CAFB99

CARL W.

DEPARTMENT OF THE AIR FORCE

HEADQUARTERS 27th FIGHTER WING (ACC)
CANNON AIR FORCE BASE NEW MEXICO

11 JAN 1999

ENTERED

RECEIVED JAN 1999

Colonel James A. Thomas III
Commander, 27th Support Group
110 E Sextant Avenue Suite 1098
Cannon AFB NM 88103-5323

Mr. Benito J. Garcia, Chief
Hazardous and Radioactive Materials Bureau
New Mexico Environment Department
2044 Galisteo Street
P O Box 26110
Santa Fe NM 87502

Dear Mr. Garcia

Enclosed is the report for the latest groundwater sampling at Landfill 5 (SWMU #97) which was collected on 12 Aug 98. This data is furnished for your information and records.

If you have any questions about this report, please call Mr. Sanford Hutsell at (505) 784-6378.

Sincerely

James A. Thomas III

JAMES A. THOMAS III, Colonel, USAF

Attachment:
Groundwater Monitoring Report

cc:
NMED w/o atch (C. Will)
NMED GW Bureau (J. Jacobs)
EPA Region VI (D. Neleigh)
EPA Region VI (B. Sturdivant)

LIBRARY COPY

Cannon Air Force Base, New Mexico

RCRA Ground-Water Monitoring at Landfill 5

Analytical Results for Samples Collected August 12, 1998

Prepared for

United States Air Force Air Combat Command
Cannon Air Force Base, New Mexico

November 1998

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APPENDIX I

Analytical Results from Quanterra Environmental Services Laboratory for Ground-Water Samples Collected August 12, 1998

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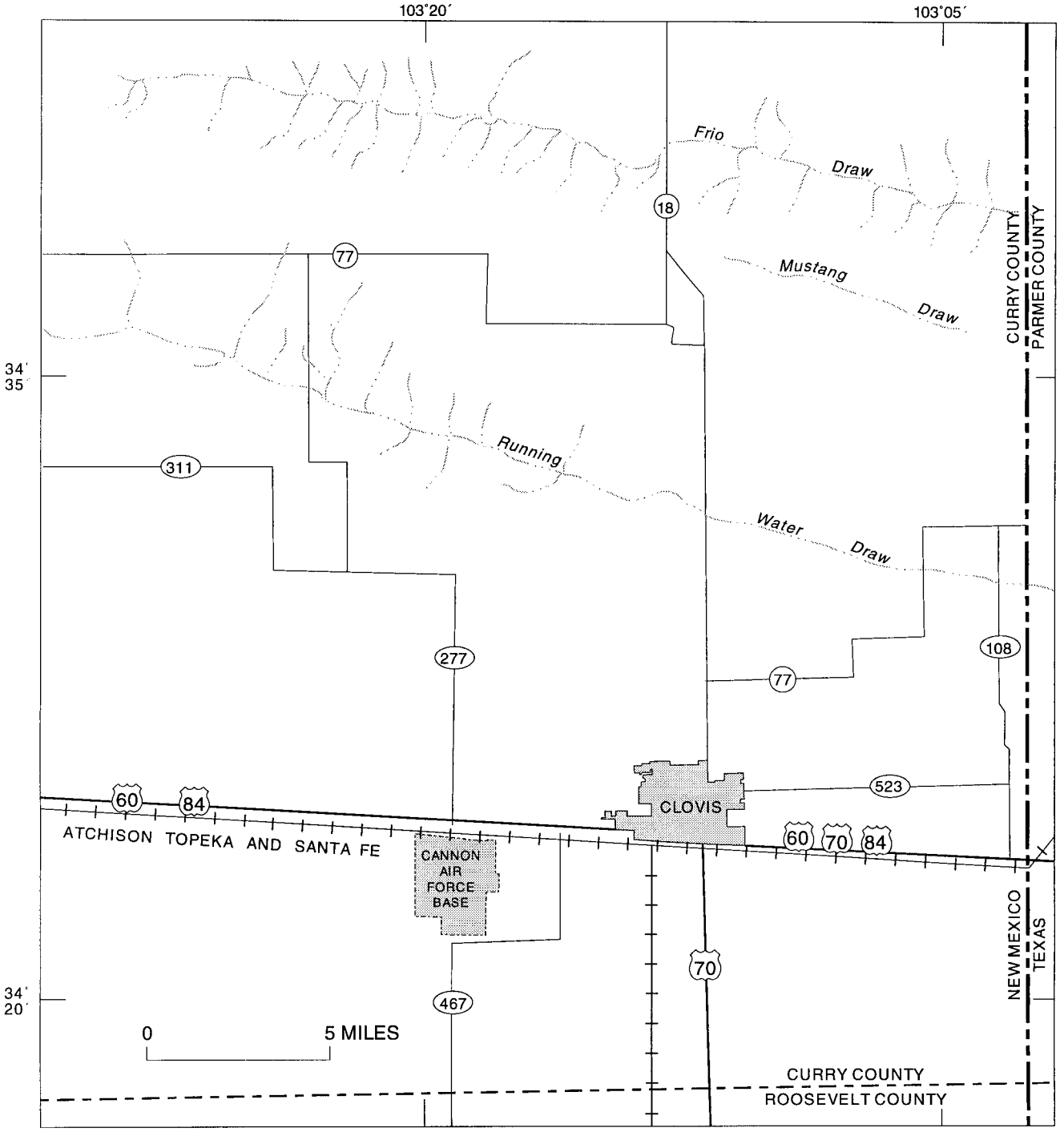
EXECUTIVE SUMMARY

The U.S. Geological Survey (USGS), Water Resources Division and the U.S. Air Force Air Combat Command (ACC) have a memorandum of understanding that addresses the USGS assisting any ACC base in their hydrology or environmental programs. The USGS has agreed to assist Cannon Air Force Base (CAFB), an ACC base, in their Resource Conservation and Recovery Act (RCRA) ground-water sampling program. Cannon AFB is located in east-central New Mexico about 5 miles west of Clovis as shown in Figure 1. Groundwater is sampled at Landfill 5 on the east side and southeast corner of the base as shown in Figure 2. The detection sampling is conducted semiannually at Landfill 5 (figure 3) as part of the July 13, 1990, Compliance Agreement between CAFB and the New Mexico Environment Department (NMED).

This report presents the water-quality data for samples collected from two wells around Landfill 5, CAFB on August 12, 1998. The monitoring wells sampled at Landfill 5 are downgradient well I and upgradient well Q as shown in figure 3. These wells were sampled for the following parameters: herbicides by method SW8150B; total organic carbon by method SW9060; and total organic halogens (TOX) by method SW9020B.

Concentrations of the analytes detected are presented on page I-4. All detected analytes were estimated results and less than the reporting limits.

As part of the quality assurance and quality control (QA/QC) procedures for the Landfill 5 site, one duplicate, one pair of matrix spike, and matrix spike duplicate samples were collected.



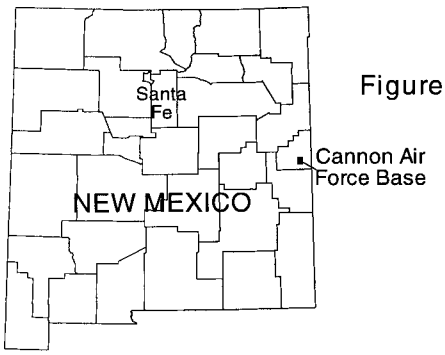


Figure 1.--Location of Cannon Air Force Base, New Mexico.

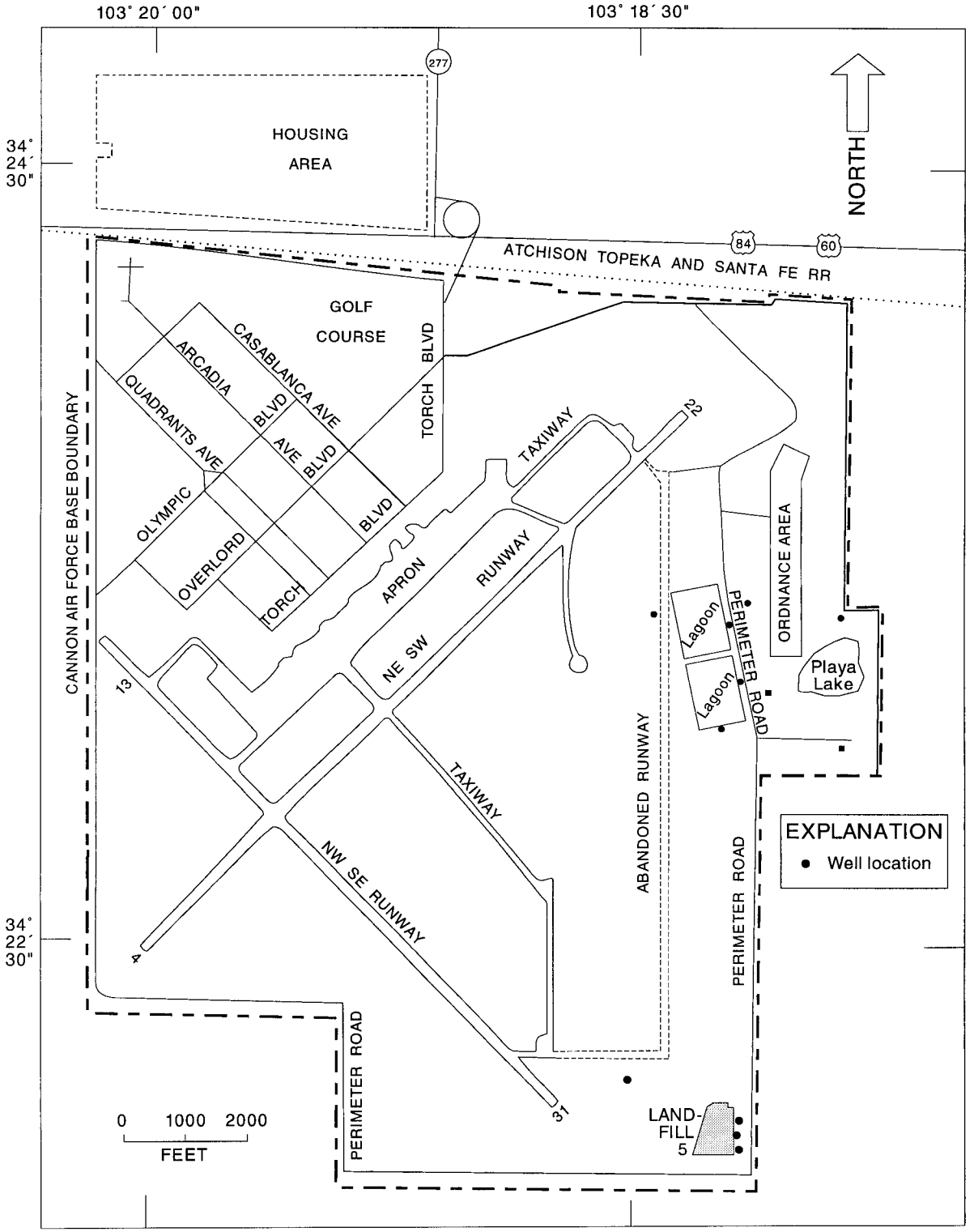


Figure 2.--Cannon Air Force Base and location of Landfill 5.

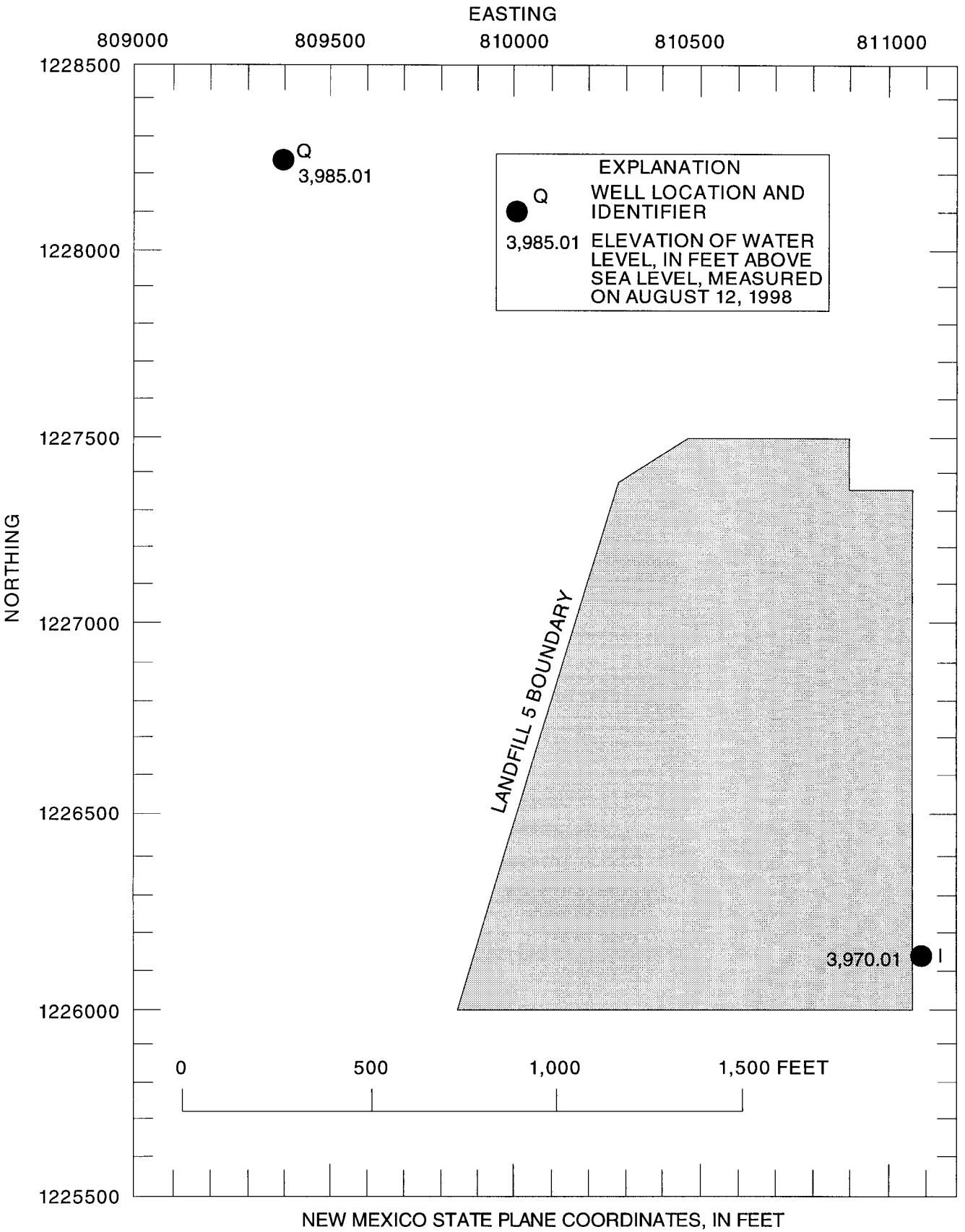


Figure 3.--Location of monitoring wells around Landfill 5.

MONITORING WELL IDENTIFICATION REPORT

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUEZ, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME Cannon Air Force Base

EPA I.D. NUMBER NM 7572124454

COUNTY Curry

WELL NUMBER I

WELL LOCATION (LONGITUDE) 103° 18' 06.8"

WELL LOCATION (LATITUDE) 34° 21' 58.8"

AQUIFER NAME Ogallala

AQUIFER CONFINED _____ UNCONFINED X

WELL INSTALLATION DATE 08-19-88

DRILLING METHOD HYDRT

INNER CASING DIAMETER 6 inches

BOREHOLE DIAMETER 9 7/8 inches

CASING MATERIAL PVC

METHOD OF DEVELOPMENT BAILD

ELEV BOTTOM OF BOREHOLE 3,959.36

ELEV BOTTOM OF WELL CASING 3,969.36

ELEV BOTTOM OF SCREENED INT 3,969.36

ELEV OF TOP OF SCREENED INT 3,989.36

SURVEYED ELEV OF CASING TOP 4,262.36

DATE OF REPORT 02-24-89 SIGNATURE _____

NAME (TYPED) Sanford Hutsell

MONITORING WELL IDENTIFICATION REPORT

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUEZ, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME Cannon Air Force Base

EPA I.D. NUMBER NM 7572124454

COUNTY Curry

WELL NUMBER Q

WELL LOCATION (LONGITUDE) 103° 18' 31"

WELL LOCATION (LATITUDE) 34° 22' 19"

AQUIFER NAME Ogallala

AQUIFER CONFINED _____ UNCONFINED X

WELL INSTALLATION DATE 02-24-96

DRILLING METHOD Unknown

INNER CASING DIAMETER 4 inches

BOREHOLE DIAMETER 8 inches

CASING MATERIAL PVC

METHOD OF DEVELOPMENT BAILD

ELEV BOTTOM OF BOREHOLE 3,969.30

ELEV BOTTOM OF WELL CASING 3,970.30

ELEV BOTTOM OF SCREENED INT 3,970.30

ELEV OF TOP OF SCREENED INT 4,000.30

SURVEYED ELEV OF CASING TOP 4,266.89

DATE OF REPORT 11-27-96 SIGNATURE _____

NAME (TYPED) Sanford Hutsell

MONITORING WELL
SEMI-ANNUAL SAMPLING REPORT

SAMPLE COLLECTED BY Jerry Larson

LABORATORY NAME Quanterra Environmental Services WELL NUMBER CAFB-I-1

WELL DEPTH 293.00 feet WELL CASING VOLUME 4.56 gallons

DATE SAMPLED 08-12-98 LABORATORY SAMPLE I.D.# D8H130197-001

TIME SAMPLED 1000 DATE RECEIVED BY LAB 08-13-98

PARAMETERS	STORET CODE	UNITS	VALUE	DATE
Elevation of G. Water	71993	ft.	3970.01	08-12-98
Flow Rate	00059	gal/min	0.88	08-12-98
Pump Period	72004	min.	45.0	08-12-98
Volume Evacuated	73675	gal	40.0	08-12-98
Well Sampling Method	84077	---	PSPMP	N/A

Sampler Material: TEFLON Well Sampling Method: BENNETT PUMP

PARAMETERS	STORET CODE	UNITS	VALUE	DETECTION LIMIT	DATE ANALYZED	METHOD USED
pH	00400	S.U.	7.84	N/A	08-12-98	field electrometer
Specific Conductivity	00095	umhos/cm	812	N/A	08-12-98	field electrometer
T.O.X.	70354	ug/L	7.9	30.0	08-12-98	SW9020
T.O.C.	00680	mg/L	0.33	1.0	09-02-98	SW9060

SIGNATURE: F. Eileen Roybal

NAME (PRINTED): F. Eileen Roybal

MONITORING WELL
SEMI-ANNUAL SAMPLING REPORT

SAMPLE COLLECTED BY Jerry Larson

LABORATORY NAME Quanterra Environmental Services WELL NUMBER CAFB-Q-1

WELL DEPTH 296.59 feet WELL CASING VOLUME 9.9 gallons

DATE SAMPLED 08-12-98 LABORATORY SAMPLE I.D.# D8H130197-003

TIME SAMPLED 0840 DATE RECEIVED BY LAB 08-13-98

PARAMETERS	STORET CODE	UNITS	VALUE	DATE
Elevation of G. Water	71993	ft.	3985.04	08-12-98
Flow Rate	00059	gal/min	1.0	08-12-98
Pump Period	72004	min.	35.0	08-12-98
Volume Evacuated	73675	gal	35.0	08-12-98
Well Sampling Method	84077	---	PSPMP	N/A

Sampler Material: TEFLON Well Sampling Method: BENNETT PUMP

PARAMETERS	STORET CODE	UNITS	VALUE	DETECTION LIMIT	DATE ANALYZED	METHOD USED
pH	00400	S.U.	7.65	N/A	08-12-98	field electrometer
Specific Conductivity	00095	umhos/cm	712	N/A	08-12-98	field electrometer
T.O.X.	70354	ug/L	11.3	30.0	09-02-98	SW9020
T.O.C.	00680	mg/L	ND	1.0	08-17-98	SW9060

SIGNATURE: F. Eileen Roybal

NAME (PRINTED): F. Eileen Roybal

APPENDIX I

Analytical Results from Quanterra Environmental Services Laboratory
for Ground-Water Samples Collected August 12, 1998

ANALYTICAL REPORT

Cannon Air Force Base

Lot #: D8H130197

Richard Daddow

US Geological Survey

QUANTERRA INCORPORATED

Christina Mott
Project Manager

September 8, 1998

Case Narrative

Standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits.

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Standard Deliverables With Supporting Documentation

Report Contents	Section	Number Of Pages
Standard Deliverables		
Introduction	A	25
• Table of Contents		
• Executive Summary – Detection Highlights		
• Analytical Methods Summary		
• Method/Analyst Summary		
• Lot Sample Summary		
• Analytical Results by Sample		
• QC Data Association Summary		
• Chain-of-Custody		
Supporting Documentation		
[Please Note: A one-page "Description of Supporting Documentation" is provided in the Supporting Documentation section(s).]		
Volatile GC/MS	B	
Semivolatile GC/MS	C	
Volatile GC	D	
Semivolatile GC	E	
LC/MS or HPLC	F	
Metals	G	
General Chemistry	H	
Subcontracted Data	I	

EXECUTIVE SUMMARY - Detection Highlights

D8H130197

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
CAFB I-1 08/12/98 10:00 001				
Total Organic Carbon	0.33 B	1.0	mg/L	SW846 9060
Total Organic Halogens	7.9 B	30.0	ug/L	SW846 9020B
CAFB I-2 08/12/98 10:10 002				
Total Organic Carbon	0.28 B	1.0	mg/L	SW846 9060
Total Organic Halogens	13.2 B	30.0	ug/L	SW846 9020B
CAFB Q-1 08/12/98 08:40 003				
Total Organic Halogens	11.3 B	30.0	ug/L	SW846 9020B

ANALYTICAL METHODS SUMMARY

D8H130197

PARAMETER	ANALYTICAL METHOD
Chlorinated Herbicides by GC	SW846 8150B
Total Organic Carbon	SW846 9060
Total Organic Halogens	SW846 9020B

References:

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

METHOD / ANALYST SUMMARY

D8H130197

ANALYTICAL METHOD	ANALYST	ANALYST ID
SW846 8150B	Houa Vue	003295
SW846 9020B	Judy M. Lange	002175
SW846 9060	Judy M. Lange	002175

References:

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

D8H130197

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
CKK4L	001	CAFB I-1	08/12/98	10:00
CKK4N	002	CAFB I-2	08/12/98	10:10
CKK4Q	003	CAFB Q-1	08/12/98	08:40

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

US GEOLOGICAL SURVEY

Client Sample ID: CAFB I-1

GC Semivolatiles

Lot-Sample #...: D8H130197-001 **Work Order #...:** CKK4L101 **Matrix.....:** WATER
Date Sampled...: 08/12/98 10:00 **Date Received..:** 08/13/98
Prep Date.....: 08/17/98 **Analysis Date..:** 08/24/98
Prep Batch #...: 8229252 **Analysis Time..:** 22:54
Dilution Factor: 1

Method.....: SW846 8150B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
2,4-D	ND	2.0	ug/L
2,4-DB	ND	5.0	ug/L
2,4,5-T	ND	0.50	ug/L
2,4,5-TP (Silvex)	ND	0.50	ug/L
Dalapon	ND	5.0	ug/L
Dicamba	ND	0.50	ug/L
Dichlorprop	ND	1.0	ug/L
Dinoseb	ND	1.0	ug/L
MCPA	ND	250	ug/L
MCPP	ND	250	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
CAA	74	(44 - 107)

US GEOLOGICAL SURVEY

Client Sample ID: CAFB I-2

GC Semivolatiles

Lot-Sample #...: D8H130197-002 Work Order #...: CKK4N101 Matrix.....: WATER
Date Sampled...: 08/12/98 10:10 Date Received..: 08/13/98
Prep Date.....: 08/17/98 Analysis Date..: 08/24/98
Prep Batch #...: 8229252 Analysis Time..: 23:20
Dilution Factor: 1

Method.....: SW846 8150B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
2,4-D	ND	2.0	ug/L
2,4-DB	ND	5.0	ug/L
2,4,5-T	ND	0.50	ug/L
2,4,5-TP (Silvex)	ND	0.50	ug/L
Dalapon	ND	5.0	ug/L
Dicamba	ND	0.50	ug/L
Dichlorprop	ND	1.0	ug/L
Dinoseb	ND	1.0	ug/L
MCPA	ND	250	ug/L
MCPP	ND	250	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
CAA	77	(44 - 107)

US GEOLOGICAL SURVEY

Client Sample ID: CAFB Q-1

GC Semivolatiles

Lot-Sample #...: D8H130197-003 Work Order #...: CKK4Q101 Matrix.....: WATER
Date Sampled...: 08/12/98 08:40 Date Received..: 08/13/98
Prep Date.....: 08/17/98 Analysis Date..: 08/24/98
Prep Batch #...: 8229252 Analysis Time..: 23:45
Dilution Factor: 1

Method.....: SW846 8150B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
2,4-D	ND	2.0	ug/L
2,4-DB	ND	5.0	ug/L
2,4,5-T	ND	0.50	ug/L
2,4,5-TP (Silvex)	ND	0.50	ug/L
Dalapon	ND	5.0	ug/L
Dicamba	ND	0.50	ug/L
Dichlorprop	ND	1.0	ug/L
Dinoseb	ND	1.0	ug/L
MCPA	ND	250	ug/L
MCPP	ND	250	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
DCAA	84	(44 - 107)

US GEOLOGICAL SURVEY

Client Sample ID: CAFB I-1

General Chemistry

Lot-Sample #...: D8H130197-001 Work Order #...: CKK4L Matrix.....: WATER
Date Sampled...: 08/12/98 10:00 Date Received..: 08/13/98

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Carbon	0.33 B	1.0	mg/L	SW846 9060	08/17/98	8229249
	Dilution Factor: 1			Analysis Time..: 16:25		
Total Organic Halogens	7.9 B	30.0	ug/L	SW846 9020B	09/02/98	8246260
	Dilution Factor: 1			Analysis Time..: 10:23		

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: CAFB I-2

General Chemistry

Lot-Sample #...: D8H130197-002 Work Order #...: CKK4N Matrix.....: WATER
Date Sampled...: 08/12/98 10:10 Date Received..: 08/13/98

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Carbon	0.28 B	1.0	mg/L	SW846 9060	08/17/98	8229249
		Dilution Factor: 1		Analysis Time..: 16:25		
Total Organic Halogens	13.2 B	30.0	ug/L	SW846 9020B	09/02/98	8246260
		Dilution Factor: 1		Analysis Time..: 10:23		

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: CAFB Q-1

General Chemistry

Lot-Sample #...: D8H130197-003 Work Order #...: CKK4Q Matrix.....: WATER
Date Sampled...: 08/12/98 08:40 Date Received..: 08/13/98

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Carbon	ND	1.0	mg/L	SW846 9060	08/17/98	8229249
		Dilution Factor: 1		Analysis Time..: 16:25		
Total Organic Halogens	**11.3 B**	**30.0**	**ug/L**	**SW846 9020B**	**09/02/98**	**8246260**
		Dilution Factor: 1		Analysis Time..: 10:23		

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

APPENDIX II

Laboratory Quality Assurance / Quality Control Results

LABORATORY DATA VALIDATION CHECKLIST

SECTION 1.0: GENERAL INFORMATION (*also see Appendix A*)

Data reviewer(s) name, affiliation, title, signature, and date of review:

F. Eileen Roybal, USGS-WRD, Hydrologist F. Eileen Roybal 15OCT98

DATA INVENTORY

1.1 Sample project number: Quanterra Environmental Services D8H130197

1.2 Operable unit and site: Landfill 5 unit, Cell 3

Sample collection date: 12AUG98

1.3 Sample locations (location IDs): Wells CAFB-I, and CAFB-Q; CAFBI-2 was a duplicate sample for CAFB-I.

1.4 Sample matrix (ground water, soil, other): ground water

1.5 Type and number of field samples (environmental and quality control) in sample project:

Type	number	Type	number
environmental	2	MS/MSD	1 pair
field duplicate	1	trip blank	0
equipment blank	1	ambient blank	0

Data validation level: **(circle one)** note--see appendix A for description of different levels

LEVEL 1 **LEVEL 2**

OTHER CHECKLIST SECTIONS COMPLETED FOR SAMPLE PROJECT:

√ 2.0 Data Reports and Completeness
√ 3.0 Herbicides--Method SW3520/SW8150B
√ 4.0 Total Organic Carbon (TOC)--Method SW9060
√ 5.0 Total Organic Halogens (TOX)--Method SW9020B

SECTION 2.0: DATA REPORTS AND COMPLETENESS

Name of reviewer(s) and review date: F. Eileen Roybal 15OCT98

LABORATORY DATA REPORTS

2.1 Analytical Results Report--report date: 08SEP98

2.2 Raw Data Report--number of volumes: N/A

2.3 Was completeness of lab reports acceptable? yes √ no ____

(overview, analytical results, quality-control report)

Lab reports were complete and acceptable.

DATA COMPLETENESS

2.4 Were all samples requested on chain of custody form analyzed by lab? yes √ no ____

	Herbicide SW8150B	TOC SW9060	TOX SW9020
requested:	5	5	5
analyzed:	5	5	5

2.5 List cancelled analyses on cancelled-data worksheet: None.

2.6 Was sample cooler seal intact upon receipt by lab? Yes

2.7 What was the sample cooler temperature upon receipt by lab? Temperatures ranged from 2.9 - 4.3 °C.

2.8 Additional comments:
Equipment blank was not collected because dedicated pumps were installed in each well at various times by contractors.

SECTION 3.0: HERBICIDES--METHOD SW3520/SW8150B

Name of reviewer(s) and review date: F. Eileen Roybal 15OCT98

LEVEL I AND II -- Data Validation

HOLDING TIMES

3.1 Were project-required analytical holding times met? yes √ no ____

(7-day limit from sample date to extraction date and 40-day limit from extraction date to analysis date for method SW8150)

[FG-ORG, p. 49-50]

sample date: 12AUG98 extraction date limit: 19AUG98

extraction date: 17AUG98 analysis date limit: 26SEP98

Samples were extracted by 17AUG98.

Samples were analyzed by 24AUG98 and met required holding times.

SURROGATE SPIKE RECOVERY

3.2 Did surrogate spike results meet frequency and QC acceptance criteria? yes √ no ____

(frequency: all samples and blanks: SW8150:%R varies)

[FG-ORG, p. 66-68]

All surrogate spike recovery results met QC acceptance criteria.

PROJECT REPORTING LIMIT

3.3 Did sample results meet project reporting limits? yes √ no ____

PRL's were not provided in SAP. Reporting limits were not raised for any of the samples.

FIELD DUPLICATES

3.4 Did field duplicate results meet frequency and QC acceptance criteria?yes √ no ____

(1 set per sampling period; RPD ≤ 30%)

Field duplicate results met QC acceptance criteria.

EQUIPMENT BLANKS

3.5 Did equipment blank results meet frequency and QC acceptance criteria? yes ____ no ____

(1 set for non-dedicated pump; target compound concentration ≤ RL)

[FG-ORG, p. 62-65]

N/A - See Comment 2.8.

LABORATORY CONTROL SAMPLES (LCSs)

3.6 Did LCS results meet frequency and QC acceptance criteria? yes √ no ____

(1 LCS per quarter; %R and RPD within 3 SD of historical results of lab performance)

[FG-ORG, p. 71-72]

LCS results met QC acceptance criteria.

LABORATORY METHOD BLANKS

3.7 Did method blank results meet frequency and QC acceptance criteria?yes √ no ____

(1 method blank per batch; concentration ≤ 2 times RL)

[FG-ORG, p. 62-65]

All method blank results were ND and met QC acceptance criteria.

MATRIX SPIKE AND MATRIX SPIKE DUPLICATE (MS/MSD)

3.8 Did MS/MSD results meet frequency and QC acceptance criteria? yes √ no ____

(1 set per quarter; %R and RPD limits varies)

[FG-ORG, p. 69-70]

MS/MSD results met QC acceptance criteria.

LEVEL II -- Data Validation

INSTRUMENT CALIBRATION

3.9 Did initial and continuing calibrations meet frequency and QC criteria? yes _____ no _____

[FG-ORG, p. 55-58]

Not reviewed

SAMPLE RESULT VERIFICATION

3.10 No omissions, problems, discrepancies, transcription errors, or reduction (dilution, conversion) errors in selected raw data? yes _____ no _____

Not reviewed

3.11 Additional comments: None.

SECTION 4.0: TOTAL ORGANIC CARBON (TOC)-- METHOD SW9060

Name of reviewer(s) and review date: F. Eileen Roybal 15OCT98

LEVEL I AND II -- Data Validation

HOLDING TIMES

4.1 Were project-required analytical holding times met? yes √ no ____

(28-day limit from sample date to analysis date for water samples)

[FG-ORG, p. 6-8]

sample date: 12AUG98 analysis date limit: 09SEP98

Samples were analyzed by 17AUG98 and met required holding times.

PROJECT REPORTING LIMIT (PRL)

4.2 Did sample results meet project reporting limits? yes √ no ____

(Quanterra RL: 1.0 mg/L)

PRL was not provided in SAP. Reporting limit was not raised on any of the samples for method SW9060.

FIELD DUPLICATES

4.3 Did field duplicate results meet frequency and QC acceptance criteria? yes √ no ____

(1 set per each sampling period; RPD <30 %)

Field duplicate resuts were within acceptance criteria.

EQUIPMENT BLANKS

4.4 Did equipment blank results meet frequency and QC acceptance criteria? yes ____ no ____

(1 set for non-dedicated pum; target compound concentration ≤ RL)

[FG-ORG, p. 20-25]

N/A - See Comment 2.8.

LABORATORY CONTROL SAMPLES (LCSs)

4.5 Did LCS results meet frequency and QC acceptance criteria? yes √ no ____

(1 LCS per batch; %R and RPD within 3 SD of historical results of Lab performance)

[FG-ORG, p. 32-33]

All LCS results were within acceptance criteria.

LABORATORY METHOD BLANK

4.6 Did method blank results meet frequency and QC acceptance criteria? yes √ no ____

(1 method blank per batch)

[FG-ORG, p. 20-25]

Laboratory method blank results were ND and met QC acceptance criteria.

MATRIX SPIKE AND MATRIX SPIKE DUPLICATE (MS/MSD)

4.7 Did MS/MSD results meet frequency and QC acceptance criteria? yes √ no ____

(1 set per quarter)

[FG-ORG, p. 30-31]

MS/MSD results met QC acceptance criteria.

LEVEL II -- Data Validation

INSTRUMENT CALIBRATION

4.8 Did initial and continuing calibrations meet frequency and QC criteria? yes ____ no ____

[FG-ORG, p. 12-16]

Not reviewed.

SAMPLE RESULT VERIFICATION

4.9 No omissions, problems, discrepancies, transcription errors, or reduction (dilution, conversion) errors in selected raw data? yes ____ no ____

Not reviewed.

4.10 Additional comments: Samples CAFB-I-1 and CAFB-I-2 had qualifier B which means that it is estimated and less than reporting limit.

SECTION 5.0: TOTAL ORGANIC HALOGENS (TOX) METHOD SW9020B

Name of reviewer(s) and review date: F. Eileen Roybal 15OCT98

LEVEL I AND II -- Data Validation

HOLDING TIMES

5.1 Were project-required analytical holding times met? yes √ no ____

(28-day limit from sample date to analysis date for water samples)

[FG-ORG, p. 6-8]

sample date: 12AUG98 analysis date limit: 09SEP98

Samples were analyzed by 02SEP98 and met required holding times.

PROJECT REPORTING LIMIT

5.2 Did sample results meet project reporting limits? yes √ no ____

(Quanterra RL: 30 µg/L)

PRL was not provided in SAP. Reporting limits were not raised for any of the samples for TOX analyses.

FIELD DUPLICATES

5.3 Did field duplicate results meet frequency and QC acceptance criteria? yes ____ no √

(1 set per each sampling period; RPD ≤ 30 %)

Field duplicate results did not meet QC acceptance criteria. RPD for TOX was 50%, but note that the TOX results are flaged with qualifier B which means that it is estimated and less than RL.

EQUIPMENT BLANKS

5.4 Did equipment blank results meet frequency and QC acceptance criteria? yes ____ no ____

(1 set for non-dedicated pump; target compound concentration ≤ RL)

[FG-ORG, p. 20-25]

N/A - See Comment 2.8.

LABORATORY CONTROL SAMPLES (LCSs)

5.5 Did LCS results meet frequency and QC acceptance criteria? yes √ no ____

(1 LCS per batch; %R within 80 to 120% and RPD < 20%)

[FG-ORG, p. 32-33]

LCS results met QC acceptance criteria.

LABORATORY METHOD BLANKS

5.6 Did method blank results meet frequency and QC acceptance criteria? yes √ no ____

(1 method blank per quarter)

[FG-ORG, p. 20-25]

Laboratory method blank results were ND and met QC acceptance criteria.

MATRIX SPIKE AND MATRIX SPIKE DUPLICATE (MS/MSD)

5.7 Did MS/MSD results meet frequency and QC acceptance criteria? yes √ no ____

(1 set per quarter; %R within 80 to 120 %; RPD < 20 %)

[FG-ORG, p. 30-31]

MS/MSD results met QC acceptance criteria.

LEVEL II -- Data Validation

INSTRUMENT CALIBRATION

5.8 Did initial and continuing calibrations meet frequency and QC criteria? yes ____ no ____

[FG-ORG, p. 12-16]

Not reviewed.

SAMPLE RESULT VERIFICATION

5.9 No omissions, problems, discrepancies, transcription errors, or reduction (dilution, conversion) errors in selected raw data? yes ____ no ____

Not reviewed.

5.10 Additional comments: All samples had qualifier B which means that it is estimated and less than reporting limit.

Appendix A -- Laboratory Data Validation Checklist

Instruction Notes for the Data Validation Checklist

This data validation checklist will be used when validating the chemical analytical results. Data validation is a systematic and independent verification of data quality and consists of checking, verifying, evaluating, and qualifying the chemical analytical results.

Two different levels of data validation are used with level I being not as detailed or as rigorous as level II. Level I data validation includes: (1) checking holding times limits, (2) evaluating the results of field and laboratory quality-control (QC) samples such as field replicates, matrix spikes, surrogate samples, and duplicate control samples, and (3) checking that contamination during sample processing has not occurred in QC blanks such as equipment, method, ambient, and trip blanks. Most of the information and data used to conduct a level I data validation is contained in the summary-data reports prepared by the reporting laboratory. Level II data validation includes all the level I guidelines plus using the raw-data reports prepared by the reporting laboratory to: (1) check that the laboratory instruments have been properly tuned and calibrated, and (2) verify that selected sample results do not have any omissions, problems, discrepancies, transcription errors, and reduction (dilution, conversion) errors.

Field samples (environmental and QC) are processed and analyzed by the reporting laboratory in specific groups of samples called sample projects (also called sample cases). A sample project usually consists of 20 or fewer samples that are collected from one or more sampling locations (monitoring well) in a given sampling period. Numerous laboratory QC samples also are analyzed with the field samples for each sample project.

This data validation checklist is designed to be used when validating the analytical results for a given sample project and it has a multi-level organization. The first part of the checklist contains general information (section 1.0) about the scope (who, when, how, and what) of the data validation and data reports and completeness (section 2.0) for each sample project. Sections 1.0 and 2.0 will be completed and included with all data validation checklists. The data validation checklist also contains numerous supplemental sections which are listed at the bottom of the first page of this document. These supplemental checklist sections are used for specific analytical methods and will be marked with a checkmark (√) when they are completed for a given sample project. Specific project-required frequency and QC acceptance criteria, and pertinent reference page numbers are listed with most of the checklist items. The major data-validation references are the USEPA guidance documents (USEPA 1994).

Checklist Abbreviations, Acronyms, and Notes

Abbreviations:

Al	aluminum
Ag	silver
As	arsenic
CAP	Chromic Acid Pit
CCV	continuing calibration verification
Cr	chromium
DCS	duplicate control sample
Ba	barium
Be	beryllium
Ca	calcium
Cd	cadmium
Cl	chloride
Co	cobalt
Conc.	concentration
Cu	copper
Diss.	dissolved
DRO	diesel range organics with GC/FID analysis C10-C28
DU	duplicate environmental sample
EB	equipment blank
Fe	iron
FG-INORG	Functional guidelines (EPA) for evaluating inorganic analyses
FG-ORG	Functional guidelines (EPA) for evaluating organic analyses
Fl	fluoride
GFAA	graphite furnace atomic absorption
Hg	mercury
ICP	inductively coupled plasma
ID	identification
IS	internal standards
J	estimated value qualifier
K	potassium
Mg	magnesium
mg/L	milligrams per liter
Mn	manganese
Mo	molybdenum
MS/MSD	matrix spike/matrix spike duplicate
MW	monitoring well
Na	sodium

Checklist Abbreviations, Acronyms, and Notes -- *continued*

Abbreviations:

Ni	nickel
NO_2	nitrate
NO_3	nitrite
PAC	Chromic Acid Pit duplicate sample identification
PAH	polynuclear aromatic hydrocarbons
Pb	lead
PO_4	orthophosphate
PRL	project reporting limit
QC	quality control
RCLs	Recovery Control Limits
RL	reporting limits
RMAL	Rocky Mountain Analytical Laboratory
RPD	relative percent difference
SA	environmental sample
SAP	Sampling and Analysis Plan
Sb	antimony
SCS	single control sample
Se	selenium
Sn	tin
SO_4	sulfate
SVOC	semivolatile organic compounds
TB	trip blank
TDS	total dissolved solids
TIC	tentatively identified compound
Tl	thallium
TOC	total organic carbon
Tot.	total
TOX	total organic halogen
TPH	total petroleum hydrocarbons
TSS	total suspended solids
USEPA	United States Environmental Protection Agency
USGS/WRD	United States Geological Survey, Water Resources Division
V	vanadium
VOC	volatile organic compounds
Zn	zinc
µg/L	microgram per liter

Checklist Abbreviations, Acronyms, and Notes -- *continued*

Abbreviations:

<	less than
>	greater than
%	percent
%R	percent recovery

USEPA, 1994, USEPA Contract laboratory program national functional guidelines for organic data review, February, 1994, Publication 9240.1-05, Document number PB94-963501, 124 p.

NOTE: this reference is abbreviated FG-ORG in this checklist.

USEPA, 1994, USEPA contract laboratory program national functional guidelines for inorganic data review, February, 1994, Publication 9240.1-05-01, Document number PB94-963502, 42 p.

NOTE: this reference is abbreviated FG-INORG in this checklist.

USGS, 1992, Laboratory data validation checklist: Wyoming District, U.S. Geological Survey checklist prepared for the U.S. Air Force, multiple pages.

DODEC LABORATORY DATA REVIEW WORKSHEET

1.0 GENERAL INFORMATION

DBH130197

Data reviewer: R Daddow
Date of review: Oct. 6, 1998
Sample project number: DBH130197
Project name: Cannon AFB LFS (4635- 36004)
Sample collection date: August 12, 1998
Sample matrix and number: 5 - water

Type and number of samples in project:

Type	Number
Environmental	3
Trip blank	
Equipment blank	
Ambient blank	
MS/MSD	2
Other	

INVOICE: OK

see attached copy

2.0 DATA REPORT

COPY FOR YOUR INFORMATION

Date of Analytical Results Report: 9/8/98
Number of volumes in Raw Data Report: 1
Raw Data Report reviewed? Yes _____ No X

OK

Were all analyses requested on the COC form performed by the laboratory?
Yes X No ____

If no, list canceled analyses and reason for non-performance:

Were the samples properly preserved upon receipt by the laboratory?
Yes X No ____

If no, list laboratory ID for samples that were not properly preserved.

3.0 ANALYTICAL METHODS

DBH130197

Analytical methods used in this project

_____	VOC by GC/MS (SW 8240, SW 8260, E524, E624)
_____	Halogenated VOC by GC (SW 8010)
_____	Aromatic VOC by GC (SW 8020)
_____	SVOC by GC/MS (SW 8270)
_____	PAH by HPLC (SW 8310)
_____	Organochlorine pesticides and PCB (SW 8080)
_____	Organophosphorous pesticides (SW 8140)
X	Chlorinated herbicides (SW 8150) 7/40 days
_____	Dioxins and Furans (SW 8280)
_____	Explosives (8330)
X	TOC (E415.1 or SW 9060) 28 days
_____	TPH (E418.1)
_____	Oil and Grease (E413.2)
X	TOX (SW 9020) 28 days
_____	ICP screen for metals (SW 6010)
_____	ICP/MS screen for metals (SW 6020)
_____	Trace ICP screen for metals (SW 6010 modified)
_____	Antimony by GFAA (SW 7041)
_____	Arsenic by GFAA (SW 7060)
_____	Chromium (SW 7191 or 7196)
_____	Lead by GFAA (SW 7421)
_____	Mercury by CVAA (SW 7470 or 7471)
_____	Selenium by GFAA (SW 7740)
_____	Thallium by GFAA (SW 7841)
_____	Inorganic anions (E300.0)
_____	Alkalinity (310.1)
_____	Cyanide, total and amenable (SW 9010/9012)
_____	Nitrogen, ammonia (E350.1)
_____	Nitrogen, TKN (E351.2)
_____	Nitrogen, nitrate (E353.2)
_____	Nitrogen, nitrate plus nitrite (E353.2)
_____	Nitrogen, nitrite (E354.1)
_____	Phosphorous, total or ortho (E365.3)
_____	Sulfate (E375.4)
_____	Sulfide (E376.2)
_____	TDS (E160.1)
_____	pH (SW 9040 or 9045)
_____	Percent moisture (D2216)
_____	Gross alpha and gross beta radioactivity (SW 9310)
_____	Alpha-emitting radium isotopes (SW 9315)
_____	Radium-228 (SW 9320)
_____	Uranium (908.1)
_____	Other analyses : _____

Were analytical holding times met? Yes X No _____

PBH 130197

If no, list analytical method and laboratory ID for samples that exceeded holding time:

_____
_____
_____
_____
_____
_____

Did surrogate recoveries meet QC acceptance criteria?
Yes X No _____

If no, list analytical method, laboratory ID, and surrogates that did not meet acceptance criteria:

_____
_____
_____
_____
_____

Did actual reporting limits meet project detection limits?
Organic analyses : Yes X No _____

If no, list analytical method, laboratory ID, and reason for non-conformance:

_____
_____
_____
_____
_____
_____

Inorganic analyses: Yes X No_____

Reporting limits for GFAA metals and inorganic anions may be raised when: (1) sample concentrations exceed the instrument linear range and (2) target analytes are subject to matrix interferences. Reporting limits for ICP metals and mercury by CVAA are typically only raised when the sample concentration exceeds the instrument linear range.

Did ~~DCS~~ LCS meet QC acceptance criteria? Yes X No_____

If no, list analytical method, laboratory ID, and reason for non-conformance:

_____
_____
_____
_____
_____
_____

DBH130197

Did SCS meet QC acceptance criteria? Yes _____ No_____

If no, list analytical method, laboratory ID, and reason for non-conformance:

NA

Were any target compounds found in the method, trip, equipment, or ambient blanks above the RL? Yes _____ No X

If yes, list the analytical method, laboratory ID, type of blank and compound:

Did the MS/MSD meet QC acceptance criteria? Yes X No_____

If no, list the analytical method, laboratory ID, and reason for non-conformance :

Were the MS/MSD associated with samples in this project? Yes X No_____

MS/MSD data are used to evaluate the effect of the sample matrix on the analytical process and should only be used in conjunction with other available laboratory QC information to evaluate precision and accuracy.

Additional comments:

QC DATA ASSOCIATION SUMMARY

D8H130197

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	WATER	SW846 9060		8229249	8229107
	WATER	SW846 8150B		8229252	8229105
	WATER	SW846 9020B		8246260	8246149
002	WATER	SW846 9060		8229249	8229107
	WATER	SW846 8150B		8229252	8229105
	WATER	SW846 9020B		8246260	8246149
003	WATER	SW846 9060		8229249	8229107
	WATER	SW846 8150B		8229252	8229105
	WATER	SW846 9020B		8246260	8246149

LABORATORY CONTROL SAMPLE DATA REPORT

GC Semivolatiles

Client Lot #...: D8H130197 **Work Order #...:** CKMKF102 **Matrix.....:** WATER
LCS Lot-Sample#: D8H170000-252
Prep Date.....: 08/17/98 **Analysis Date..:** 08/24/98
Prep Batch #...: 8229252 **Analysis Time..:** 22:03
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
2,4-D	**2.50**	**1.54**	**ug/L**	**62**	**SW846 8150B**
2,4,5-TP (Silvex)	**0.500**	**0.365**	**ug/L**	**73**	**SW846 8150B**
2,4,5-T	**0.500**	**0.262**	**ug/L**	**52**	**SW846 8150B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
DCAA	63	(44 - 107)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #...: D8H130197 **Work Order #...:** CKMKF102 **Matrix.....:** WATER
LCS Lot-Sample#: D8H170000-252
Prep Date.....: 08/17/98 **Analysis Date..:** 08/24/98
Prep Batch #...: 8229252 **Analysis Time..:** 22:03
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
2,4-D	**62**	**(35 - 92)**	**SW846 8150B**
2,4,5-TP (Silvex)	**73**	**(26 - 115)**	**SW846 8150B**
2,4,5-T	**52**	**(21 - 97)**	**SW846 8150B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
DCAA	63	(44 - 107)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #...: D8H130197
MB Lot-Sample #: D8H170000-252

Work Order #...: CKMKF101

Matrix.....: WATER

Prep Date.....: 08/17/98
Prep Batch #...: 8229252

Analysis Time..: 21:37

Analysis Date..: 08/24/98
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
2,4-D	ND	2.0	ug/L	SW846 8150B
2,4-DB	ND	5.0	ug/L	SW846 8150B
2,4,5-T	ND	0.50	ug/L	SW846 8150B
2,4,5-TP (Silvex)	ND	0.50	ug/L	SW846 8150B
Dalapon	ND	5.0	ug/L	SW846 8150B
Dicamba	ND	0.50	ug/L	SW846 8150B
Dichlorprop	ND	1.0	ug/L	SW846 8150B
Dinoseb	ND	1.0	ug/L	SW846 8150B
MCPA	ND	250	ug/L	SW846 8150B
MCPP	ND	250	ug/L	SW846 8150B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
CAA	58	(44 - 107)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE DATA REPORT

GC Semivolatiles

Client Lot #...: D8H130197
MS Lot-Sample #: D8H130197-003
Date Sampled...: 08/12/98 08:40
Prep Date.....: 08/17/98
Prep Batch #...: 8229252
Dilution Factor: 1

Work Order #...: CKK4Q104-MS
CKK4Q105-MSD
Date Received..: 08/13/98
Analysis Date..: 08/25/98
Analysis Time..: 00:11

Matrix.....: WATER

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCENT RECOVERY	RPD	METHOD
2,4-D	ND	2.43	1.79	ug/L	74		SW846 8150B
	ND	2.43	1.64	ug/L	67	8.8	SW846 8150B
2,4,5-T	ND	0.485	0.283	ug/L	58		SW846 8150B
	ND	0.485	0.266	ug/L	55	6.2	SW846 8150B
2,4,5-TP (Silvex)	ND	0.485	0.385	ug/L	79		SW846 8150B
	ND	0.485	0.342	ug/L	71	12	SW846 8150B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
DCAA	73	(44 - 107)
	68	(44 - 107)

OTE(S):

lculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #...: D8H130197 **Work Order #...:** CKK4Q104-MS **Matrix.....:** WATER
MS Lot-Sample #: D8H130197-003 CKK4Q105-MSD
Date Sampled...: 08/12/98 08:40 **Date Received..:** 08/13/98
Prep Date.....: 08/17/98 **Analysis Date..:** 08/25/98
Prep Batch #...: 8229252 **Analysis Time..:** 00:11
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
2,4-D	**74**	**(35 - 92)**			**SW846 8150B**
	67	**(35 - 92)**	**8.8**	**(0-27)**	**SW846 8150B**
2,4,5-T	**58**	**(21 - 97)**			**SW846 8150B**
	55	**(21 - 97)**	**6.2**	**(0-29)**	**SW846 8150B**
2,4,5-TP (Silvex)	**79**	**(26 - 115)**			**SW846 8150B**
	71	**(26 - 115)**	**12**	**(0-31)**	**SW846 8150B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
DCAA	73	(44 - 107)
	68	(44 - 107)

OTE(S):

lculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

General Chemistry

Client Lot #...: D8H130197 **Matrix.....:** WATER

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Halogens			Work Order #: CL83F102		LCS Lot-Sample#: D8I030000-260		
	100	95.7	ug/L	96	SW846 9020B	09/02/98	8246260
			Dilution Factor: 1				
			Analysis Time..: 10:23				
Total Organic Carbon			Work Order #: CKMK7102		LCS Lot-Sample#: D8H170000-249		
	25.0	25.2	mg/L	101	SW846 9060	08/17/98	8229249
			Dilution Factor: 1				
			Analysis Time..: 16:25				

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #...: D8H130197 **Matrix.....:** WATER

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
		Work Order #: CL83F102		LCS Lot-Sample#: D8I030000-260	
Total Organic Halogens	96	(84 - 110)	SW846 9020B	09/02/98	8246260
		Dilution Factor: 1			
		Analysis Time..: 10:23			
		Work Order #: CKMK7102		LCS Lot-Sample#: D8H170000-249	
Total Organic Carbon	101	(90 - 110)	SW846 9060	08/17/98	8229249
		Dilution Factor: 1			
		Analysis Time..: 16:25			

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

General Chemistry

Client Lot #...: D8H130197 **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Halogens		Work Order #: CL83F101		MB Lot-Sample #:	D8I030000-260	
	ND	30.0	ug/L	SW846 9020B	09/02/98	8246260
		Dilution Factor: 1				
		Analysis Time..: 10:23				
Total Organic Carbon		Work Order #: CKMK7101		MB Lot-Sample #:	D8H170000-249	
	ND	1.0	mg/L	SW846 9060	08/17/98	8229249
		Dilution Factor: 1				
		Analysis Time..: 16:25				

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE DATA REPORT

General Chemistry

Client Lot #...: D8H130197 **Matrix.....:** WATER
Date Sampled...: 08/12/98 08:40 **Date Received..:** 08/13/98

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Halogens			WO#: CKK4Q106-MS/CKK4Q107-MSD				MS Lot-Sample #: D8H130197-003		
	11.3	100	101	ug/L	90		SW846 9020B	09/02/98	8246260
	11.3	100	101	ug/L	89	0.26	SW846 9020B	09/02/98	8246260
			Dilution Factor: 1						
			Analysis Time..: 10:23						
Total Organic Carbon			WO#: CKK4Q108-MS/CKK4Q109-MSD				MS Lot-Sample #: D8H130197-003		
	ND	25.0	24.1	mg/L	96		SW846 9060	08/17/98	8229249
	ND	25.0	24.0	mg/L	96	0.24	SW846 9060	08/17/98	8229249
			Dilution Factor: 1						
			Analysis Time..: 16:25						

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #...: D8H130197 **Matrix.....:** WATER
Date Sampled...: 08/12/98 08:40 **Date Received..:** 08/13/98

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Halogens		WO#: CKK4Q106-MS/CKK4Q107-MSD				MS Lot-Sample #: D8H130197-003	
	90	(84 - 110)			SW846 9020B	09/02/98	8246260
	89	(84 - 110)	0.26	(0-13)	SW846 9020B	09/02/98	8246260
		Dilution Factor: 1					
		Analysis Time..: 10:23					
Total Organic Carbon		WO#: CKK4Q108-MS/CKK4Q109-MSD				MS Lot-Sample #: D8H130197-003	
	96	(90 - 110)			SW846 9060	08/17/98	8229249
	96	(90 - 110)	0.24	(0-10)	SW846 9060	08/17/98	8229249
		Dilution Factor: 1					
		Analysis Time..: 16:25					

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

U.S. GEOLOGICAL SURVEY, WATER RE 'RCES DIVISION, NEW MEXICO DISTRICT
ANALYTICAL REQUE /CHAIN OF CUSTODY

Project Name & Number: Cannon Air Force Base	PACKING AND SHIPPING DETAILS
Sampling Location: Landfill 5 groundwater sampling (463536004)	Packed and Sealed for Shipping by: Fred Gebhardt
Team Leader: Jerry Larson	Delivered to Shipper by: Jerry Larson
	Sampling Status: ☒ Done ☐ Continuing
	Seal Number: 135640
	Airbill Number: NA

Sample Date	Sample Time	Field Sample Number	Sample Type	No. of Containers	Analytical Methods (Parameters)	Remarks
08/12/98	1000	CAFB I-1	GROUND WATER	4	Chlorinated phenoxyacid herbicides by SW8150, TOX by SW9020, and TOC by SW9060	Environmental Samp.
"	1010	CAFB I-2	"	"	"	" "

Additional Comments

CHAIN OF CUSTODY RECORD				LABORATORY LOG-IN OF SAMPLE SHIPPING CONTAINER	
Relinquished by (signed)	Received by (signed)	Date	Time	Analytical Laboratory	Seal Intact upon Receipt: ☒ Yes ☐ No
Ralph Wilcox III	to Fed Ex	08/12/98	1700	Quanterra Environmental Lab 4955 Yarrow Street Arvada, CO 80002 ph: (303) 421-6611 Attention: Christina Mott	Condition of Contents: good
	Lynn Bierling				Contents Temperature: 2.9
					Laboratory Project Number: D8H130197

U.S. GEOLOGICAL SURVEY, WATER R URCES DIVISION, NEW MEXICO DISTRICT
ANALYTICAL REQU_T/CHAIN OF CUSTODY

Project Name & Number	PACKING AND SHIPPING DETAILS	
Cannon Air Force Base	Packed and Sealed for Shipping by: Fred Gebhardt	Seal Number: 135641
Sampling Location: Landfill 5 groundwater sampling (463536004)	Delivered to Shipper by: Jerry Larson	Airbill Number: 805971151862
Team Leader: Jerry Larson	Sampling Status: ☒ Done ☐ Continuing	

Sample Date	Sample Time	Field Sample Number	Sample Type	No. of Containers	Analytical Methods (Parameters)	Remarks
08/12/98	0840	CAFB Q-1	GROUND WATER	* 12	Chlorinated phenoxyacid herbicides by SW8150, TOX by SW9020, and TOC by SW9060	Environmental Samp. plus MS & MSD

Additional Comments

CHAIN OF CUSTODY RECORD				LABORATORY LOG-IN OF SAMPLE SHIPPING CONTAINER	
Relinquished by (signed)	Received by (signed)	Date	Time	Analytical Laboratory	Seal Intact upon Receipt: ☒ Yes ☐ No
Ralph Wilcox	to Fed Ex	08/12/98	1700	Quanterra Environmental Lab 4955 Yarrow Street Arvada, CO 80002 ph: (303) 421-6611 Attention: Christina Mott	Condition of Contents: good
					Contents Temperature: 4.3
					Laboratory Project Number: D8H B0 197

SAMPLE CHECKLIST

Lot #: D8H130197 Date/Time Received: 8-13-98 @ 0845

Company Name & Sampling Site: USGS | Cannon Air Force Base

Cooler #(s): 1 2

Temperatures: 2.9 4.3

Unpacking & Labeling Check Points:

N/A	Yes	No		Initials
	☑	☐	1. Radiation checked, record if reading > 0.5 mR/hr. (_____mR/hr)	
	☑	☐	2. Cooler seals intact.	
	☑	☐	3. Chain of custody present.	
	☐	☑	4. Bottles broken and/or are leaking, comment if yes.	
			PHOTOGRAPH BROKEN BOTTLES	
	☑	☐	5. Containers labeled, comment if no.	
	☑	☐	6. pH of all samples checked and meet requirements, note exceptions.	
	☑	☐	7. Chain of custody includes "received by" and "relinquished" by signatures, dates, and times.	
	☐	☑	8. Receipt date(s) > 48 hours past the collection date(s)? If yes, notify PA/PM.	
	☑	☐	9. Chain of custody agrees with bottle count, comment if no.	
	☑	☐	10. Chain of custody agrees with labels, comment if no.	
	☐	☐	11. VOA samples filled completely, comment if no.	
☑	☐	☐	12. VOA bottles preserved, check for labels.	
	☐	☑	13. Did samples require preservation with sodium thiosulfate?	
☑	☐	☐	14. If yes to #12, did the samples contain residual chlorine?	
☑	☐	☐	15. Sediment present in "D," dissolved, bottles.	
	☐	☑	16. Are analyses with short holding times requested?	
☐	☑	☐	17. Is extra sample volume provided for MS, MSD or matrix duplicates?	
	☐	☑	18. Multiphase samples present? If yes, comment below.	
	☐	☑	19. Any subsampling for volatiles? If yes, list samples.	
			PHOTOGRAPH MULTIPHASE SAMPLES	
☑	☐	☐	20. Clear picture taken, labeled, and stapled to project folder.	
☑	☐	☐	21. Subcontract COC signed and sent with samples to bottle prep?	
	☑	☐	22. Was sample labeling double checked?	

Comments: Include action taken to resolve discrepancies/problems. Include a hard copy of e-mail or use extra paper if more space is needed. _____

Initials: _____

APPENDIX III

Field Data

Sample container and preservation requirements

Parameters and methods	Bottle Size and Type	Preservatives
Herbicides SW8150	32 oz. glass	None, Chilled
Total Organic Carbon (TOC) SW9060	16 oz. glass	2 mL 50% Sulfuric Acid, Chilled, pH<2
Total Organic Halogen, (TOX), SW9020	8 oz. glass (amber)	1 mL 50% Sulfuric Acid, Chilled, pH<2

08-12-98 6

Field crew: Jerry Larson - Project supervisor & acting project chief
Fred Gebhardt - purging & sampling
Ralph Wilcox - purge measurements & notes

0730 Arrive @ Landfill 5 well Q (background well). Measured w.l. from top of steel well protect. w/ Solinst (ser. no. 10479) 282.23'. HNU - 0.0 ppm.

Calibrated field meters: pH (Orion 250A, serial no. 005268) @ 7.00 & 10.00 in automatic calibration mode, slope 92.6, buffer temp. 22.3°C; conductivity (Orion 126, serial no. 51449005) @ 1,000 µS/cm, std. lot no. 97245 expires 09-98.

Q

YSI
Ser # 92D038537
Atm pres. 658 mm Hg
w. temp 18°C
chart sat. 8.2 mg

time	vol.	temp.	pH	cond.	D.O.
0758	<1 gal	18.0°C	7.86	717 µS/cm	~~7.0 mg/L~~
0804	5	18.4	7.72	712	7.0 mg/L
0807	10	18.4	7.64	710	7.2
0813	15	18.4	7.63	713	7.4
0817	20	18.4	7.64	713	7.4
0822	25	18.4	7.64	713	7.4
0828	30	18.5	7.65	714	7.3
0833	35	18.4	7.65	712	7.3

0840 Collected environmental ground-water sample Q-1 plus MS & MSD.

0905 Arrive @ well I. HNU - 0.0 ppm. Measured WL w/ Solinst 290.09 ft from the top of the PVC pump hanger plate.

0912 Began purging well I.

time	vol.	temp.	pH	cond.	D.O.
0915	<1 gal	18.7°C	7.79	825 µS/cm	—
0920	5	18.8	7.82	809	6.8 mg/L
0924	10	18.8	7.73	814	7.1
0928	15	18.8	7.71	812	7.4
0932	20	18.7	7.72	819	7.4
0938	25	18.9	7.73	827	7.0
0946	30	19.0	7.72	813	9.0
0951	35	18.8	7.72	812	8.0
0957	40	18.8	7.84	812	13.5

Pres 658
w. temp 19°C
chart sat 8.8
Initial 7.8

Making air w/ water in discharge line

0958 Rechecked D.O. meter calibration @ 8.0 in chamber

1000 Collected environmental ground-water sample CAFB I-1

1010 Collected duplicate sample CAFB I-2.