Pile F Removal, and Revetments 6 & 7 Removal, Rev. 1 (Dec 2001). 2. FWV 002 (2 JAN 02)	Date	8 JAN 02

Problem Description: The analytical results for the characterization soil samples collected near Spoils Pile F indicate that pesticide contamination extends further than the previously-delineated extent of Spoils Pile F. A soil sample collected west of the Spoils Pile F planned excavation area contained total DDTs (the sum of DDT, DDD, and DDE) at a concentration that exceeds the comparator value of 7 µg/kg. A soil sample collected northeast of the planned Spoils Pile F excavation area also contained total DDTs at a concentration that exceeds the comparator value.

Recommended solution:

See Page 2 of 2, Recommended Solution (continued).

Impact on present and completed work: Additional costs for soil excavation, sampling, and disposal will be incurred.

Requested by: Nora Okusu, Project Manager

Recommended solution/disposition: *Concur with recommended solution.*

Clarification ☐ Minor Change ☒ Major Change ☐

Signature [signature] Date 1/9/02
Technical Reviewer

IT Corporation Approvals: *If Major Change:*

Signature _____ Date _____
Project/Task Manager

Signature [signature] Date 1/8/02
Sr. Project Manager

Signature [signature] Date 1-8-02
Project CQCSM

USACE Approval: *If Major Change:*

Approved ☐ Rejected ☐ Signature _____ Date _____
USACE PM or COR

UDEQ Approval: *If Major Change:*

Approved ☐ Rejected ☐ Signature _____ Date _____
Agency Representative

Final Description

Signature _____ Date _____

FIELD WORK VARIANCE CONTINUATION SHEET

Continue FWV discussions below by noting section title(s) to be continued (i.e., Problem Description, Solution/disposition, Final Disposition, etc). Use additional continuation sheets as needed.

Recommended Solution (continued):

The area to be excavated during the Spoils Pile F removal will be enlarged as follows to include the following areas (as shown on Figure 2):

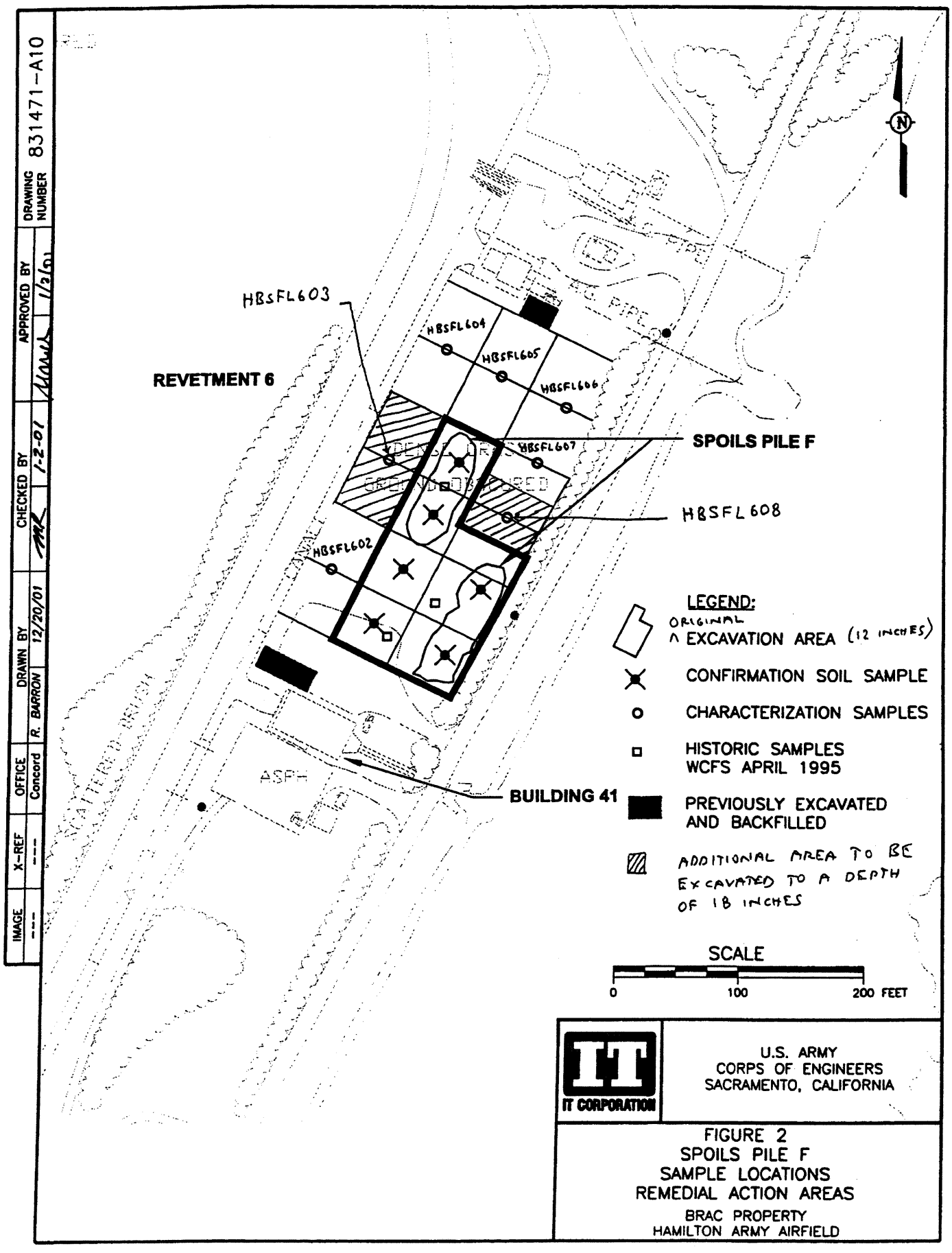
1. At sample HBSFL608, center the sample in the excavation and excavate 25 feet in the four directions to make a 50 ft sided square. Excavate to 18 inches in this area.
2. At sample point HBSFL603, excavate 50 feet to the north and south and from the PDD to the planned Spoil Pile F excavation. Excavate to a depth of 18 inches.

The original excavation area will be excavated to a depth of 12 inches, as stated in the Work Plan.

Stage the soil on a revetment per the Work Plan. Collect waste profile samples per the Sampling and Analysis Plan. Dispose of the soil per the Work Plan.

Attachments:

- Figure 2– Spoils Pile F Sample Locations (showing updated extent of excavation.)


HBsFL603
REVETMENT 6
HBSFL604
HBSFL605
HBSFL606
HBSFL607
SPOILS PILE F
HBSFL608
HBSFL602
BUILDING 41
ASPH
LEGEND:
ORIGINAL EXCAVATION AREA (12 INCHES)
CONFIRMATION SOIL SAMPLE
CHARACTERIZATION SAMPLES
HISTORIC SAMPLES WCFS APRIL 1995
PREVIOUSLY EXCAVATED AND BACKFILLED
ADDITIONAL AREA TO BE EXCAVATED TO A DEPTH OF 18 INCHES
SCALE
0
100
200 FEET
IT CORPORATION
U.S. ARMY
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA
FIGURE 2
SPOILS PILE F
SAMPLE LOCATIONS
REMEDIAL ACTION AREAS
BRAC PROPERTY
HAMILTON ARMY AIRFIELD
IMAGE
X-REF
OFFICE
Concord
DRAWN BY
R. BARRON
12/20/01
CHECKED BY
1-2-01
APPROVED BY
1/2/01
DRAWING NUMBER
831471-A10

IT Corporation
4005 Port Chicago Highway
Concord, CA 94520-1120
Tel. 925.288.9898
Fax. 925.288.0888

A Member of The IT Group

January 25, 2002

DCN: ACE13-036-H

Mr. Fred J. Strickland, Contracting Officer CT-B
U.S. Army Corps of Engineers, Sacramento District
1325 "J" Street, TERC Unit 9th Floor
Sacramento, California 95814

Subject: **Sacramento TERC II – Contract No. DACW05-96-D-0011**
Contract Task Order No. 13, WAD 4
Hamilton Army Airfield, Novato, CA
Field Work Variances 831471-005 through 009

Dear Mr. Strickland:

Enclosed are Field Work Variances (FWV) 831471-005 through 009 for the work at Building 41. Should you have any questions regarding these FWVs, please contact me at (925) 288-2253.

Sincerely,

Nora M. Okusu
Senior Project Manager

Enclosure

cc:

IT Corp.	USACE	HAAF
V. Taylor	R. Zimny	E. Keller (2 copies)
S. Elkind	C. Fong	
D. Bushnell		
M. Reed		
TERC II Files		

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Field Work Variance No. 831471-005

Page 1 of 2

FIELD WORK VARIANCE

Project Name/Number	Hamilton Army Airfield / 831471	CTO/WADs	13 / 4
Applicable Document	1. Work Plan for Bldg. 41 Demolition, Spoils Pile F Removal, and Revetments 6 & 7 Removal, Rev. 1 (Dec 2001).	Date	23 JAN 02

Problem Description: The slanted boring previously drilled on the north side of Building 41 was thought to have gone under the wet well. TPH-d and PAHs were detected in the bottom soil sample. For this reason, a figure in the Feasibility Study Report and RAP/ROD shows that an area of soil under the wet well must be excavated. However, when we measured the depth of the wet well, we discovered that the top of the concrete is 17-1/2 feet below grade. Since the slanted boring only extended 18 feet below grade, the boring could not have extended under the wet well.

Recommended solution:
See Page 2 of 2, Recommended Solution (continued).

Impact on present and completed work: Additional costs for soil excavation, sampling, and disposal will be incurred.

Requested by: Nora Okusu, Project Manager

Recommended solution/disposition: *Concur with recommended solution.*

Clarification ☐ Minor Change ☒ Major Change ☐

Signature _____ Date 1/24/02
Technical Reviewer

IT Corporation Approvals: *If Major Change:*

Signature _____ Date _____ Signature _____ Date _____
Project/Task Manager *Sr. Project Manager*

Signature _____ Date 1-24-02
Project CQCSM

USACE Approval: *If Major Change:*

Approved ☒ Rejected ☐ Signature _____ Date 1/25/02
USACE PM or COR

UDEQ Approval: *If Major Change:*

Approved ☐ Rejected ☐ Signature _____ Date _____
Agency Representative

Final Description

Signature _____ Date _____

IT CORPORATION
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FIELD WORK VARIANCE CONTINUATION SHEET

Continue FWV discussions below by noting section title(s) to be continued (i.e., Problem Description, Solution/disposition, Final Disposition, etc). Use additional continuation sheets as needed.

Recommended Solution (continued):

1. Excavate north of Building 41 to find the locations of the former borings, which were grouted. The result of performing this step was that two borings were found. One boring was drilled to the southwest and extends under the shop area of Building 41 (rather than under the wet well.) One boring terminated at the edge of Building 41. Joe Strack (IT geotechnical engineer), who was present when the original borings were drilled, confirmed that one boring was not sampled because refusal occurred. The boring headed toward the southwest was identified as being the boring that was sampled.
2. Collect a total of four samples north of Building 41, in the area under the shop (which has been demolished.) The samples shall be collected at depths of 14 and 17 feet below grade. The samples shall be collected from the excavator bucket at the locations shown in the attached figure.
3. Analyze the samples for TPH-d,mo. The only analyte that exceeded its comparator value in the sample collected from the slant boring was TPH-d.
4. Collect one sample under the wet well. This sample will be used to show that soil under the wet well does not contain TPH-d,mo at a concentration that exceeds the comparator value. This sample will be collected by punching through the concrete floor of the wet well using the hammer on the excavator and then collecting a scoop of the underlying soil in the excavator bucket. The actual soil sample will be collected from the excavator bucket. To prevent cross-contamination, water will be pumped from the wet well, and the gravel layer under the concrete slab will also be dewatered. The location of the sample (605) is shown on the attached figure.

Attachments:

- Figure showing locations of soil samples collected under the Building 41 shop area.
- Figure showing the location of the sample collected under the wet well (Sample 605).

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FIELD ACTIVITY DAILY LOG

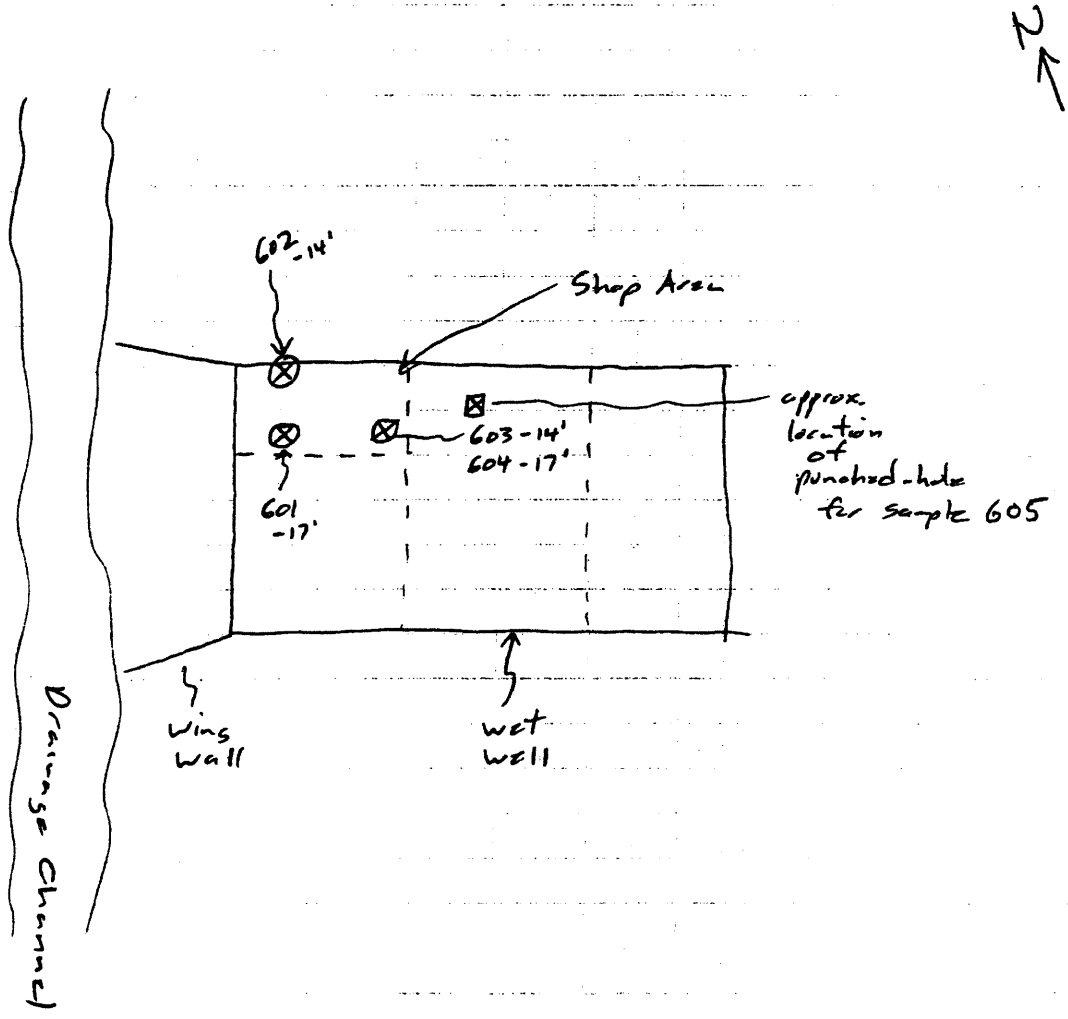
DAILY LOG			
DATE	01	03	02
NO.			
SHEET	OF		

PROJECT NAME: Hamilton AAF Bldg 41

PROJECT NO.: 831471

FIELD ACTIVITY SUBJECT:

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:



VISITORS ON SITE:

CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS:

WEATHER CONDITIONS:

IMPORTANT TELEPHONE CALLS:

IT PERSONNEL ON SITE:

SIGNATURE:

DATE: 1/3/02

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FIELD ACTIVITY DAILY LOG

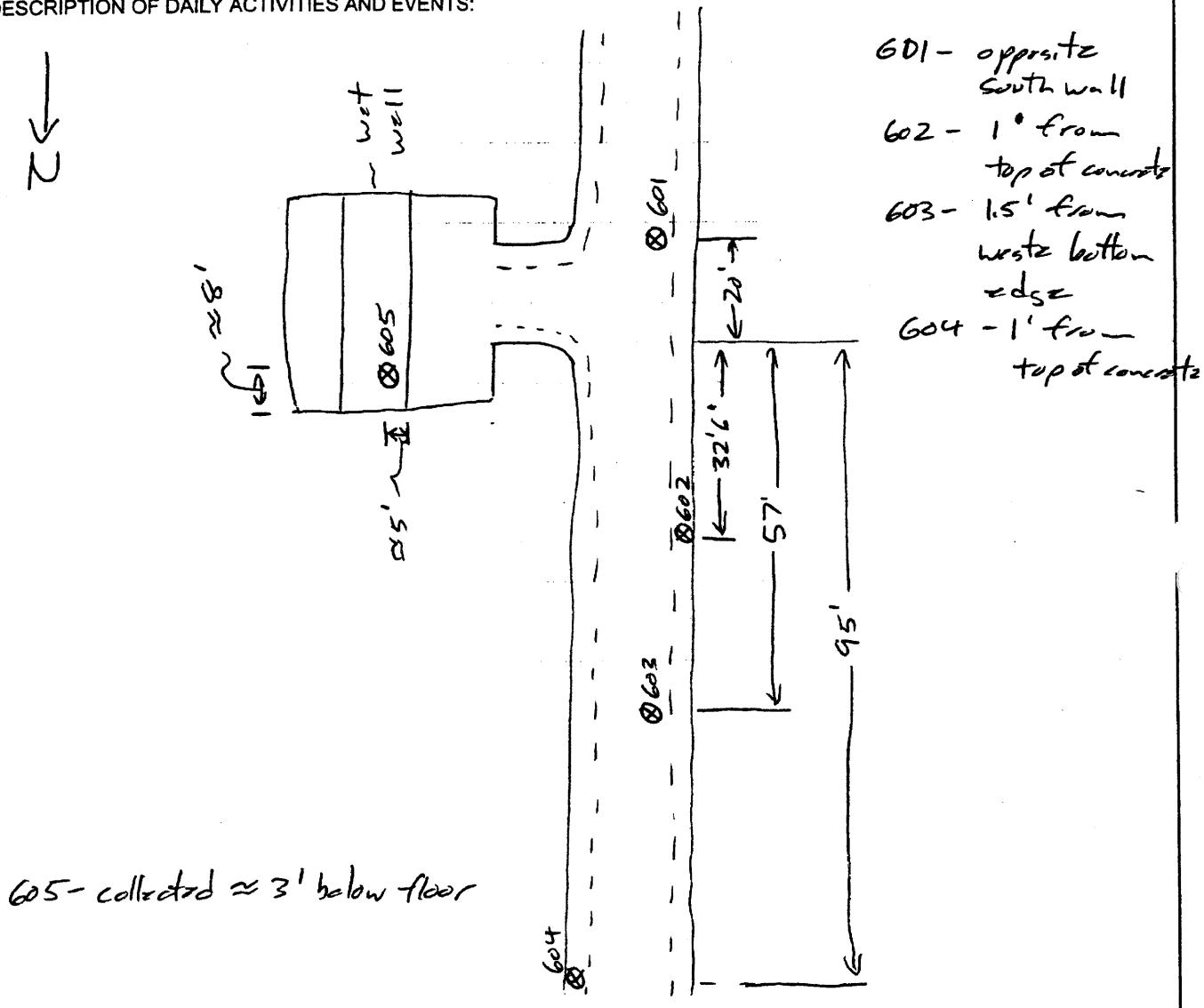
DAILY LOG	DATE	01	10	02
	NO.			
	SHEET	OF		

PROJECT NAME: HAAF Bldg 41, etc.

PROJECT NO.: 831471

FIELD ACTIVITY SUBJECT:

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:



VISITORS ON SITE:

CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS:

WEATHER CONDITIONS:

IMPORTANT TELEPHONE CALLS:

IT PERSONNEL ON SITE:

SIGNATURE:

DATE:

377C-12-98

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Field Work Variance No. 831471-006

Page 1 of 2

FIELD WORK VARIANCE

Project Name/Number	Hamilton Army Airfield / 831471	CTO/WADs	13 / 3
Applicable Document	1. Work Plan for Bldg. 41 Demolition, Spoils Pile F Removal, and Revetments 6 & 7 Removal, Rev. 1 (Dec 2001).	Date	23 JAN 02

Problem Description: During a site inspection, an oily-looking liquid was observed in a conduit near the transformer pad. The US Army Corps of Engineers collected a sample of the substance. There is the possibility that a release of oil or fuel has occurred near the transformer pad. The RAP/ROD for the project requires that soil contaminated with chemicals at levels that exceed the comparator values be excavated and disposed off site.

Recommended solution:
See Page 2 of 2, Recommended Solution (continued).

Impact on present and completed work: Additional costs for soil excavation, sampling, and disposal will be incurred.

Requested by: Nora Okusu, Project Manager

Recommended solution/disposition: *Concur with recommended solution.*

Clarification ☐ Minor Change ☒ Major Change ☐

Signature [signature] Date 1/24/02
Technical Reviewer

IT Corporation Approvals: *If Major Change:*

Signature _____ Date _____ Signature _____ Date _____
Project/Task Manager *Sr. Project Manager*

Signature [signature] Date 1-24-02
Project CQCSM

USACE Approval: *If Major Change:*

Approved ☒ Rejected ☐ Signature [signature] Date 1/25
USACE PM or COR

UDEQ Approval: *If Major Change:*

Approved ☐ Rejected ☐ Signature _____ Date _____
Agency Representative

Final Description

Signature _____ Date _____

IT CORPORATION
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FIELD WORK VARIANCE CONTINUATION SHEET

Continue FWV discussions below by noting section title(s) to be continued (i.e., Problem Description, Solution/disposition, Final Disposition, etc). Use additional continuation sheets as needed.

Recommended Solution (continued):

1. Demolish the concrete transformer pad.
2. Excavate the visibly contaminated soil (an area of 12 by 15 feet, to a depth of approximately 4 feet).
3. Collect a total of 5 soil samples: One from each sidewall and one from the bottom.
4. Analyze the soil samples for TPH-ex and PCBs.

Attachments:

- Figure showing locations of soil samples collected in transformer pad excavation.

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FIELD ACTIVITY DAILY LOG

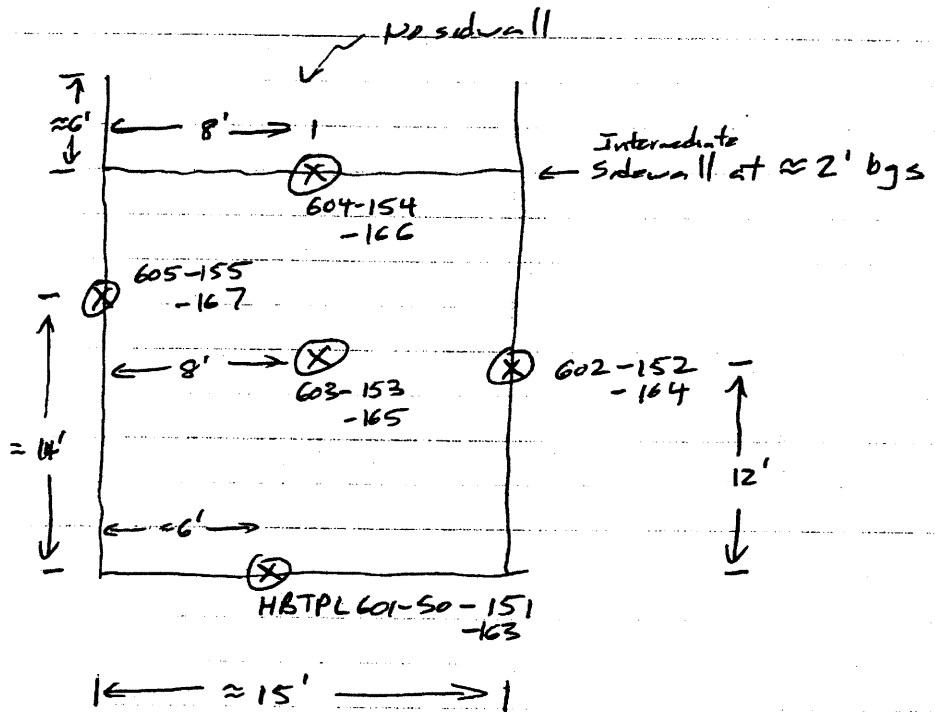
DAILY LOG			
DATE	01	23	02
NO.			
SHEET	1	OF	1

PROJECT NAME: HAAF/Bldg 41, etc. PROJECT NO.: 831471

FIELD ACTIVITY SUBJECT: Transformer Pad Excavation

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

N



Second set of No. collected 1/24/02 for TPH-g.

VISITORS ON SITE:	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS:
WEATHER CONDITIONS:	IMPORTANT TELEPHONE CALLS:

IT PERSONNEL ON SITE:

SIGNATURE: DATE:

IT CORPORATION
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Field Work Variance No. 831471-007

Page 1 of 2

FIELD WORK VARIANCE

Project Name/Number	Hamilton Army Airfield / 831471	CTO/WADs	13 / 3
Applicable Document	1. Work Plan for Bldg. 41 Demolition, Spoils Pile F Removal, and Revetments 6 & 7 Removal, Rev. 1 (Dec 2001).	Date	23 JAN 02

Problem Description: The results of analysis of the confirmation samples collected in the L-shaped excavation located west of Building 41 indicate that exceedances of the comparator values occurred at four locations. There were two exceedances for TPH-d (Samples 608 and 610) and two exceedances for 2-methylnaphthalene (Samples 606 and 609.)

Recommended solution:
See Page 2 of 2, Recommended Solution (continued).

Impact on present and completed work: Additional costs for soil excavation, sampling, and disposal will be incurred.

Requested by: Nora Okusu, Project Manager

Recommended solution/disposition: *Concur with recommended solution.*

Clarification ☐ Minor Change ☒ Major Change ☐

Signature _____ Date 1/24/02
Technical Reviewer

IT Corporation Approvals: *If Major Change:*

Signature _____ Date _____ Signature _____ Date _____
Project/Task Manager *Sr. Project Manager*

Signature _____ Date 1-24-02
Project CQCSM

USACE Approval: *If Major Change:*

Approved ☒ Rejected ☐ Signature _____ Date 1/25/02
USACE PM or COR

UDEQ Approval: *If Major Change:*

Approved ☐ Rejected ☐ Signature _____ Date _____
Agency Representative

Final Description

Signature _____ Date _____

IT CORPORATION
A Member of The IT Group

FIELD WORK VARIANCE CONTINUATION SHEET

Continue FWV discussions below by noting section title(s) to be continued (i.e., Problem Description, Solution/disposition, Final Disposition, etc). Use additional continuation sheets as needed.

Recommended Solution (continued):

1. Ed Keller, the HAAF BEC, stated that if only one PAH compound exceeds its comparator value, then the regulators allow the Army to use the total PAH comparator concentration of 4.02 mg/kg. The concentrations of 2-methylnaphthalene measured in Samples 606 and 609 were well below this level. Therefore, we were directed by Mr. Keller not to over-excavate at the locations of Samples 606 and 609.
2. We over-excavated an additional 5 feet laterally along the PDD beyond sample 610 and collected confirmation sample 615. At sample location 608, we over-excavated another two feet in depth and collected sample 616. All samples will be analyzed for the Building 41 contaminants of concern (TPH-d and the selected Building 41 PAHs.)

Attachments:

- Figure showing locations of soil samples collected in L-shaped excavation west of Building 41.

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FIELD ACTIVITY DAILY LOG

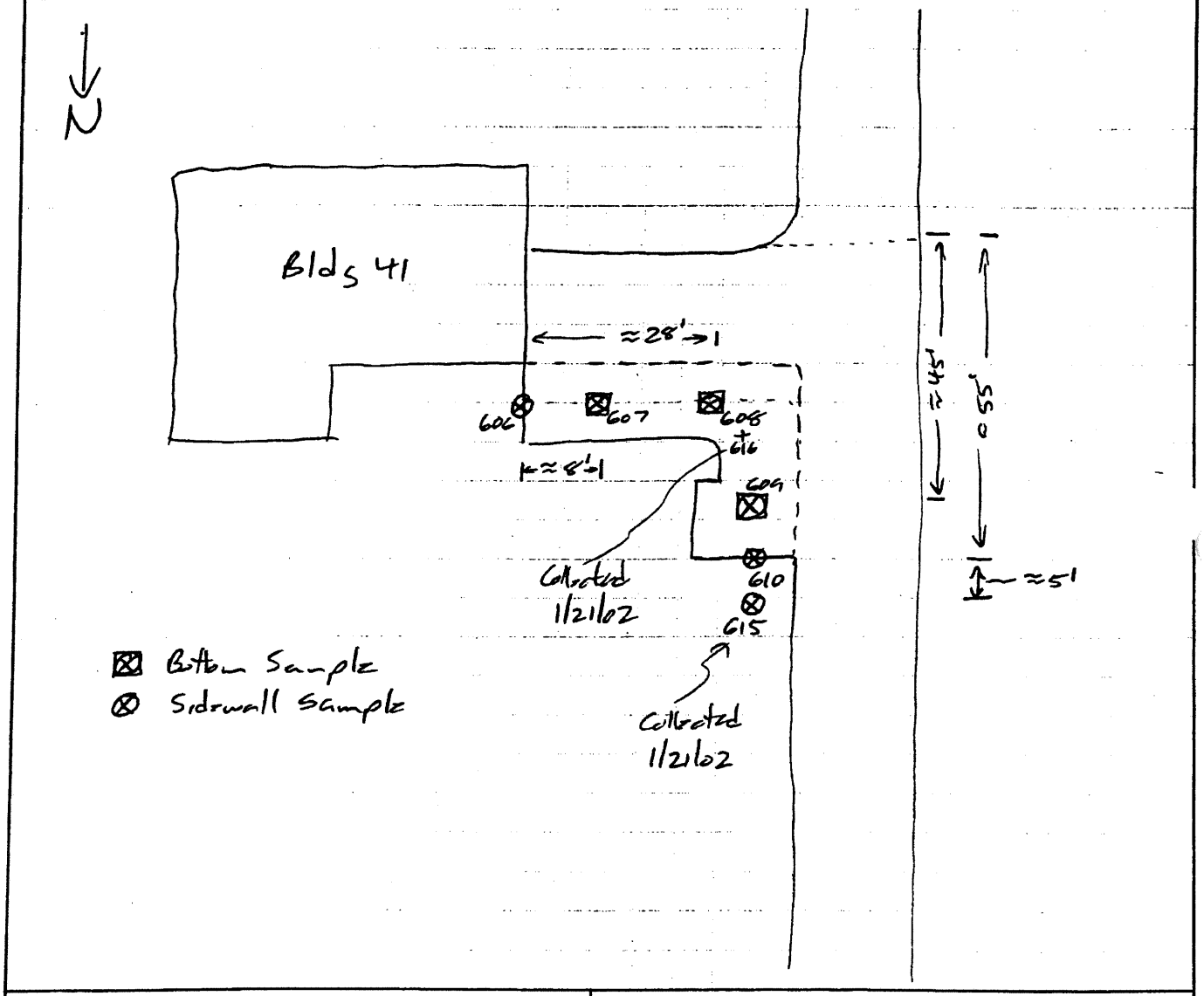
DAILY LOG			
DATE	01	14	02
NO.			
SHEET 1 OF 1			

PROJECT NAME: HAAF Bldg 41, etc.

PROJECT NO.: 831471

FIELD ACTIVITY SUBJECT: L-Shaped Excavation

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:



VISITORS ON SITE:

CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS:

WEATHER CONDITIONS:

IMPORTANT TELEPHONE CALLS:

IT PERSONNEL ON SITE:

SIGNATURE: [illegible]

DATE: 1/14/02

IT CORPORATION
A Member of The IT Group

Field Work Variance No. 831471-008

Page 1 of 2

FIELD WORK VARIANCE

Project Name/Number	Hamilton Army Airfield / 831471	CTO/WADs	13 / 3
Applicable Document	1. Work Plan for Bldg. 41 Demolition, Spoils Pile F Removal, and Revetments 6 & 7 Removal, Rev. 1 (Dec 2001).	Date	23 JAN 02

Problem Description: During the excavation along the north side of Building 41 to create a bench for excavator access to the Building 41 slab, stained soil was observed at depth. The staining appeared to be from fuel contamination. The RAP/ROD for the project requires that all soil that contains chemicals at concentrations that exceed their respective comparator values be excavated and disposed off site.

Recommended solution:
See Page 2 of 2, Recommended Solution (continued).

Impact on present and completed work: Additional costs for soil excavation, sampling, and disposal will be incurred.

Requested by: Nora Okusu, Project Manager

Recommended solution/disposition: *Concur with recommended solution.*

Clarification ☐ Minor Change ☒ Major Change ☐

Signature [signature] Date 1/24/02
Technical Reviewer

IT Corporation Approvals: *If Major Change:*

Signature _____ Date _____ Signature _____ Date _____
Project/Task Manager *Sr. Project Manager*

Signature [signature] Date 1-24-02
Project CQCSM

USACE Approval: *If Major Change:*

Approved ☒ Rejected ☐ Signature [signature] Date 1/25/02
/S/ USACE PM or COR

UDEQ Approval: *If Major Change:*

Approved ☐ Rejected ☐ Signature _____ Date _____
Agency Representative

Final Description

Signature _____ Date _____

IT CORPORATION
A Member of The IT Group

Field Work Variance No. 831471-008

FIELD WORK VARIANCE CONTINUATION SHEET

Continue FWV discussions below by noting section title(s) to be continued (i.e., Problem Description, Solution/disposition, Final Disposition, etc). Use additional continuation sheets as needed.

Recommended Solution (continued):

1. Excavate the visibly contaminated soil (an area of 20 by 20 feet. to a depth of approximately 18 feet).
2. Collect a total of 4 soil samples: One from each sidewall and one from the bottom. The excavation is flush against the wall of the dry well sump on the south side, so a sidewall sample was not collected.
3. At the direction of Ed Keller on 17 Jan 02, these samples were sent to the laboratory and the requested analysis was for TPH-d,mo only. On 23 Jan 02, Mr. Keller requested that these samples be analyzed for the PAHs that are identified as chemcals of concern for the Building 41 site. As a result, the analytical suite for these four samples is consistent with the Building 41 COC list.
4. Subsequent to excavation of this area, additional soil staining and the apparent presence of diesel along the northern side of Building 41 was observed. The diesel apparently migrated between the concrete/soil interface. Overexcavation was performed along the northern sump wall, and an additional soil sample (Sample 150) was collected on the western side of the trench. The sample was analyzed for TPH-d,mo.

Attachments:

- Figure showing locations of soil samples collected north of Building 41.

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A Member of The IT Group

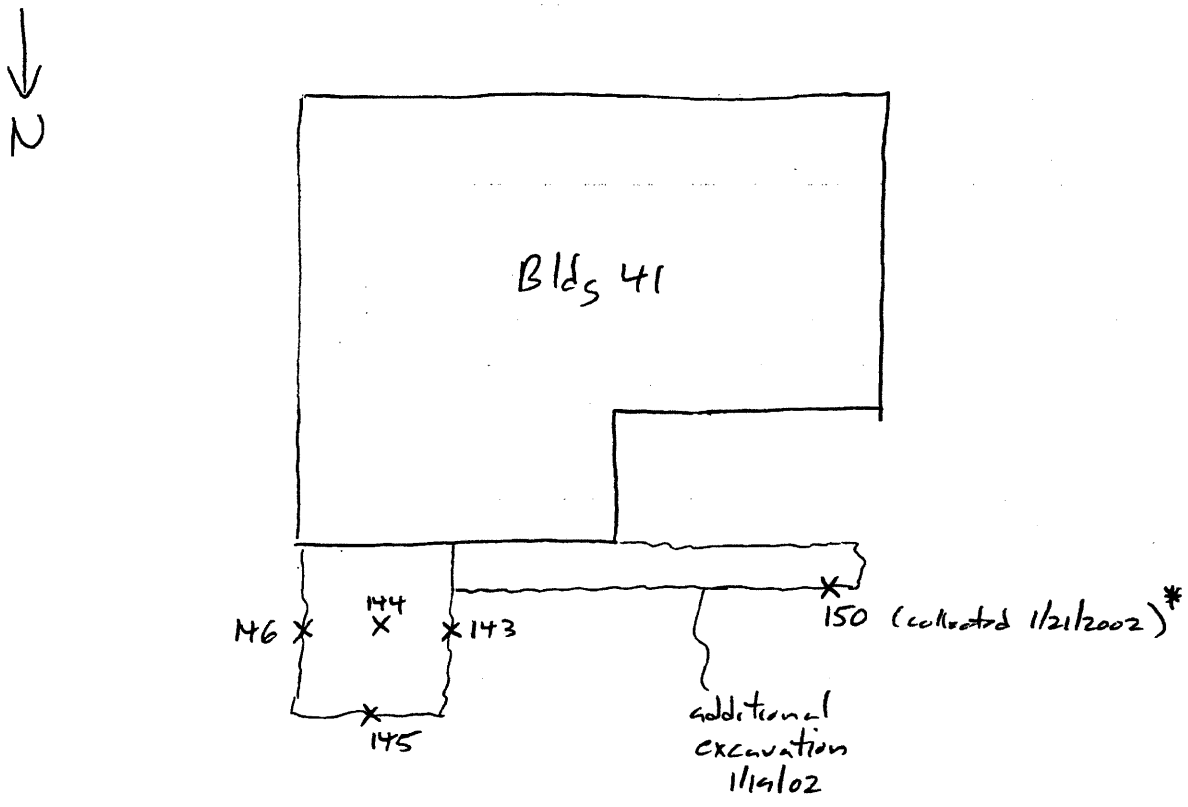
FIELD ACTIVITY DAILY LOG

DAILY LOG			
DATE	01	17	02
NO.			
SHEET	1 OF 1		

PROJECT NAME: HAAF Bldg 41, etc. PROJECT NO.: 831471

FIELD ACTIVITY SUBJECT: N. Bldg 41 Excavation

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:



Not to Scale

VISITORS ON SITE:	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS:
WEATHER CONDITIONS:	IMPORTANT TELEPHONE CALLS:

IT PERSONNEL ON SITE:

SIGNATURE: [signature] DATE: 01/17/02

IT CORPORATION
A Member of The IT Group

Field Work Variance No. 831471-009

Page 1 of 2

FIELD WORK VARIANCE

Project Name/Number	Hamilton Army Airfield / 831471	CTO/WADs	13 / 4
Applicable Document	1. Work Plan for Bldg. 41 Demolition, Spoils Pile F Removal, and Revetments 6 & 7 Removal, Rev. 1 (Dec 2001). 2. FWV 831471-004	Date	23 JAN 02

Problem Description: Due to the increased size of the Spoils Pile F excavation and the fact that it now includes the truck access area, the time required for Spoils Pile F excavation has been extended. To allow collection of the confirmation samples such that analytical results can be received and any needed overexcavation performed prior to 31 Jan 02, Mr. Keller requested that we collect the Spoils Pile F confirmation samples by potholing to the designated depth and then sampling from the excavator bucket.

Recommended solution:

See Page 2 of 2, Recommended Solution (continued).

Impact on present and completed work: None.

Requested by: Nora Okusu, Project Manager

Recommended solution/disposition: *Concur with recommended solution.*

Clarification ☐ Minor Change ☒ Major Change ☐

Signature [signature] Date 1/24/02
Technical Reviewer

IT Corporation Approvals: *If Major Change:*

Signature _____ Date _____ Signature _____ Date _____
Project/Task Manager *Sr. Project Manager*

Signature [signature] Date 1-24-02
Project CQCSM

USACE Approval: *If Major Change:*

Approved ☒ Rejected ☐ Signature [signature] Date 1/25/02
USACE PM or COR

UDEQ Approval: *If Major Change:*

Approved ☐ Rejected ☐ Signature _____ Date _____
Agency Representative

Final Description

Signature _____ Date _____

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FIELD WORK VARIANCE CONTINUATION SHEET

Continue FWV discussions below by noting section title(s) to be continued (i.e., Problem Description, Solution/disposition, Final Disposition, etc). Use additional continuation sheets as needed.

Recommended Solution (continued):

1. Sample locations were marked in the field using the grid previously established (refer to Figure 2 associated with FWV 831471-002).
2. The excavator was used to dig down to the prescribed depth at each sample location (either 12 inches or 18 inches).
3. The excavator bucket was then used to scrape a 6-10 inch layer of soil immediately under the prescribed excavation depth and the soil sample was collected from the bucket using a disposable scoop.

Attachments:

- None.

IT Corporation
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February 14, 2002

DCN: ACE13-041-H

Mr. Doug Stanley, Contracting Officer CT-B
U.S. Army Corps of Engineers, Sacramento District
1325 "J" Street, TERC Unit 9th Floor
Sacramento, California 95814

Subject: **Sacramento TERC II – Contract No. DACW05-96-D-0011**
Contract Task Order No. 13, WAD 4
Hamilton Army Airfield, Novato, CA
Field Work Variances 831471-010

Dear Mr. Stanley:

Enclosed is Field Work Variance (FWV) 831471-010, which proposes a minor change to well abandonment procedures. Should you have any questions regarding this FWV, please contact me at (925) 288-2253.

Sincerely,

Nora M. Okusu
Senior Project Manager

Enclosure

cc:

IT Corp.	USACE	HAAF
V. Taylor	R. Zimny	E. Keller (2 copies)
S. Elkind	C. Fong	
D. Bushnell		
L. Mason		
D. Bero		
M. Reed		
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Field Work Variance No. 831471-010

Page 1 of 1

FIELD WORK VARIANCE

Project Name/Number	Hamilton Army Airfield / 831471	CTO/WADs	13 / 2
Applicable Document	Work Plan for Monitoring Well Abandonment, Rev. 0 (Dec 2001)	Date	14 Feb 02

Problem Description: The Work Plan for Monitoring Well Abandonment Section 3.2.2, *Well Abandonment Procedures*, states bentonite cement grout will be placed in the monitoring well borehole using a tremie pipe. The Subcontractor for well abandonment services prefers to use the hollow stem auger in-place during the overdrilling portion of the abandonment as a tremie. A clarification to the Work Plan is recommended to authorize this minor variance.

Additionally, during abandonment activities of five groundwater monitoring wells on 29 January 2002, the Subcontractor used the hollow stem auger as a tremie for grout placement and used only cement rather than bentonite cement. Although these procedures were not in conformance with the Work Plan, they do conform to Marin County well abandonment requirements.

Recommended solution: Allow the Subcontractor to use the hollow stem auger as a tremie for emplacement of the well abandonment grout mixture. The auger shall be raised progressively upward as the well is filled with grout in accordance with the Work Plan.

The nonconformances that occurred during well abandonment activities on 29 January 2002 were addressed in a Corrective Action Request (CAR 831471-001) to the Subcontractor. Although the procedures did not conform to the Work Plan or the Subcontract Statement of Work (SOW), the well abandonment procedures complied with Marin County well destruction permit requirements. The Subcontractor has agreed to comply with the conditions of the Work Plan, SOW and this Field Work Variance for all future site activity.

Impact on present and completed work: No impact to cost or schedule.

Requested by: Leonard Mason, Task Geologist

Recommended solution/disposition: *Concur with recommended solution.*

Clarification ☒ Minor Change ☐ Major Change ☐

Signature _____ Date _____
Technical Reviewer

IT Corporation Approvals: *If Major Change:*

Signature _____ Date 2-14-02 Signature _____ Date 2/14/02
Project/Task Manager *Sr. Project Manager*

Signature _____ Date 2-14-02
Project CQCSM

USACE Approval: *If Major Change:*

Approved ☒ Rejected ☐ Signature _____ Date 2/14/02
USACE PM or COR

UDEQ Approval: *If Major Change:*

Approved ☐ Rejected ☐ Signature _____ Date _____
Agency Representative

Final Description _____

Signature _____ Date _____

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February 26, 2002

DCN: ACE13-045-H

Mr. Doug Stanley, Contracting Officer CT-B
U.S. Army Corps of Engineers, Sacramento District
1325 "J" Street, TERC Unit 9th Floor
Sacramento, California 95814

Subject: **Sacramento TERC II – Contract No. DACW05-96-D-0011**
Contract Task Order No. 13, WADs 5 and 6
Hamilton Army Airfield, Novato, CA
Field Work Variance 831471-011

Dear Mr. Stanley:

Enclosed is Field Work Variance (FWV) 831471-011, which proposes minor changes to the volumes of concrete and asphalt to be removed at Revetments 6 and 7, the removal of the jet engine deflector and concrete pad, and the breaking of concrete pieces to a size acceptable to recycling facilities. Should you have any questions regarding this FWV, please contact me at (925) 288-2253.

Sincerely,

Nora M. Okusu
Senior Project Manager

Enclosure

cc:

IT Corp.	USACE	HAAF
V. Taylor	R. Zimny	E. Keller (2 copies)
S. Elkind	C. Fong	
D. Bushnell		
L. Mason		
D. Bero		
M. Reed		
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Field Work Variance No. 831471-011

Page 1 of 2

FIELD WORK VARIANCE

Project Name/Number	Hamilton Army Airfield / 831471	CTO/WADs	13 / 5, 6
Applicable Document	Work Plan for Bldg. 41 Demolition, Spoils Pile F Removal, and Revetments 6 & 7 Removal, Rev. 1 (Dec 2001)	Date	25 Feb 02

Problem Description:

1. Actual quantities of demolition material at Revetment 6 are expected to exceed quantities estimated in the Work Plan.
   - The concrete portion of Revetment 6 is 162 feet in diameter. Assuming an average thickness of 14 inches, the volume of concrete to be removed is 24,116 cubic feet or 893 cubic yards.
   - An asphalt skirt surrounds the concrete at Revetment 6. The asphalt is 29 feet wide and 4 inches thick on the inner edge but much thinner at the outer edge. The volume of asphalt is estimated to be 3,625 cubic feet or 134 cubic yards.
   - Base rock exists under the concrete and has an estimated thickness of 6 inches. The volume of base rock is estimated to be 382 cubic yards.
2. A jet engine exhaust deflector shield is located immediately east of Revetment 6. The deflector shield reduces access to the concrete, asphalt, and contaminated soil at Revetment 6 and is no longer needed by HAAF. Demolition and off-haul of the scrap metal is not discussed in the Work Plan.
3. The Work Plan does not provide guidance for the quality of the concrete rubble to be acceptable for concrete recycling. Procurement of concrete recycling services is dependent on the concrete to be broken into chunks no larger than 2 feet across with any rebar trimmed to 4 inches long. Clarification to the Work Plan guidance is required.

Recommended solution: See Page 2 of 2, Recommended Solution (continued).

Impact on present and completed work: None.

Requested by: Nora Okusu, Project Manager

Recommended solution/disposition: *Concur with recommended solution.*

Clarification ☒ Minor Change ☐ Major Change ☐

Signature [signature] Date 2/26/02
Technical Reviewer

IT Corporation Approvals: *If Major Change:*

Signature _____ Date _____ Signature [signature] Date 2/27/02
Project/Task Manager Sr. Project Manager

Signature [signature] Date 2-25-02
Project COCSM

USACE Approval: *If Major Change:*

Approved ☒ Rejected ☐ Signature [signature] Date 3/05/02
USACE PM or COR

DTSC Approval: *If Major Change:*

Approved ☐ Rejected ☐ Signature _____ Date _____
Agency Representative

Final Description
Signature _____ Date _____

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FIELD WORK VARIANCE CONTINUATION SHEET

Continue FWV discussions below by noting section title(s) to be continued (i.e., Problem Description, Solution/disposition, Final Disposition, etc). Use additional continuation sheets as needed.

Recommended Solution (continued):

1. Perform demolition and off-haul of additional materials in order to meet the intent of the Work Plan guidance.
2. Remove the deflector and concrete pad to allow space to maneuver equipment in accordance with permission granted by the BEC.
3. Clarify the Work Plan guidance for concrete demolition to include that IT will break the concrete from Revetments 6 and 7 into chunks no larger than 2 feet across and trim any rebar to no longer than 4 inches.

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February 28, 2002

DCN: ACE13-047-H

Mr. Doug Stanley, Contracting Officer CT-B
U.S. Army Corps of Engineers, Sacramento District
1325 "J" Street, TERC Unit 9th Floor
Sacramento, California 95814

Subject: **Sacramento TERC II – Contract No. DACW05-96-D-0011**
Contract Task Order No. 13, WADs 5 and 6
Hamilton Army Airfield, Novato, CA
Field Work Variance 831471-012

Dear Mr. Stanley:

Enclosed is Field Work Variance (FWV) 831471-012, which proposes the use of SW-846 Method 8270C-SIM for analysis of PAHs. In addition, minor changes to the QAPP tables are proposed. Should you have any questions regarding this FWV, please contact me at (925) 288-2253.

Sincerely,

Nora M. Okusu
Senior Project Manager

Enclosure

cc:

IT Corp.	USACE	HAAF
V. Taylor	R. Zimny	E. Keller (2 copies)
S. Elkind	C. Fong	
D. Bushnell		
L. Mason		
D. Bero		
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Field Work Variance No. 831471-012

FIELD WORK VARIANCE

Project Name/Number	Hamilton Army Airfield / 831471	CTO/WADs	13 / 5, 6
Applicable Document	Work Plan for Bldg. 41 Demolition, Spoils Pile F Removal, and Revetments 6 & 7 Removal, Rev. 1 (Dec 2001)	Date	26 Feb 02

Problem Description:

1. The Quality Assurance Project Plan did not adequately address the use of EPA Method 8270C-Selected Ion Monitoring (8270C-SIM) as an alternative to EPA Method 8310 for analysis of PAHs and the tables in the QAPP required editorial revisions.
2. Due to matrix interferences, EPA Method 8310 reporting limits were raised above the comparator values in some cases.

Recommended solution: SEE RECOMMENDED SOLUTION (CONTINUED), PAGE 2 OF 2.

Impact on present and completed work: None.

Requested by: Nora Okusu, Project Manager

Recommended solution/disposition: *Concur with recommended solution.*

Clarification ☒ Minor Change ☐ Major Change ☐

Signature Deirdre O'Leary Date Feb 28. 2002.
Technical Reviewer

IT Corporation Approvals: *If Major Change:*

Signature _____ Date _____ Signature _____ Date 2/28/02
Project/Task Manager *Sr. Project Manager*

Signature _____ Date 2-28-02
Project CQCSM

USACE Approval: *If Major Change:*

Approved ☒ Rejected ☐ Signature _____ Date 3/05/02
USACE PM or COR

DTSC Approval: *If Major Change:*

Approved ☐ Rejected ☐ Signature _____ Date _____
Agency Representative

Final Description

Signature _____ Date _____

CC: L. STOUT
N. OKUSU
M. REED
TERC II FILES

FIELD WORK VARIANCE CONTINUATION SHEET

Continue FWV discussions below by noting section title(s) to be continued (i.e., Problem Description, Solution/disposition, Final Disposition, etc). Use additional continuation sheets as needed.

Recommended Solution (continued):

1. Redline/Strikeout versions of the following tables with the indicated changes are provided as an attachment to this FWV:
   - Table 1:
     - Remove reference to Note 1; add 8270C-SIM;
   - Table 2A:
     - Add SW8270C-SIM;
     - Change continuing calibration verification requirements for SW8310, PAHs, to 80-120 percent;
   - Table 2B:
     - Add SW8270C-SIM;
   - Table 3:
     - Add analyte list for SW8270C-SIM;
     - Add comparator value for mercury and for total PCBs;
     - For EPA Method SW846 Chap. 7, correct parameter to read Reactivity.
     - Delete 2-methylnapthalene from the EPA Method 8310 analyte list;
   - Table 4:
     - Add control limits for EPA Method 8270C-SIM
     - Delete 2-methylnapthalene from the EPA Method 8310 analyte list;
   - Table 7A
     - Add SW8270C-SIM to SW8270C method description;
   - Table 7B
     - Add SW8270C-SIM to SW8270C method description;
   - Table 10
     - Correct flagging procedure for continuing calibration verification based on percent difference calculation consistent with EPA Method 8000:

$$\%D=(CCAL\ Response-ICAL\ Response)/ICAL\ Response$$

- Add the following text to Section 2.4.1:

  "If matrix interferences are encountered, alternatives may be used to ensure that comparator values are met. For example, EPA Method 8310 is subject to interference from co-extracted non-target organics. EPA Method 8270C in the selected ion monitoring mode may be less prone to these interferences and may be used as an alternative method for PAH analyses."

2. Sample HBPDL605-SO-142 was analyzed initially by EPA Method 8310. Matrix interferences resulted in a 10-fold dilution that raised the PQLs for some analytes above the comparator value. Subsequent to this, the laboratory was instructed to run all PAHs by SW8270C-SIM. The Summary of Comparator table has been revised and is attached to this FWV for the upcoming work at Revetments 6 and 7.

Attachment: Summary of Comparators for Revetments 6 and 7
FWV 831471-012

AREA	METHOD	#	COMPOUND	COMPARATOR VALUE (MG/KG)	REQUIRED PQL (MG/KG)
Revertment 6	EPA Method 8015B	1	Total Petroleum Hydrocarbons as gasoline	12	1
	EPA Method 8270C-SIM	1	2-Methylnapthalene	0.0194	0.01
		1	Acenapthene	0.026	0.015
		2	Fluorene	0.0253	0.025
Revertment 7	EPA Method 6010B	1	Lead	43.2	1
	EPA Method 8270C-SIM	1	2-Methylnapthalene	0.0194	0.01
		1	Acenapthene	0.026	0.017
		2	Anthracene	0.088	0.025
		3	Benzo(a)anthracene	0.412	0.025
		4	Benzo(a)pyrene	0.43	0.025
		5	Chrysene	0.384	0.025
		6	Dibenz(a,h)anthracene	0.0634	0.025
		7	Fluoranthene	0.6	0.025
		8	Fluorene	0.0253	0.017
		9	Phenanthrene	0.24	0.025
		10	Pyrene	0.665	0.025

Table 1: Sample Container, Preservation, and Holding Time Requirements
Hamilton Army Airfield - Quality Assurance Project Plan

Method Number	Parameters	Matrix	Holding Time (from Date of Sample Collection)	Containers	Preservative	Minimum Sample Size
SW8015B	Gasoline	water	analysis - 7 days (unpreserved)	40 mL VOA vials with Teflon septa	Store at 4 deg C	3 X 40 mL
			analysis - 14 days (preserved)	40 mL VOA vials with Teflon septa	Store at 4 deg C HCL to pH < 2	3 X 40 mL
		soil	analysis - 48 hrs. (unpreserved)	5 g EnCore™	Store at 4 deg C	3 X 5 g
SW8015B	Diesel, Motor Oil Jet Fuel	water	extraction - 7 days analysis - 40 days	1 L amber glass with Teflon liners	Store at 4 deg C	2 X 1.0 L
		soil	extraction - 14 days analysis - 40 days	2" x 6" stainless steel tubes with Teflon liners or 8 oz. glass jars	Store at 4 deg C	500 g
SW8081A	Organochlorine Pesticides	water	extraction - 7 days analysis - 40 days	1 L amber glass with Teflon liners	Store at 4 deg C	2 X 1.0 L
		soil	extraction - 14 days analysis - 40 days	2" x 6" stainless steel tubes with Teflon liners or 8 oz. glass jars	Store at 4 deg C	500 g
SW8260B	Volatile Organic Compounds	water	analysis - 7 days (unpreserved)	40 mL VOA vials with Teflon septa	Store at 4 deg C	3 X 40 mL
			analysis - 14 days (preserved)	40 mL VOA vials with Teflon septa	Store at 4 deg C HCL to pH < 2	3 X 40 mL
		soil	analysis - 48 hrs (unpreserved)	5 g EnCore™	Store at 4 deg C	3 X 5 g
SW8082	PCBs	water	extraction - 7 days analysis - 40 days	1 L amber glass with Teflon liners	Store at 4 deg C ~~Note 1~~	2 X 1.0 L
		soil	extraction - 14 days analysis - 40 days	2" x 6" stainless steel tubes with Teflon liners or 8 oz. glass jars	Store at 4 deg C	500 g

Table 1: Sample Container, Preservation, and Holding Time Requirements
Hamilton Army Airfield - Quality Assurance Project Plan

Method Number	Parameters	Matrix	Holding Time (from Date of Sample Collection)	Containers	Preservative	Minimum Sample Size
SW8270C and SW8270C-SIM	Semivolatile Organic Compounds	water	extraction - 7 days analysis - 40 days	1 L amber glass with Teflon liners	Store at 4 deg C ~~Note 1~~	2 X 1.0 L
		soil	extraction - 14 days analysis - 40 days	2" x 6" stainless steel tubes with Teflon liners or 8 oz. glass jars	Store at 4 deg C	500 g
SW8310	PAHs	water	extraction - 7 days analysis - 40 days	1 L amber glass with Teflon liners	Store at 4 deg C ~~Note 1~~	2 X 1.0 L
		soil	extraction - 14 days analysis - 40 days	2" x 6" stainless steel tubes with Teflon liners or 8 oz. glass jars	Store at 4 deg C	500 g
SW6010B/20	Metals by ICP-AES	water	analysis - 6 months	500 mL plastic	Nitric acid, pH < 2	500 mL
		soil	analysis - 6 months	2" x 6" stainless steel tubes with Teflon liners or 8 oz. glass jars	None	500 g
SW7470A/SW7471A	Mercury by CVAA	water	analysis - 28 days	500 mL plastic	Nitric acid, pH < 2	500 mL
		soil	analysis - 28 days	2" x 6" stainless steel tubes with Teflon liners or 8 oz. glass jars	Store at 4 deg C	500 g
SW1010	Ignitability	soil	analysis - 14 days	2" x 6" stainless steel tubes with Teflon liners 8 oz. glass jars	Store at 4 deg C	100 g
9045B	Corrosivity	soil	analysis - 24 hours	2" x 6" stainless steel tubes with Teflon liners 8 oz. glass jars	Store at 4 deg C	100 g
SW Chap 7	Reactivity Cyanide Reactivity Sulfide	soil	analysis - 14 days	2" x 6" stainless steel tubes with Teflon liners 8 oz. glass jars	Store at 4 deg C dark	100 g

Table 2A: Summary of Laboratory Calibration Procedures
Hamilton Army Airfield - Quality Assurance Project Plan

Method	Parameters	Calibration	Frequency	Method Acceptance Criteria	Corrective Action
SW8015B	Gasoline	Multipoint calibration (minimum of 5 points)	Initially and as required	$r \geq 0.995$ or %RSD $\leq$ 20%	(1) Evaluate system (2) Recalibrate as necessary
		Method blanks and instrument blanks	After initial calibration	No target analytes present above half of the PQL	(1) Reanalyze blank (2) Clean system (3) Reanalyze affected samples
		Continuing calibration verification	Every 10 injections and at beginning and end of sequence	85-115% recovery	(1) Evaluate system (2) Reanalyze standard (3) Recalibrate as necessary (4) Reanalyze affected samples
SW8015B	Diesel, Motor Oil Jet Fuel	Multipoint calibration (minimum of 5 points)	Initially and as required	$r \geq 0.995$ or %RSD $\leq$ 20%	(1) Evaluate system (2) Recalibrate as necessary
		Method blanks and instrument blanks	After initial calibration	No target analytes present above half of the PQL	(1) Reanalyze blank (2) Clean system (3) Reanalyze affected samples
		Continuing calibration verification	Every 10 injections and at beginning and end of sequence	85-115% recovery	(1) Evaluate system (2) Reanalyze standard (3) Recalibrate as necessary (4) Reanalyze affected samples
SW8081A and SW8082	Organochlorine Pesticides and PCBs	Multipoint calibration (minimum of 5 points)	Initially and as required	%RSD $\leq$ 20%	(1) Evaluate system (2) Recalibrate as necessary
		Method blanks and instrument blanks	After initial calibration	No target analytes present above half of the PQL	(1) Reanalyze blank (2) Clean system (3) Reanalyze affected samples
		Continuing calibration verification	Every 10 injections and at beginning and end of sequence	85-115% recovery	(1) Evaluate system (2) Reanalyze standard (3) Recalibrate as necessary (4) Reanalyze affected samples
SW8260B	Volatile Organic Compounds	Check of instrument tuning using BFB	Every 12 hours	Refer to method	(1) Retune instrument (2) Reanalyze BFB
		Multipoint calibration (minimum of 5 points)	Initially and as required	%RSD $\leq$ 15% RF > 0.10 for SPCC	(1) Evaluate system (2) Recalibrate as necessary
		Method blanks and instrument blanks	After initial calibration	No target analytes present above half of the PQL	(1) Reanalyze blank (2) Clean system (3) Reanalyze affected samples
		Continuing calibration verification	Every 12 hours	80-120% recovery for CCC RF > 0.10 for SPCC	(1) Evaluate system (2) Reanalyze standard (3) Recalibrate as necessary (4) Reanalyze affected samples
SW8270C and SW8270C SIM	Semivolatile Organic Compounds	Check of instrument tuning using DFTPP	Every 12 hours	Refer to method	(1) Retune instrument (2) Reanalyze DFTPP
		Multipoint calibration (minimum of 5 points)	Initially and as required	%RSD $\leq$ 15% RF > 0.05 for SPCC	(1) Evaluate system (2) Recalibrate as necessary
		Method blanks and instrument blanks	After initial calibration	No target analytes present above half of the PQL	(1) Reanalyze blank (2) Clean system (3) Reanalyze affected samples
		Continuing calibration verification	Every 12 hours	80-120% recovery for CCC RF > 0.05 for SPCC	(1) Evaluate system (2) Reanalyze standard (3) Recalibrate as necessary (4) Reanalyze affected samples
SW8310	PAHs	Multipoint calibration (minimum of 5 points)	Initially and as required	%RSD $\leq$ 20%	(1) Evaluate system (2) Recalibrate as necessary
		Method blanks and instrument blanks	After initial calibration	No target analytes present above half of the PQL	(1) Reanalyze blank (2) Clean system (3) Reanalyze affected samples
		Continuing calibration verification	Every 10 injections and at beginning and end of sequence	~~85-115~~ 80-120% recovery	(1) Evaluate system (2) Reanalyze standard (3) Recalibrate as necessary (4) Reanalyze affected samples

Table 2A: Summary of Laboratory Calibration Procedures
Hamilton Army Airfield - Quality Assurance Project Plan

Method	Parameters	Calibration	Frequency	Method Acceptance Criteria	Corrective Action
SW6010B	Metals by ICP-AES/ ICP-MS	Single or multi-point calibration	Daily, prior to analyses	$r \geq 0.995$	(1) Evaluate system (2) Recalibrate as necessary
		Calibration blank	After initial calibration	No metals present above half of the PQL	(1) Reanalyze blank (2) Clean system (3) Reanalyze affected samples
		ICP interference check sample (ICS)	Beginning and end of run, and after 8 hours	80-120% recovery for elements in the ICS; target analytes not in the ICS not present above half of the PQL	(1) Recalibrate if appropriate (2) See inorganic supervisor
		Initial calibration verification (ICV) and continuing calibration verification (CCV)	After calibration, every ten samples, and at end of run	90-110% recovery	(1) Evaluate system (2) Reanalyze ICV or CCV (3) Recalibrate if appropriate (4) Reanalyze affected samples
SW7470A/SW7471A	Mercury by CVAA	Multipoint calibration (minimum 4 points)	Daily, prior to analyses	$r \geq 0.995$	(1) Evaluate system (2) Recalibrate as necessary
		Calibration blank	After initial calibration	No mercury present above half of the PQL	(1) Reanalyze blank (2) Clean system (3) Reanalyze affected samples
		Initial calibration verification (ICV) and continuing calibration verification (CCV)	After calibration, every ten samples, and at end of run	80-120% recovery	(1) Evaluate system (2) Reanalyze ICV or CCV (3) Recalibrate if appropriate (4) Reanalyze affected samples

NA = Not applicable.
RSD = Relative standard deviation of response factors.
RF = Response factor
SPCCs = System performance check compounds.
DFTPP = Decafluorotriphenylphosphine.
PFK = Perfluorokerosene.

ICP = Inductively coupled plasma.
BFB = Bromofluorobenzene
CVAA = Cold Vapor Atomic Absorption

Table 2B: Summary of Laboratory QC Sample Requirements
Hamilton Army Airfield - Quality Assurance Project Plan

Method Number	Parameters	Method Blanks	Matrix Duplicate	Laboratory Control Sample	Matrix Spike/ Matrix Spike Duplicate	Surrogate Spikes
SW8015B	Gasoline	1 per analytical batch	NA	1 per analytical batch	1 per analytical batch	All samples
SW8015B	Diesel, Motor Oil	1 per preparation batch	NA	1 per preparation batch	1 per analytical batch	All samples
SW8081A	Organochlorine Pesticides	1 per preparation batch	NA	1 per preparation batch	1 per analytical batch	All samples
SW8082	PCBs	1 per preparation batch	NA	1 per preparation batch	1 per analytical batch	All samples
SW8260B	Volatile Organic Compounds	1 per analytical batch	NA	1 per analytical batch	1 per analytical batch	All samples
SW8270C and SW8270C SIM	Semivolatile Organic Compounds	1 per preparation batch	NA	1 per preparation batch	1 per analytical batch	All samples
SW8310	PAHs	1 per preparation batch	NA	1 per preparation batch	1 per analytical batch	All samples
SW6010B	Metals by ICP-AES	1 per preparation batch	1 per analytical batch	1 per preparation batch	1 per analytical batch	NA
SW7470A/SW7471A	Mercury by CVAA	1 per preparation batch	1 per analytical batch	1 per preparation batch	1 per analytical batch	NA

NA = Not applicable

Table 3: Analytical Methods, Parameters, and Practical Quantitation Limits
Hamilton Army Airfield - Quality Assurance Project Plan

Parameter	Method and Analytes	Control Compounds	Comparator Value µg/kg	Matrix Units CAS Number	PQL Water µg/L	PQL Soil µg/kg
Purgeable Petroleum Hydrocarbons	**EPA Method SW8015B**					
	Gasoline (C_6-C_{12})	X	12,000	8006-61-9	50	1,000
	Surrogate					
	4-Bromofluorobenzene			NA	NA	NA
Extractable Petroleum Hydrocarbons	**EPA Method SW8015B**					
	Diesel (C_{10}-C_{24})	X	144,000		50	1,000
	Motor Oil (C_{24}-C_{36})				50	1,000
	Surrogate					
	n-octacosane			NA	NA	NA
Organochlorine Pesticides	**EPA Method SW8081A**					
	Aldrin			309-00-2	0.05	2
	alpha-BHC			319-84-6	0.05	2
	beta-BHC			319-85-7	0.05	2
	gamma-BHC (Lindane)			58-89-9	0.05	2
	delta-BHC			319-86-8	0.05	2
	alpha-Chlordane			5103-71-9	0.05	2
	gamma-Chlordane			12789-03-6	0.05	2
	4,4'-DDD	X	7	72-54-8	0.10	4
	4,4'-DDE	X	7	72-55-9	0.10	4
	4,4'-DDT	X	7	50-29-3	0.10	4
	Dieldrin			60-57-1	0.10	4
	Endosulfan I			959-98-8	0.05	2
	Endosulfan II			33213-65-9	0.10	4
	Endosulfan sulfate			1031-07-8	0.10	4
	Endrin			72-20-8	0.10	4
	Endrin aldehyde			7421-93-4	0.10	4
	Endrin ketone			53494-70-5	0.10	4
	Heptachlor			76-44-8	0.05	2
	Heptachlor epoxide			1024-57-3	0.05	2
	Methoxychlor			72-43-5	0.5	20
	Toxaphene			8001-35-2	3	5
	Surrogates					
	Decachlorobiphenyl			NA	NA	NA
	Tetrachloro-m-xylene			NA	NA	NA
Volatile Organic Compounds	**EPA Method SW8260B**					
	Acetone			67-64-1	10	50
	Benzene	X		71-43-2	0.5	5
	Bromobenzene			108-86-1	1	5
	Bromochloromethane			74-97-5	1	5
	Bromodichloromethane			75-27-4	0.5	5
	Bromoform			75-25-2	0.5	5
	Bromomethane			74-83-9	0.5	5
	2-Butanone			78-93-3	20	50
	n-Butylbenzene			104-51-8	1	5
	sec-Butylbenzene			135-98-8	1	5
	tert-Butylbenzene			98-06-6	1	5
	Carbon disulfide			75-15-0	1	10
	Carbon tetrachloride			56-23-5	0.5	5
	Chlorobenzene			108-90-7	0.5	5
	Chloroethane			75-00-3	0.5	5
	2-Chloroethyl vinyl ether			110-75-8	20	20
	Chloroform			67-66-3	0.5	5
	Chloromethane			74-87-3	1	5
	2-Chlorotoluene			95-49-8	1	5
	4-Chlorotoluene			106-43-4	1	5
	Dibromochloromethane			124-48-1	0.5	5
	1,2-Dibromo-3-chloropropane			96-12-8	1	10
	1,2-Dibromoethane			106-93-4	1	5
	Dibromomethane			74-95-3	1	5
	1,2-Dichlorobenzene			95-50-1	1	5
	1,3-Dichlorobenzene			541-73-1	1	5
	1,4-Dichlorobenzene			106-46-7	1	5
	Dichlorodifluoromethane			75-71-8	1	5
	1,1-Dichloroethane			75-34-3	0.5	5
	1,2-Dichloroethane			107-06-2	0.5	5

Table 3: Analytical Methods, Parameters, and Practical Quantitation Limits
Hamilton Army Airfield - Quality Assurance Project Plan

Parameter	Method and Analytes	Control Compounds	Comparator Value µg/kg	Matrix Units CAS Number	PQL Water µg/L	PQL Soil µg/kg
	1,1-Dichloroethene	X		75-35-4	0.5	5
	cis-1,2-Dichloroethene			156-59-2	0.5	5
	trans-1,2-Dichloroethene			156-60-5	0.5	5
	1,2-Dichloropropane			78-87-5	0.5	5
	1,3-Dichloropropane			142-28-9	1	5
	2,2-Dichloropropane			594-20-7	1	5
	1,1-Dichloropropene			563-58-6	1	5
	cis-1,3-Dichloropropene			10061-01-5	0.5	5
	trans-1,3-Dichloropropene			10061-02-6	0.5	5
	Ethylbenzene	X		100-41-4	0.5	5
	Hexachlorobutadiene			87-68-3	1	5
	2-Hexanone			591-78-6	5	10
	Isopropylbenzene			98-82-8	1	5
	p-Isopropyltoluene			99-87-6	1	5
	Methyl tert-butyl ether			1634-04-4	1	5
	Methylene chloride			75-09-2	5	10
	4-Methyl-2-pentanone			108-10-1	20	10
	n-Propylbenzene			103-65-1	1	5
	Styrene			100-42-5	0.5	5
	1,1,1,2-Tetrachloroethane			630-20-6	1	5
	1,1,2,2-Tetrachloroethane	X		79-34-5	0.5	5
	Tetrachloroethene	X		127-18-4	1	5
	Toluene	X		108-88-3	0.5	5
	1,2,3-Trichlorobenzene			87-61-6	1	5
	1,2,4-Trichlorobenzene			120-82-1	1	5
	1,1,1-Trichloroethane			71-55-6	0.5	5
	1,1,2-Trichloroethane			79-00-5	0.5	5
	Trichloroethene	X		79-01-6	0.5	5
	Trichlorofluoromethane			75-69-4	1	5
	1,2,3-Trichloropropane			96-18-4	1	5
	1,1,2-Trichloro-1,2,2-trifluoroethane			76-13-1	1	5
	1,2,4-Trimethylbenzene			95-63-6	1	5
	1,3,5-Trimethylbenzene			108-67-8	1	5
	Vinyl acetate			108-05-4	5	5
	Vinyl chloride			75-01-4	0.5	5
	m,p-Xylene	X		1330-20-7	0.5	5
	o-Xylene	X		95-47-6	0.5	5
	Surrogate					
	4-Bromofluorobenzene			NA	NA	NA
	Dibromofluoromethane			NA	NA	NA
	1,2-Dichloroethane-d4			NA	NA	NA
	Toluene-d8			NA	NA	NA
Semivolatile Organic Compounds	**EPA Method SW8270C**					
	Acenaphthene	X	26	83-32-9	10	
	Acenaphthylene			208-96-8	10	330
	Anthracene	X	88	120-12-7	10	
	Benzoic acid			65-85-0	10	330
	Benzo[a]anthracene	X	412	56-55-3	10	330
	Benzo[b]fluoranthene	X	371	205-99-2	10	150
	Benzo[k]fluoranthene			207-08-9	10	330
	Benzo[g,h,i]perylene	X	310	191-24-2	10	150
	Benzo[a]pyrene	X	430	50-32-8	10	150
	Benzyl alcohol			100-51-6	50	330
	Bis(2-chloroethoxy)methane			111-91-1	10	330
	Bis(2-chloroethyl)ether			111-44-4	10	330
	Bis(2-chloroisopropyl)ether			108-60-1	10	330
	Bis(2-ethylhexyl)phthalate			117-81-7	10	330
	4-Bromophenyl phenyl ether			101-55-3	10	330
	Butylbenzylphthalate			85-68-7	10	330
	Carbazole			86-74-8	10	330
	4-Chloroaniline			106-47-8	10	330
	4-Chloro-3-methylphenol			35421-08-0	10	330
	2-Chloronaphthalene			91-58-7	10	330
	2-Chlorophenol			95-57-8	10	330
	4-Chlorophenyl phenyl ether			7005-72-3	10	330
	Chrysene	X	384	218-01-9	10	150
	Dibenzo(a,h)anthracene	X	63.4	53-70-3	10	
	3,3'-Dichlorobenzidine			91-94-1	20	330

Table 3: Analytical Methods, Parameters, and Practical Quantitation Limits
Hamilton Army Airfield - Quality Assurance Project Plan

Parameter	Method and Analytes	Control Compounds	Comparator Value µg/kg	Matrix Units CAS Number	PQL Water µg/L	PQL Soil µg/kg
	Dibenzofuran	X	110	132-64-9	10	100
	1,2-Dichlorobenzene			95-50-1	10	330
	1,3-Dichlorobenzene			541-73-1	10	330
	1,4-Dichlorobenzene			106-46-7	10	330
	2,4-Dichlorophenol			120-83-2	10	330
	Diethylphthalate			84-66-2	10	330
	2,4-Dimethylphenol			105-67-9	10	330
	2,6-Dimethylphenol			576-26-1	10	330
	3,4-Dimethylphenol			95-65-8	10	330
	Dimethyl phthalate			131-11-3	10	330
	Di-n-butylphthalate			84-74-3	10	330
	4,6-Dinitro-2-methylphenol			534-52-1	50	1,660
	2,4-Dinitrophenol			51-28-5	50	1,660
	2,4-Dinitrotoluene			121-14-2	10	330
	2,6-Dinitrotoluene			606-20-2	10	330
	Di-n-octyl phthalate			117-84-0	10	330
	Fluoroanthene	X	600	206-44-0	10	330
	Fluorene	X	25.3	86-73-7	10	
	Hexachlorobenzene			118-74-1	10	330
	Hexachlorobutadiene			87-68-3	10	330
	Hexachlorocyclopentadiene			77-47-4	50	1,660
	Hexachloroethane			67-72-1	10	330
	Indeno(1,2,3-cd)pyrene	X	160	193-39-5	10	330
	Isophorone			78-59-1	10	330
	2-Methylnaphthalene	X	19.4	91-57-6	10	330
	2-Methylphenol			95-48-7	10	330
	3-Methylphenol			108-39-4	10	330
	4-Methylphenol			106-44-5	10	330
	Naphthalene	X	382	91-20-3	10	330
	2-Nitroaniline			88-74-4	10	330
	3-Nitroaniline			99-09-2	10	330
	4-Nitroaniline			100-01-6	10	330
	Nitrobenzene			98-95-3	10	330
	2-Nitrophenol			88-75-5	10	660
	4-Nitrophenol			100-02-7	10	330
	Pentachlorobenzene			608-93-5	50	1,660
	Pentachloronitrobenzene			82-68-8	50	1,660
	Pentachlorophenol			87-86-5	50	1,660
	Phenanthrene	X	240	85-01-8	10	150
	Phenol			108-95-2	10	330
	Pyrene	X	665	129-00-0	10	330
	Pyridine			110-86-1	20	660
	1,2,4,5-Tetrachlorobenzene			95-94-3	10	330
	2,3,4,6-Tetrachlorophenol			58-90-2	10	330
	1,2,4-Trichlorobenzene			120-82-1	10	330
	2,4,5-Trichlorophenol			95-95-4	10	330
	2,4,6-Trichlorophenol			88-06-2	10	330
	Surrogates					
	2,4,6-Tribromophenol			NA	NA	NA
	2-Fluorobiphenyl			NA	NA	NA
	2-Fluorophenol			NA	NA	NA
	Nitrobenzene-d5			NA	NA	NA
	Phenol-d6			NA	NA	NA
	Terphenyl-d14			NA	NA	NA
Semivolatile Organic Compounds	**EPA Method SW8270C SIM**					
	Acenaphthene	X	26	83-32-9	1	17
	Acenaphthylene			208-96-8	1	25
	Anthracene	X	88	120-12-7	1	25
	Benzo[a]anthracene	X	412	56-55-3	1	25
	Benzo[b]fluoranthene			205-99-2	1	25
	Benzo[k]fluoranthene			207-08-9	1	25
	Benzo[a]pyrene	X	430	50-32-8	1	25
	Benzo[g,h,i]perylene	X	310	191-24-2	1	25
	Chrysene	X	384	218-01-9	1	25
	Dibenzo(a,h)anthracene	X	63.4	117-81-7	1	25
	Fluoranthrene	X	600	206-44-0	1	25
	Fluorene	X	25.3	86-73-7	1	17
	Indeno(1,2,3-cd)pyrene	X	160	193-39-5	1	25

Table 3: Analytical Methods, Parameters, and Practical Quantitation Limits
Hamilton Army Airfield - Quality Assurance Project Plan

Parameter	Method and Analytes	Control Compounds	Comparator Value µg/kg	Matrix Units CAS Number	PQL Water µg/L	PQL Soil µg/kg
	Naphthalene	X	382	91-20-3	1	25
	Phenanthrene	X	240	85-01-8	1	25
	Pyrene	X	66.5	129-00-0	1	25
	2-methyl naphthalene	X	19.4	91-57-6	0.5	10
	Surrogate					
	p-terphenyl			NA	1	25
PAHs	**EPA Method SW8310**					
	Acenaphthene	X	26	83-32-9	5	15
	Acenaphthylene			208-96-8	5	50
	Anthracene	X	88	120-12-7	1	10
	Benzo[a]anthracene	X	412	56-55-3	0.5	5
	Benzo[b]fluoranthene	X	371	205-99-2	0.5	5
	Benzo[k]fluoranthene			207-08-9	0.5	5
	Benzo[a]pyrene	X	430	50-32-8	0.2	2
	Benzo[g,h,i]perylene	X	310	191-24-2	0.5	5
	Chrysene	X	384	218-01-9	0.5	5
	Dibenzo(a,h)anthracene	X	63.4	117-81-7	0.5	5
	Fluoranthrene	X	600	206-44-0	0.5	5
	Fluorene	X	25.3	86-73-7	0.5	5
	Indeno(1,2,3-cd)pyrene	X	160	193-39-5	0.5	5
	Naphthalene	X	382	91-20-3	5	50
	Phenanthrene	X	240	85-01-8	1	10
	Pyrene	X	66.5	129-00-0	0.5	5
	~~2 Methylnaphthalene~~	~~X~~	~~19.4~~	~~91-57-6~~	~~0.5~~	~~10~~
	Surrogates					
	p-terphenyl			NA	NA	NA
Metals by ICP-AES	**EPA Method SW6010B**					
	Aluminum			7429-90-5	200	5,000
	Antimony			7440-36-0	6	5,000
	Arsenic	X	16,700	7440-38-2	10	250
	Barium			7440-39-3	5	1,000
	Beryllium	X	1,000	7440-41-7	4	500
	Cadmium	X	1,200	7440-43-9	5	300
	Calcium			7440-70-2	200	20,000
	Chromium			7440-47-3	10	1,000
	Cobalt	X	27,600	7440-48-4	4	1,000
	Copper			7440-50-8	10	1,000
	Iron			7439-89-6	100	5,000
	Lead	X	43,200	7439-92-1	10	1,000
	Magnesium			7439-95-4	200	20,000
	Manganese	X	943,000	7439-96-5	5	1,000
	Molybdenum			7439-98-7	10	1,000
	Nickel	X	113,000	7440-02-0	20	2,000
	Potassium			7440-09-7	2,000	20,000
	Selenium			7782-49-2	10	1,000
	Silver			7440-22-4	5	1,000
	Sodium			7440-23-5	2,000	100,000
	Thallium			1314-32-5	5	1,000
	Titanium			7440-32-6	10	1,000
	Vanadium			7440-62-2	5	1,000
	Zinc	X	158,000	7440-66-6	10	1,000
Metals by CVAA	**EPA Method SW7470A/SW7471A**	X				
	Mercury		430	7439-97-6	0.1	100
PCBs	**EPA Method by 8082**					
	Aroclor 1016	X	360 (total PCBs)	12674-11-2	0.5	100
	Aroclor 1221			11104-28-2	1	100
	Aroclor 1232			11141-16-5	0.5	100
	Aroclor 1242			53469-21-9	0.5	100
	Aroclor 1248			12672-29-6	0.5	100
	Aroclor 1254			27323-18-8	0.5	50
	Aroclor 1260	X		11096-82-5	0.5	50
~~M~~**Reactivity**	**EPA Method SW846 Chap 7**					
	Reactive Cyanide	X			10	2,500
	Reactive Sulfide	X			2,000	4,000

Note:
NA = Not Applicable

Table 4: Laboratory Precision and Accuracy Goals
Hamilton Army Airfield - Quality Assurance Project Plan

Method and Parameters	Control Compounds	Laboratory Control Sample & Surrogates*				Matrix Spike (MS)/MS Duplicate				Lab Duplicate				Field Duplicate	
		Lab Control Limit		Rejection Criteria		Lab Control Limit		Rejection Criteria		Lab Control Limit		Advisory Limit**		Advisory Limit**	
		Water %	Soil %	Water %	Soil %	Water %	Soil %	Water %	Soil %	Water RPD	Soil RPD	Water RPD	Soil RPD	Water RPD	Soil RPD
Purgeable Petroleum Hydrocarbons															
EPA Method SW8015B															
Gasoline (C_6-C_{12})	X	65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
Surrogate															
4-Bromofluorobenzene		65-135	65-135	< 30	< 30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Extractable Petroleum Hydrocarbons															
EPA Method SW8015B															
Diesel (C_{10}-C_{24})	X	65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
Motor Oil (C_{24}-C_{36})		65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
Surrogate															
n-octacosane		65-135	65-135	< 30	< 30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs															
EPA Method by 8082															
Aroclor 1016	X	65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
Aroclor 1221		65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
Aroclor 1232		65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
Aroclor 1242		65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
Aroclor 1248		65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
Aroclor 1254		65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
Aroclor 1260	X	65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
Surrogates															
Decachlorobiphenyl		65-135	65-135	< 30	< 30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloro-m-xylene		65-135	65-135	< 30	< 30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organochlorine Pesticides															
EPA Method SW8081A															
Aldrin		65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
alpha-BHC		65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
beta-BHC		65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
gamma-BHC (Lindane)		65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
delta-BHC		65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
alpha-Chlordane		65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
gamma-Chlordane		65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
4,4'-DDD	X	65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
4,4'-DDE	X	65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
4,4'-DDT	X	65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
Dieldrin		65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50

Table 4: Laboratory Precision and Accuracy Goals
Hamilton Army Airfield - Quality Assurance Project Plan

Method and Parameters	Control Compounds	Laboratory Control Sample & Surrogates*				Matrix Spike (MS)/MS Duplicate				Lab Duplicate				Field Duplicate	
		Lab Control Limit		Rejection Criteria		Lab Control Limit		Rejection Criteria		Lab Control Limit		Advisory Limit**		Advisory Limit**	
		Water %	Soil %	Water %	Soil %	Water %	Soil %	Water %	Soil %	Water RPD	Soil RPD	Water RPD	Soil RPD	Water RPD	Soil RPD
Endosulfan I		65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
Endosulfan II		65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
Endosulfan sulfate		65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
Endrin		65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
Endrin aldehyde		45-140	45-140	< 30	< 30	45-140	45-140	< 30	< 30	20	40	35	50	35	50
Endrin ketone		65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
Heptachlor		65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
Heptachlor epoxide		65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
Methoxychlor		65-135	65-135	< 30	< 30	65-135	65-135	< 30	< 30	20	40	35	50	35	50
Toxaphene		45-140	45-140	< 30	< 30	45-140	45-140	< 30	< 30	20	40	35	50	35	50
Surrogates															
Decachlorobiphenyl		65-135	65-135	< 30	< 30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloro-m-xylene		65-135	65-135	< 30	< 30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Volatile Organic Compounds															
EPA Method SW8260B															
Acetone		60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Benzene	X	80-120	75-125	< 30	< 30	70-130	70-130	<30	<30	20	40	35	50	35	50
Bromobenzene		80-120	75-125	< 30	< 30	70-130	70-130	<30	<30	20	40	35	50	35	50
Bromochloromethane		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
Bromodichloromethane		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
Bromoform		70-130	65-135	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Bromomethane		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
2-Butanone		60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
n-Butylbenzene		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
sec-Butylbenzene		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
tert-Butylbenzene		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
Carbon disulfide		70-130	65-135	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Carbon tetrachloride		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
Chlorobenzene		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
Chloroethane		70-130	65-135	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
2-Chloroethyl vinyl ether		70-130	65-135	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Chloroform		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
Chloromethane		70-130	65-135	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
2-Chlorotoluene		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
4-Chlorotoluene		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
Dibromochloromethane		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
1,2-Dibromo-3-chloropropane		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
1,2-Dibromoethane		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50

Table 4: Laboratory Precision and Accuracy Goals
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Method and Parameters	Control Compounds	Laboratory Control Sample & Surrogates*				Matrix Spike (MS)/MS Duplicate				Lab Duplicate				Field Duplicate	
		Lab Control Limit		Rejection Criteria		Lab Control Limit		Rejection Criteria		Lab Control Limit		Advisory Limit**		Advisory Limit**	
		Water %	Soil %	Water %	Soil %	Water %	Soil %	Water %	Soil %	Water RPD	Soil RPD	Water RPD	Soil RPD	Water RPD	Soil RPD
Dibromomethane		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
1,2-Dichlorobenzene		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
1,3-Dichlorobenzene		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
1,4-Dichlorobenzene		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
Dichlorodifluoromethane		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
1,1-Dichloroethane		70-130	65-135	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
1,2-Dichloroethane		70-130	65-135	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
1,1-Dichloroethene	X	80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
cis-1,2-Dichloroethene		70-130	65-135	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
trans-1,2-Dichloroethene		70-130	65-135	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
1,2-Dichloropropane		70-130	65-135	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
1,3-Dichloropropane		70-130	65-135	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
2,2-Dichloropropane		70-130	65-135	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
1,1-Dichloropropene		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
cis-1,3-Dichloropropene		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
trans-1,3-Dichloropropene		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
Ethylbenzene	X	80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
Hexachlorobutadiene		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
2-Hexanone		60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Isopropylbenzene		70-130	65-135	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
p-Isopropyltoluene		70-130	65-135	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Methyl tert-butyl ether		70-130	65-135	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Methylene chloride		70-130	65-135	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
4-Methyl-2-pentanone		70-130	65-135	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
n-Propylbenzene		70-130	65-135	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Styrene		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
1,1,1,2-Tetrachloroethane		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
1,1,2,2-Tetrachloroethane	X	80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
Tetrachloroethene	X	80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
Toluene	X	80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
1,2,3-Trichlorobenzene		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
1,2,4-Trichlorobenzene		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
1,1,1-Trichloroethane		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
1,1,2-Trichloroethane		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
Trichloroethene	X	80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
Trichlorofluoromethane		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
1,2,3-Trichloropropane		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
1,1,2-Trichloro-1,2,2-trifluoroethane		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
1,2,4-Trimethylbenzene		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50

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Method and Parameters		Laboratory Control Sample & Surrogates*				Matrix Spike (MS)/MS Duplicate				Lab Duplicate				Field Duplicate	
		Lab Control Limit		Rejection Criteria		Lab Control Limit		Rejection Criteria		Lab Control Limit		Advisory Limit**		Advisory Limit**	
	Control Compounds	Water %	Soil %	Water %	Soil %	Water %	Soil %	Water %	Soil %	Water RPD	Soil RPD	Water RPD	Soil RPD	Water RPD	Soil RPD
1,3,5-Trimethylbenzene		80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
Vinyl acetate		60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Vinyl chloride		70-130	65-135	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
m,p-Xylene	X	80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
o-Xylene	X	80-120	75-125	< 30	< 30	80-120	75-125	<30	<30	20	40	35	50	35	50
Surrogate															
4-Bromofluorobenzene		70-130	70-130	< 30	< 30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromofluoromethane		70-130	70-130	< 30	< 30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane-d4		70-130	70-130	< 30	< 30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene-d8		70-130	70-130	< 30	< 30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds															
EPA Method SW8270C															
Acenaphthene	X	60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Acenaphthylene		60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Anthracene	X	60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Benzoic acid		45-140	45-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Benzo[a]anthracene	X	60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Benzo[b]fluoranthene	X	60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Benzo[k]fluoranthene		60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Benzo[g,h,i]perylene	X	60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Benzo[a]pyrene	X	60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Benzyl alcohol		45-140	45-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Bis(2-chloroethoxy)methane		60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Bis(2-chloroethyl)ether		60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Bis(2-chloroisopropyl)ether		60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Bis(2-ethylhexyl)phthalate		60-140	60-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
4-Bromophenyl phenyl ether		60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Butylbenzylphthalate		60-140	60-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Carbazole		45-140	45-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
4-Chloroaniline		45-140	45-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
4-Chloro-3-methylphenol		60-140	60-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
2-Chloronaphthalene		60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
2-Chlorophenol		60-140	60-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
4-Chlorophenyl phenyl ether		60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Chrysene	X	60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Dibenzo(a,h)anthracene	X	60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
3,3'-Dichlorobenzidine		45-140	45-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Dibenzofuran	X	60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50

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		Lab Control Limit		Rejection Criteria		Lab Control Limit		Rejection Criteria		Lab Control Limit		Advisory Limit**		Advisory Limit**	
		Water %	Soil %	Water %	Soil %	Water %	Soil %	Water %	Soil %	Water RPD	Soil RPD	Water RPD	Soil RPD	Water RPD	Soil RPD
1,2-Dichlorobenzene		60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
1,3-Dichlorobenzene		60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
1,4-Dichlorobenzene		60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
2,4-Dichlorophenol		60-140	60-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Diethylphthalate		60-140	60-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
2,4-Dimethylphenol		60-140	60-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
2,6-Dimethylphenol		60-140	60-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
3,4-Dimethylphenol		60-140	60-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Dimethyl phthalate		60-140	60-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Di-n-butylphthalate		60-140	60-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
4,6-Dinitro-2-methylphenol		60-140	60-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
2,4-Dinitrophenol		60-140	60-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
2,4-Dinitrotoluene		45-140	45-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
2,6-Dinitrotoluene		45-140	45-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Di-n-octyl phthalate		60-140	60-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Fluoroanthene	X	60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Fluorene	X	60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Hexachlorobenzene		60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Hexachlorobutadiene		45-140	45-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Hexachlorocyclopentadiene		45-140	45-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Hexachloroethane		60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Indeno(1,2,3-cd)pyrene	X	60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Isophorone		60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
2-Methylnaphthalene	X	60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
2-Methylphenol		60-140	60-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
3-Methylphenol		60-140	60-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
4-Methylphenol		60-140	60-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Naphthalene	X	60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
2-Nitroaniline		45-140	45-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
3-Nitroaniline		45-140	45-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
4-Nitroaniline		45-140	45-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Nitrobenzene		60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
2-Nitrophenol		60-140	60-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
4-Nitrophenol		45-140	45-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
N-Nitroso-di-n-butylamine		45-140	45-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
N-Nitrosodiethanolamine		45-140	45-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
N-Nitrosodiethylamine		45-140	45-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
N-Nitrosodimethylamine		45-140	45-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
N-Nitrosodiphenylamine		45-140	45-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50

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		Lab Control Limit		Rejection Criteria		Lab Control Limit		Rejection Criteria		Lab Control Limit		Advisory Limit**		Advisory Limit**	
		Water %	Soil %	Water %	Soil %	Water %	Soil %	Water %	Soil %	Water RPD	Soil RPD	Water RPD	Soil RPD	Water RPD	Soil RPD
N-Nitroso-di-n-propylamine		45-140	45-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
N-Nitrosomethylethylamine		45-140	45-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
N-Nitrosopyrrolidine		45-140	45-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Pentachlorobenzene		45-140	45-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Pentachloronitrobenzene		45-140	45-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Pentachlorophenol		45-140	45-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Phenanthrene	X	60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Phenol		60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Pyrene	X	60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Pyridine		45-140	45-140	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
1,2,4,5-Tetrachlorobenzene		60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
2,3,4,6-Tetrachlorophenol		60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
1,2,4-Trichlorobenzene		60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
2,4,5-Trichlorophenol		60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
2,4,6-Trichlorophenol		60-140	60-140	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Surrogates															
2,4,6-Tribromophenol		30-150	45-135	< 30	< 30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Fluorobiphenyl		60-120	45-135	< 30	< 30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Fluorophenol		30-150	45-135	< 30	< 30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene-d5		60-120	45-135	< 30	< 30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol-d6		30-150	45-135	< 30	< 30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Terphenyl-d14		60-120	45-135	< 30	< 30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds															
EPA Method SW8270C SIM															
Acenaphthene	X	65-135	65-135	≤ 30	≤ 30	45-140	45-140	≤30	≤30	20	40	35	50	35	50
Acenaphthylene		65-135	65-135	≤ 30	≤ 30	45-140	45-140	≤30	≤30	20	40	35	50	35	50
Anthracene	X	65-135	65-135	≤ 30	≤ 30	45-140	45-140	≤30	≤30	20	40	35	50	35	50
Benzo[a]anthracene	X	65-135	65-135	≤ 30	≤ 30	45-140	45-140	≤30	≤30	20	40	35	50	35	50
Benzo[b]fluoranthene	X	65-135	65-135	≤ 30	≤ 30	45-140	45-140	≤30	≤30	20	40	35	50	35	50
Benzo[k]fluoranthene		65-135	65-135	≤ 30	≤ 30	45-140	45-140	≤30	≤30	20	40	35	50	35	50
Benzo[a]pyrene	X	65-135	65-135	≤ 30	≤ 30	45-140	45-140	≤30	≤30	20	40	35	50	35	50
Benzo[g,h,i]perylene	X	65-135	65-135	≤ 30	≤ 30	45-140	45-140	≤30	≤30	20	40	35	50	35	50
Chrysene	X	65-135	65-135	≤ 30	≤ 30	45-140	45-140	≤30	≤30	20	40	35	50	35	50
Dibenzo(a,h)anthracene	X	65-135	65-135	≤ 30	≤ 30	45-140	45-140	≤30	≤30	20	40	35	50	35	50
Fluoranthrene	X	65-135	65-135	≤ 30	≤ 30	45-140	45-140	≤30	≤30	20	40	35	50	35	50
Fluorene	X	65-135	65-135	≤ 30	≤ 30	45-140	45-140	≤30	≤30	20	40	35	50	35	50
Indeno(1,2,3-cd)pyrene	X	65-135	65-135	≤ 30	≤ 30	45-140	45-140	≤30	≤30	20	40	35	50	35	50
Naphthalene	X	65-135	65-135	≤ 30	≤ 30	45-140	45-140	≤30	≤30	20	40	35	50	35	50

Table 4: Laboratory Precision and Accuracy Goals
Hamilton Army Airfield - Quality Assurance Project Plan

Method and Parameters	Control Compounds	Laboratory Control Sample & Surrogates*				Matrix Spike (MS)/MS Duplicate				Lab Duplicate				Field Duplicate	
		Lab Control Limit		Rejection Criteria		Lab Control Limit		Rejection Criteria		Lab Control Limit		Advisory Limit**		Advisory Limit**	
		Water %	Soil %	Water %	Soil %	Water %	Soil %	Water %	Soil %	Water RPD	Soil RPD	Water RPD	Soil RPD	Water RPD	Soil RPD
Phenanthrene	X	65-135	65-135	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Pyrene	X	65-135	65-135	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
2-Methylnapthalene	X	65-135	65-135	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Surrogate															
p-terphenyl		65-135	65-135	< 30	< 30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Polynuclear Aromatic Hydrocarbons (PAHs)															
EPA Method SW8310															
Acenaphthene	X	65-135	65-135	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Acenaphthylene		65-135	65-135	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Anthracene	X	65-135	65-135	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Benzo[a]anthracene	X	65-135	65-135	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Benzo[b]fluoranthene	X	65-135	65-135	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Benzo[k]fluoranthene		65-135	65-135	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Benzo[a]pyrene	X	65-135	65-135	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Benzo[g,h,i]perylene	X	65-135	65-135	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Chrysene	X	65-135	65-135	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Dibenzo(a,h)anthracene	X	65-135	65-135	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Fluoranthrene	X	65-135	65-135	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Fluorene	X	65-135	65-135	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Indeno(1,2,3-cd)pyrene	X	65-135	65-135	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Naphthalene	X	65-135	65-135	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Phenanthrene	X	65-135	65-135	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
Pyrene	X	65-135	65-135	< 30	< 30	45-140	45-140	<30	<30	20	40	35	50	35	50
~~2-Methylnapthalene~~	~~X~~	~~65-135~~	~~65-135~~	~~< 30~~	~~< 30~~	~~45-140~~	~~45-140~~	~~<30~~	~~<30~~	~~20~~	~~40~~	~~35~~	~~50~~	~~35~~	~~50~~
Surrogate															
p-terphenyl		65-135	65-135	< 30	< 30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals by ICP-AES															
EPA Methods SW6010B/6020															
Aluminum		80-120	80-120	< 30	< 30	75-125	75-125	<30	<30	20	40	35	50	35	50
Antimony		75-125	75-125	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Arsenic	X	75-125	75-125	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Barium	X	80-120	80-120	< 30	< 30	75-125	75-125	<30	<30	20	40	35	50	35	50
Beryllium	X	80-120	80-120	< 30	< 30	75-125	75-125	<30	<30	20	40	35	50	35	50
Cadmium	X	80-120	80-120	< 30	< 30	75-125	75-125	<30	<30	20	40	35	50	35	50
Calcium		80-120	80-120	< 30	< 30	75-125	75-125	<30	<30	20	40	35	50	35	50
Chromium		80-120	80-120	< 30	< 30	75-125	75-125	<30	<30	20	40	35	50	35	50
Cobalt	X	80-120	80-120	< 30	< 30	75-125	75-125	<30	<30	20	40	35	50	35	50

Table 4: Laboratory Precision and Accuracy Goals
Hamilton Army Airfield - Quality Assurance Project Plan

Method and Parameters	Control Compounds	Laboratory Control Sample & Surrogates*				Matrix Spike (MS)/MS Duplicate				Lab Duplicate				Field Duplicate	
		Lab Control Limit		Rejection Criteria		Lab Control Limit		Rejection Criteria		Lab Control Limit		Advisory Limit**		Advisory Limit**	
		Water %	Soil %	Water %	Soil %	Water %	Soil %	Water %	Soil %	Water RPD	Soil RPD	Water RPD	Soil RPD	Water RPD	Soil RPD
Copper		80-120	80-120	< 30	< 30	75-125	75-125	<30	<30	20	40	35	50	35	50
Iron		80-120	80-120	< 30	< 30	75-125	75-125	<30	<30	20	40	35	50	35	50
Lead	X	75-125	75-125	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Magnesium		80-120	80-120	< 30	< 30	75-125	75-125	<30	<30	20	40	35	50	35	50
Manganese	X	80-120	80-120	< 30	< 30	75-125	75-125	<30	<30	20	40	35	50	35	50
Molybdenum		80-120	80-120	< 30	< 30	75-125	75-125	<30	<30	20	40	35	50	35	50
Nickel	X	80-120	80-120	< 30	< 30	75-125	75-125	<30	<30	20	40	35	50	35	50
Potassium		80-120	80-120	< 30	< 30	75-125	75-125	<30	<30	20	40	35	50	35	50
Selenium		75-125	75-125	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Silver		75-125	75-125	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Sodium		80-120	80-120	< 30	< 30	75-125	75-125	<30	<30	20	40	35	50	35	50
Thallium		75-125	75-125	< 30	< 30	60-140	60-140	<30	<30	20	40	35	50	35	50
Titanium		80-120	80-120	< 30	< 30	75-125	75-125	<30	<30	20	40	35	50	35	50
Vanadium		80-120	80-120	< 30	< 30	75-125	75-125	<30	<30	20	40	35	50	35	50
Zinc	X	80-120	80-120	< 30	< 30	75-125	75-125	<30	<30	20	40	35	50	35	50
Metals by CVAA															
EPA Methods SW7470A/SW7471A															
Mercury		80-120	80-120	< 30	< 30	75-125	75-125	<30	<30	20	40	35	50	35	50
Reactivity															
SW846 Chapter 7															
Cyanide, Reactive	X	40-120	40-120	< 30	< 30	30-120	30-120	<30	<30	20	40	35	50	35	50
Sulfide, Reactive		40-120	40-120	< 30	< 30	30-120	30-120	<30	<30	20	40	35	50	35	50

Notes

* Surrogate criteria apply to all samples

** All results outside of Advisoy Limits are reviewed by the Project Chemist

NA = Not Applicable

Table 7A: Analytical Methods Summary For Water Samples
Hamilton Army Airfield - Quality Assurance Project Plan

Parameter	Preparation Method	Analysis Method	Description
Volatile Petroleum Hydrocarbons	SW5030B	SW8015B	Purge and trap sample concentration. Capillary GC with FID detection.
Extractable Petroleum Hydrocarbons	SW3510C, SW3520C	SW8015B	Methylene chloride extraction by separatory funnel or methylene chloride extraction with continuous liquid-liquid extractors. Silica gel cleanup option. Capillary GC with FID detection.
OC Pesticides	SW3510/SW3520C	SW8081A	Methylene chloride extraction with continuous liquid-liquid extractors. Capillary GC with ECD detection. 2nd column confirmation required.
VOCs	SW5030B	SW8260B	Purge and trap sample concentration. Capillary GC with MS detection.
SVOCs	SW3510/SW3520C	SW8270C and SW8270C SIM	Methylene chloride extraction with continuous liquid-liquid extractors. 3510C or other methods may be required for some compounds. Capillary GC with Full Scan or Selected Ion MS detection
PAHs	SW3510/SW3520C	SW8310	Methylene chloride extraction with continuous liquid-liquid extractors. Cleanup options GPC/silica gel Reverse phase HPLC with UV and fluorescence detection
ICP-AES Metals	SW3010A	SW6010B	HNO_3 acid digestion; HCl reflux. Multielement determination by ICP-AES including As, Tl, Se, & Pb if axial torch ICP.

Table 7A: Analytical Methods Summary For Water Samples
Hamilton Army Airfield - Quality Assurance Project Plan

Parameter	Preparation Method	Analysis Method	Description
PCBs	SW3510/SW3520C	SW8082	Methylene chloride extraction with continuous liquid-liquid extractors. Capillary GC with ECD detection.
Mercury	SW7470A	SW7470A	HNO_3, H_2SO_4, and $KMnO_4$ digestion. Reduce Hg with $SnCl_2$. AA determination in closed, room temperature system.

Table 7B: Analytical Methods Summary For Soil and Solid Samples
Hamilton Army Airfield - Quality Assurance Project Plan

Analyte(s)	Preparation Method	Analytical Method	Summary
TPH-Gasoline	SW5035	SW8015B	Closed system purge and trap concentration. Capillary GC with FID detection.
TPH-Diesel/Motor Oil	SW3550B	SW8015B	Ultrasonic extraction with methylene chloride with silica gel clean up for all TPH-extractable soil samples. Capillary GC with FID detection.
OC Pesticides	SW3540C, SW3550B, SW3545	SW8081A	Soxhlet extraction with hexane:acetone (1:1); GPC cleanup; Ultrasonic extraction with hexane:acetone (1:1); or high temperature and pressure solvent extraction. Cleanup options: GPC, florisil. Capillary GC with ECD detection. 2nd column confirmation required.
VOCs	SW5035	SW8260B	Closed-system purge and trap concentration. Capillary GC with MS detection
SVOCs	SW3540C, SW3550B, SW3545	SW8270C and SW8270C SIM	Soxhlet extraction with hexane:acetone (1:1); GPC cleanup; Ultrasonic extraction with hexane:acetone (1:1); GPC cleanup; or high temperature and pressure solvent extraction. Capillary GC with MS detection. For certain compounds, Selected Ion Monitoring Techniques may be used.
PAHs	SW3540C, SW3550B, SW3545	SW8310	Soxhlet extraction with hexane:acetone (1:1); GPC cleanup; Ultrasonic extraction with hexane:acetone (1:1); or high temperature and pressure solvent extraction. Cleanup Options: GPC, Silica Gel Reverse phase HPLC with UV and fluorescence detection.

Table 7B: Analytical Methods Summary For Soil Samples
Hamilton Army Airfield - Quality Assurance Project Plan

Analyte(s)	Preparation Method	Analytical Method	Summary
PCBs	SW3540C, SW3550B, SW3545	SW8082	Soxhlet extraction with hexane:acetone (1:1); GPC cleanup; Ultrasonic extraction with hexane:acetone (1:1); or high temperature and pressure solvent extraction. Cleanup options: GPC, florisil, H_2S0_4.
ICP-AES Metals	SW3050A	SW6010B	HNO_3 and H_2O_2 digestion; HNO_3 reflux digestion; HCl acid reflux. Multielement determination by ICP-AES including As, Tl, Se, and Pb if axial torch ICP.
Mercury	SW7471A	SW7471A	$HCl:HNO_3$ (3:1), $KMnO_4$ digestion. Reduce Hg with $SnCl_2$. AA determination in closed, room temperature system.

Table 10: Data Validation Scheme
Hamilton Army Airfield - Quality Assurance Plan

Control Parameter	Exceedance of Control Limits	Qualification of Detected Results	Qualification of Nondetected Results	Associated Results	Reason Code
Holding Times (All Methods)	Holding Time > CL	J-	UJ or R based on reviewer discretion	All analyte results in affected sample	H
Laboratory Blanks	Analyte detected in blank. Determine action level: multiply value by 10 for common lab contaminants or by 5 for other analytes	If detected < PQL, U at PQL. If detected > PQL, U	Not qualified	Analyte results in the preparation or/and analytical batch	B
Trip Blanks	Same as laboratory blanks	If detected < PQL, U at PQL. If detected > PQL, U	Not qualified	Analyte results in samples in the same cooler (volatiles only)	K
Field Blanks	Same as laboratory blanks	If detected < PQL, U at PQL. If detected > PQL, U	Not qualified	Same day	K
Equipment Blanks	Same as laboratory blanks	If detected < PQL, U at PQL. If detected > PQL, U	Not qualified	Analyte results in associated samples	K
Calibration Blanks (Inorganic Methods)	Same as laboratory blanks (adjust reporting limits for soil units)	If detected < PQL, U at PQL. If detected > PQL, U	Not qualified		B1
Surrogate Recovery (Purgeable Organics)	rec > UCL LCL > rec > 50% rec < 30%	J+ J- J-	Not qualified UJ R	All associated analyte results in affected sample	S
Surrogate Recovery (Extractable Organics)	rec > UCL LCL > rec > 30% rec < 30%	J+ J- J-	Not qualified UJ R	All associated analyte results in affected sample	S
LCS Recovery (Purgeable Organics)	rec > UCL LCL > rec > 50% rec < 30%	J+ J- J-	Not qualified UJ R	All method results in analytical batch or sub-analytical batch	L
LCS Recovery (Extractable Organics)	rec > UCL LCL > rec > 30% rec < 30%	J+ J- J-	Not qualified UJ R	All method results in the preparation batch	L
LCS Recovery (Inorganic Methods)	rec > UCL LCL > rec > 50% rec < 30%	J+ J- J-	Not qualified UJ R	All method results in analytical batch or sub-analytical batch	L
MS/MSD Recoveries (Purgeable Organics) (Native amount on parent <= to 4Xs the spike concentration)	rec > UCL LCL > rec > 30% rec < 30%	J+ J- J-	Not qualified UJ R	AQUEOUS: All analyte results in analytical batch SOIL: All analyte results in parent sample	M

Table 10: Data Validation Scheme
Hamilton Army Airfield - Quality Assurance Plan

Control Parameter	Exceedance of Control Limits	Qualification of Detected Results	Qualification of Nondetected Results	Associated Results	Reason Code
MS/MSD Recoveries (Extractable Organics)	rec > UCL LCL > rec > 30% rec < 30%	J+ J- J-	Not qualified UJ R	AQUEOUS: All analyte results in analytical batch SOIL: All analyte results in parent sample (Native amount on parent >= to 4Xs the spike concentration, no qualification)	M
MS Recovery (Inorganic Methods) (Native amount on parent <= to 4Xs the spike concentration)	rec > UCL LCL > rec > 30% rec < 30%	J+ J- J-	Not qualified UJ R	Analyte results in the analytical batch (Native amount on parent >= to 4Xs the spike concentration, no qualification)	M
MS/MSD RPD (Organic Methods)	RPD > CL	J	Not qualified	Analyte results in the analytical batch (Native amount on parent >= to 4Xs the spike concentration, no qualification)	D1
Matrix Duplicate RPD (Inorganic Methods)	RPD > CL and sample and duplicate results > 5X PQL RPD > CL and sample and/or duplicate results < 5X PQL and difference > PQL	J J	Not qualified Not qualified	Analyte results in the analytical batch (Native amount on parent >= to 4Xs the spike concentration, no qualification) Analyte results in the analytical batch	D2
Initial Calibration %RSD (Organic Methods)	%RSD > CL	J	UJ	Analyte results in the analytical batch	G1
RRF	RRF≤CL	J	R	Ketones CL= 0.01 All other compounds CL=0.05	G2
Initial Calibration and Continuing Calibration (ICV and CCV) Recovery (Inorganic Methods)	rec > 125% 125% > rec > UCL LCL > rec > 75% rec < 30%	R J+ J- R	Not qualified Not qualified UJ R	Analyte results in the analytical batch or sub-analytical batch	C
Continuing Calibration %Recovery (Organic Methods)	%Recovery > UCL -50% < %D < LCL %Recovery < -50%	J+ J J-	Not qualified UJ R	Analyte results in the analytical batch	C
Continuing Calibration %D (Organic Methods based on: [[Result-ICCAL]-[Result-CICAL]/[Result-ICAL]]	%D > UCL -50% < %D < LCL %D < -50%	~~J-~~ J+ J ~~J+~~ J-	~~R~~Not qualified UJ ~~Not qualified~~R	Analyte results in the analytical batch	C

Table 10: Data Validation Scheme
Hamilton Army Airfield - Quality Assurance Plan

Control Parameter	Exceedance of Control Limits	Qualification of Detected Results	Qualification of Nondetected Results	Associated Results	Reason Code
Tuning Mass Assignment	In error	R	R	Analyte results in batch	P
Field Duplicate RPD (All Methods)	RPD > CL	Not qualified; discuss impact in report	Not qualified; discuss impact in report	Analyte results in the sample and duplicate	V
Internal Standard Area Counts	Area counts > 2X the associated standard	Professional Judgement		Associated analyte results in the sample	I
	Area counts < 0.5X the associated standard	Professional Judgement		Associated analyte results in the sample	
DDT and Endrin Breakdown	DDT %Breakdown >20% DDT/Endrin %Breakdown >30% Endrin %Breadown >20 percent	DDT results J DDD,DDE NJ Endrin Results J Endrin Ketone, Endrin Aldehyde NJ	DDT PQL R Endrin PQL R		W
	Combined Breadown> 30 %	As above	As above		
Percent Difference Between Columns or Techniques	%D>25%	Professional Jundgement	NA	Evaluate for interference; Flag J if quantitation estimated; Flag N if identification uncertain Flag NJ if both quantitation and identification uncertain. Narrate evaluation in report	P
Interference Check (Inorganics only)	Sample result < 5 Xs interference (corrected for matrix)	J+	Profession Judgement	Interfering analyte in afffected samples	O
ICP Serial Dilution	%D>10	J	Not qualified	Analyte results in the analytical batch	A

CL Control limit.
UCL Upper control limit.
LCL Lower control limit.
Purgeable Organics EPA 8021A, EPA 8260B, and EPA 8015B (Gasoline).
Extractable Organics All other organic methods.

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April 18, 2002

DCN: ACE13-054-H

Mr. Doug Stanley, Contracting Officer CT-B
U.S. Army Corps of Engineers, Sacramento District
1325 "J" Street, TERC Unit 9th Floor
Sacramento, California 95814

Subject: **Sacramento TERC II – Contract No. DACW05-96-D-0011**
Contract Task Order No. 13, WADs 5 and 6
Hamilton Army Airfield, Novato, CA
Field Work Variances 831471-012 and 831471-013

Dear Mr. Stanley:

Enclosed are Field Work Variances (FWV) 831471-013 and 831471-014. FWV 831471-013 is for WAD 5, Removal of Revetment 6. In this FWV, we propose to excavate an additional 124 cy of contaminated soil and to remove the asphalt skirt, which is 29 feet wide. In FWV 831471-014, which is for WAD 6, Removal of Revetment 7, we propose to excavate an additional 127 cy of contaminated soil and remove a smaller volume of concrete than is stated in the Work Plan. These changes will be made to be consistent with the instructions of the HAAF BEC and the RAP/ROD for the project.

Should you have any questions regarding these FWVs, please contact me at (925) 288-2253.

Sincerely,

Nora M. Okusu
Senior Project Manager

Enclosure

cc:

IT Corp.	USACE	HAAF
V. Taylor	R. Zimny	E. Keller (2 copies)
S. Elkind	C. Fong	
D. Bushnell		
L. Mason		
B. Matz		
M. Reed		
TERC II Files		

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Field Work Variance No. 831471-013

Page 1 of 2

FIELD WORK VARIANCE

Project Name/Number	Hamilton Army Airfield / 831471	CTO/WADs	13 / 5
Applicable Document	Work Plan for Bldg. 41 Demolition, Spoils Pile F Removal, and Revetments 6 & 7 Removal, Rev. 1 (Dec 2001)	Date	8 April 02

Problem Description:

1. Actual quantities of stained soil at Revetment 6 are expected to exceed quantities estimated in the Work Plan.
   - Stained soil removal is estimated to exceed the 370 cubic yards estimated in the Work Plan. Based on visual observations after the concrete pad was removed, the estimated volume of stained soil to be removed is 494 cubic yards. A sketch is attached showing the locations of the proposed excavations.

2. Actual quantities of demolition material at Revetment 6 are expected to exceed quantities estimated in FWV#-011.
   - An asphalt skirt surrounds the concrete at Revetment 6. The asphalt is 29 feet wide and varies in thickness from 4" to 2'. It was initially estimated to not exceed 4" thickness. At the start of the removal action it was discovered that there were several layers of asphalt separated by thin layers of baserock. Current excavation estimates are for 554 cubic yards of asphalt and baserock construction debris.

Recommended solution: See Page 2 of 2, Recommended Solution (continued).

Impact on present and completed work: None.

Requested by: Nora Okusu, Project Manager

Recommended solution/disposition: *Concur with recommended solution.*

Clarification ☐ Minor Change X Major Change ☐

Signature _____ Date _____
Technical Reviewer

IT Corporation Approvals: *If Major Change:*

Signature _____ Date 4-18-02 Signature _____ Date 4/18/02
Project/Task Manager *Sr. Project Manager*

Signature _____ Date 4-18-02
Project COCSM

USACE Approval: *If Major Change:*

Approved ☐ Rejected ☐ Signature _____ Date _____
USACE PM or COR

DTSC Approval: *If Major Change:*

Approved ☐ Rejected ☐ Signature _____ Date _____
Agency Representative

Final Description
Signature _____ Date _____

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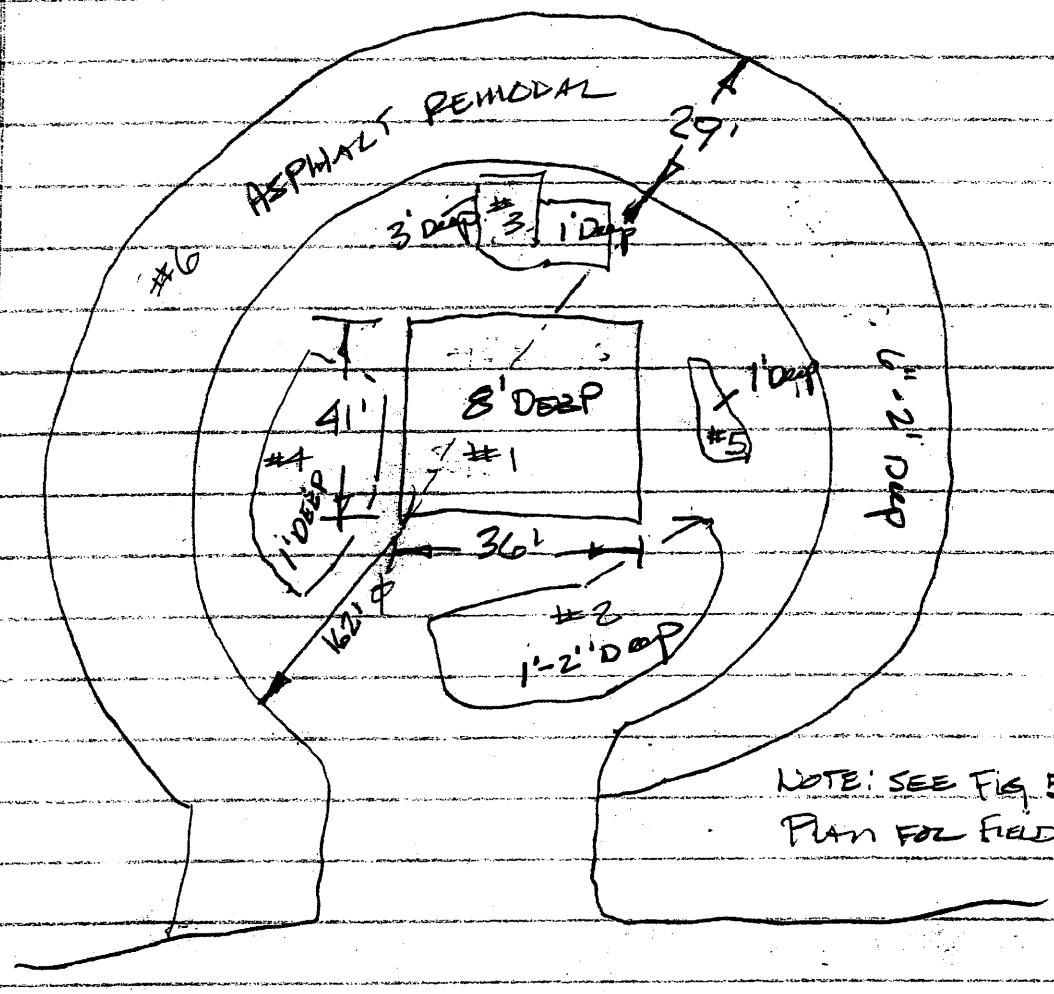
FIELD WORK VARIANCE CONTINUATION SHEET

Continue FWV discussions below by noting section title(s) to be continued (i.e., Problem Description, Solution/disposition, Final Disposition, etc). Use additional continuation sheets as needed.

Recommended Solution (continued):

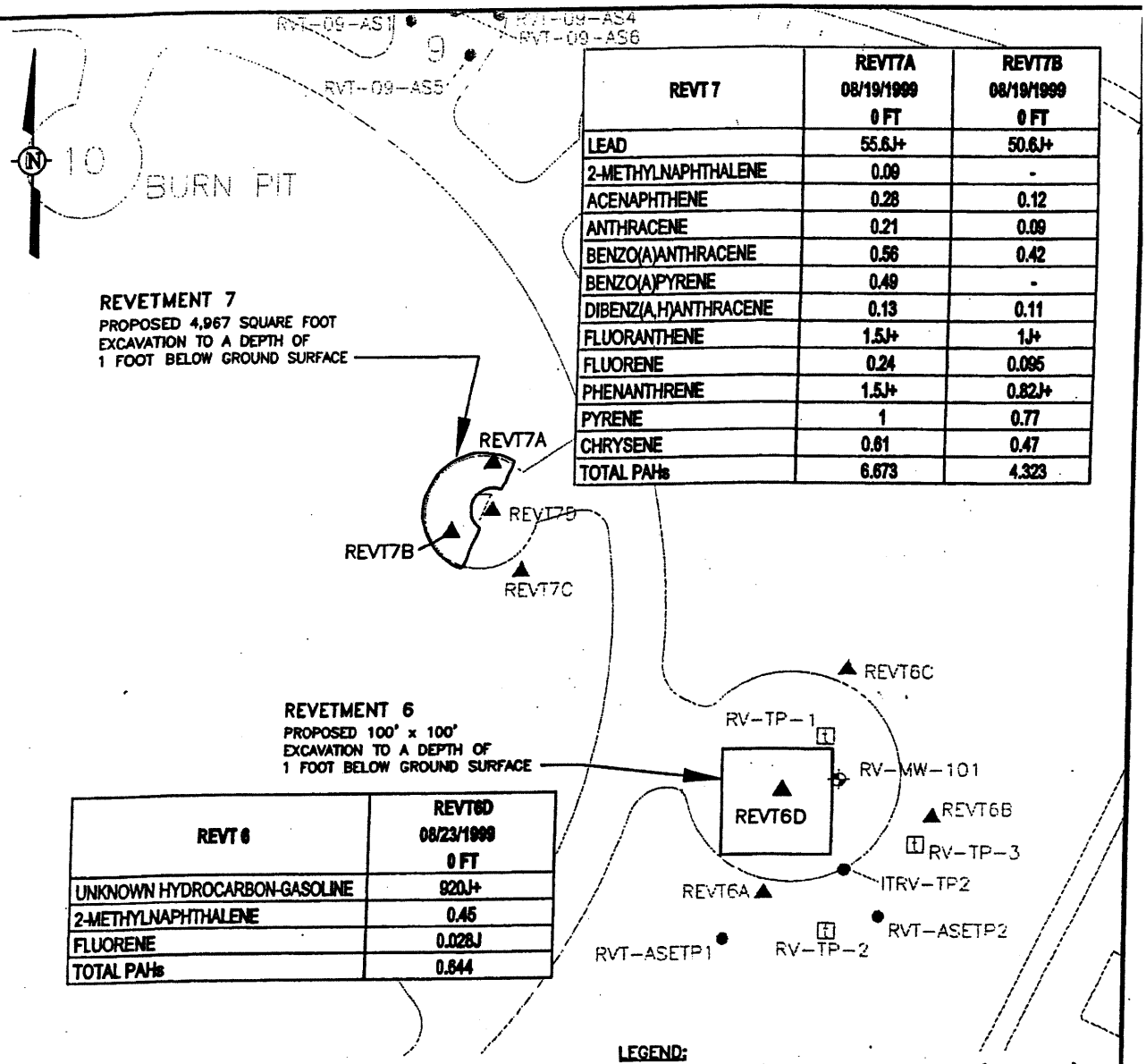
1. Perform excavation, sampling and off-haul of additional materials in order to meet the intent of the Work Plan guidance.

Revetment #6 Planned Soil Excavations



NOTE: SEE Fig. 5 OF WOI
PLAN FOR FIELD LOCATION

Exc#	Planned Volume	Soil Type
#1	437 Bank Yards	Stained Soil
#2	15 " "	" "
#3	19 " "	" "
#4	21 " "	" "
#5	2 " "	" "
#6	554 " "	Asphalt Debris



REVT 7	REVT7A 08/19/1999 0 FT	REVT7B 08/19/1999 0 FT
LEAD	55.6J+	50.6J+
2-METHYLNAPHTHALENE	0.09	-
ACENAPHTHENE	0.28	0.12
ANTHRACENE	0.21	0.09
BENZO(A)ANTHRACENE	0.56	0.42
BENZO(A)PYRENE	0.49	-
DIBENZ(A,H)ANTHRACENE	0.13	0.11
FLUORANTHENE	1.5J+	1J+
FLUORENE	0.24	0.095
PHENANTHRENE	1.5J+	0.82J+
PYRENE	1	0.77
CHRYSENE	0.61	0.47
TOTAL PAHs	6.673	4.323

REVT 6	REVT6D 08/23/1999 0 FT
UNKNOWN HYDROCARBON-GASOLINE	920J+
2-METHYLNAPHTHALENE	0.45
FLUORENE	0.028J
TOTAL PAHs	0.544

SCALE

0 150 300 FEET

LEGEND:

- 1999 INTERIM REMOVAL ACTION SAMPLE (IT, 2000a)
- REMEDIAL INVESTIGATION SAMPLE (IT, 1999a)
- MONITORING WELL (IT, 1999a)
- TEST PIT AND SOIL SAMPLE LOCATION (IT, 1999a)
- REMEDIAL DESIGN INVESTIGATION SOIL SAMPLE (FW, 2000)
- CONFIRMATION SOIL SAMPLE

Acronyms:

J — J qualifier indicates estimated value. +/− indicates high or low estimation

PAHs — Polynuclear Aromatic Hydrocarbons

Notes:

1. Results are presented in units of milligrams per kilogram.
2. Sample locations shown screened back did not have concentrations for chemicals of concern above the comparison values.
3. A dashed line in the table of results indicates that the result was below the comparison value.
4. All concentrations at Revetment 10 are below comparison values. Sample locations are not shown due to density of sampling and scale of drawing.

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FIGURE 5
REVETMENTS 6 AND 7
INBOARD AREA SITES

BRAC PROPERTY
HAMILTON ARMY AIRFIELD

IMAGE	X-REF	OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
---	---	Concord	R. Bricker 11/29/01	11-29-01	11/29/01	831471-A2

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Field Work Variance No. 831471-014

Page 1 of 2

FIELD WORK VARIANCE

Project Name/Number	Hamilton Army Airfield / 831471	CTO/WADs	13 / 6
Applicable Document	Work Plan for Bldg. 41 Demolition, Spoils Pile F Removal, and Revetments 6 & 7 Removal, Rev. 1 (Dec 2001)	Date	8 April 02

Problem Description:

1. Actual quantities of stained soil at Revetment 7 are expected to exceed quantities estimated in the Work Plan.
   - Stained soil removal is estimated to exceed the 184 cubic yards estimated in the Work Plan. Based on visual observations after the concrete pad was removed, the estimated volume of stained soil to be removed is 311 cubic yards. A sketch is attached showing the locations of the proposed excavations. At the request of the BEC excavation is to proceed at one/half foot increments.
2. Actual quantities of construction debris at Revetment 7 are expected to be less than those listed in the work plan.
   - Revised estimated quantities of concrete is 300 cys and baserock is 145 cys for a total of 445 cys, or 555 cys less than the Work Plan.

Recommended solution: See Page 2 of 2, Recommended Solution (continued).

Impact on present and completed work: None.

Requested by: Nora Okusu, Project Manager

Recommended solution/disposition: *Concur with recommended solution.*

Clarification Minor Change X Major Change ☐

Signature _____ Date _____
Technical Reviewer

IT Corporation Approvals: *If Major Change:*

Signature _____ Date 4-18-02 Signature _____ Date 4/18/02
Project/Task Manager *Sr. Project Manager*

Signature _____ Date 4-18-02
Project COCSM

USACE Approval: *If Major Change:*

Approved ☐ Rejected ☐ Signature _____ Date _____
USACE PM or COR

DTSC Approval: *If Major Change:*

Approved ☐ Rejected ☐ Signature _____ Date _____
Agency Representative

Final Description
Signature _____ Date _____

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Field Work Variance No. 831471-014

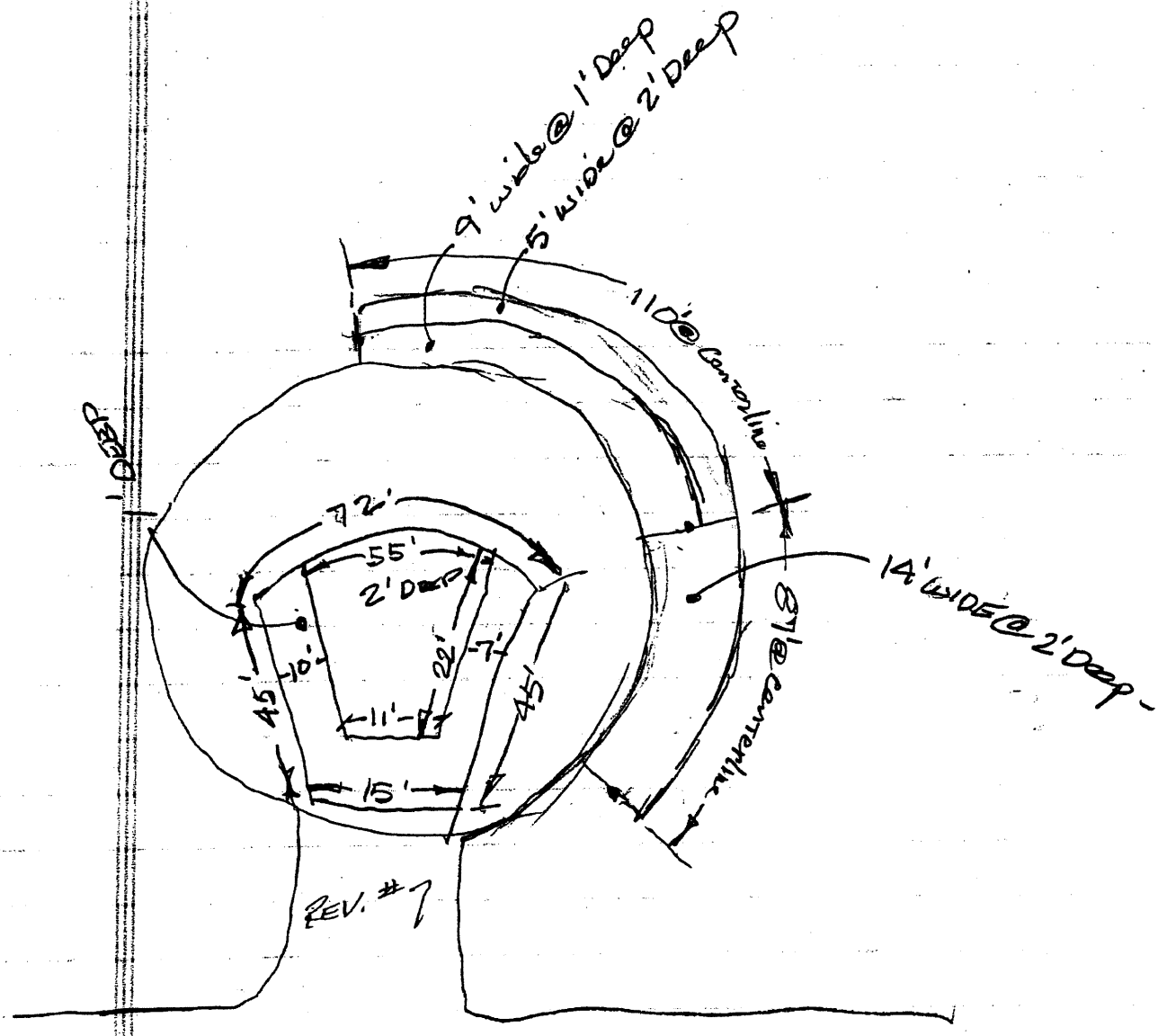
FIELD WORK VARIANCE CONTINUATION SHEET

Continue FWV discussions below by noting section title(s) to be continued (i.e., Problem Description, Solution/disposition, Final Disposition, etc). Use additional continuation sheets as needed.

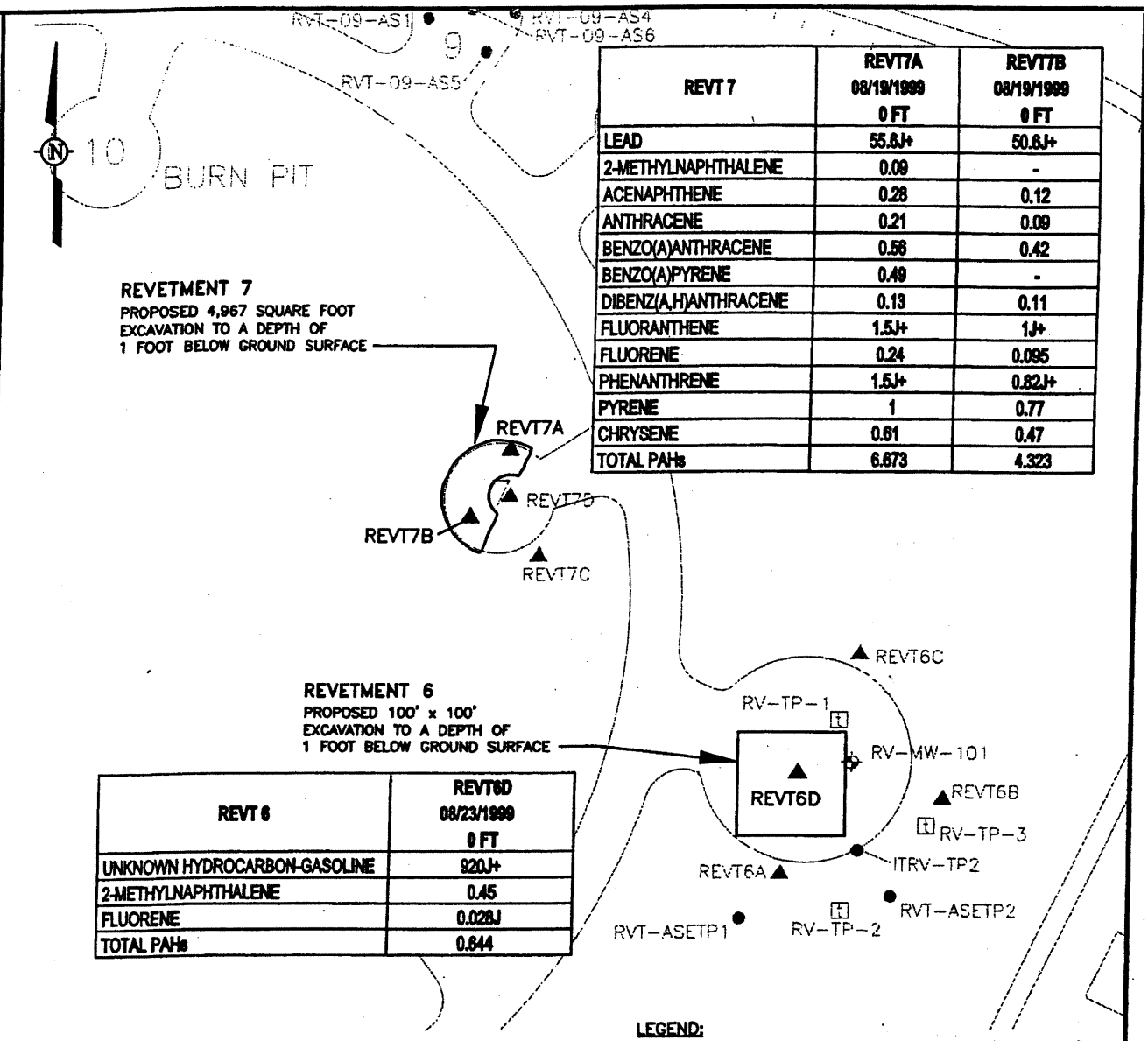
Recommended Solution (continued):

1. Perform excavation, sampling and off-haul of additional soils in order to meet the intent of the Work Plan guidance.

REVETMENT #7 (PLANNED SOIL EXCAVATION



Perimeter 169 BANK CUBIC YARDS
Center 142 BANK CUBIC YARDS
311 BANK CUBIC YARDS



REVT 7	REVT7A 08/19/1999 0 FT	REVT7B 08/19/1999 0 FT
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ACENAPHTHENE	0.28	0.12
ANTHRACENE	0.21	0.09
BENZO(A)ANTHRACENE	0.58	0.42
BENZO(A)PYRENE	0.49	-
DIBENZ(A,H)ANTHRACENE	0.13	0.11
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FLUORENE	0.24	0.095
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PYRENE	1	0.77
CHRYSENE	0.61	0.47
TOTAL PAHs	6.673	4.323

REVT 6	REVT6D 08/23/1999 0 FT
UNKNOWN HYDROCARBON-GASOLINE	920J+
2-METHYLNAPHTHALENE	0.45
FLUORENE	0.028J
TOTAL PAHs	0.644

SCALE

0 150 300 FEET

LEGEND:

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- ● REMEDIAL INVESTIGATION SAMPLE (IT, 1999a)
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- TEST PIT AND SOIL SAMPLE LOCATION (IT, 1999a)
- ▲ REMEDIAL DESIGN INVESTIGATION SOIL SAMPLE (FW, 2000)
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FIGURE 5
REVETMENTS 6 AND 7
INBOARD AREA SITES

BRAC PROPERTY
HAMILTON ARMY AIRFIELD

DRAWING NUMBER 831471-A2
APPROVED BY 11/29/01
CHECKED BY 11-29-01
DRAWN BY R. Bricker 11/29/01
OFFICE Concord
X-REF ---
IMAGE ---