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Cannon Air Force Base, New Mexico

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RCRA Ground-Water Monitoring at Landfill 5
EPA I.D. NM7572124454

Analytical Results of Samples Collected
August 10, 2000

HWB- CAFB- 01-001

Prepared for

United States Air Force Air Combat Command
Cannon Air Force Base

March 2001

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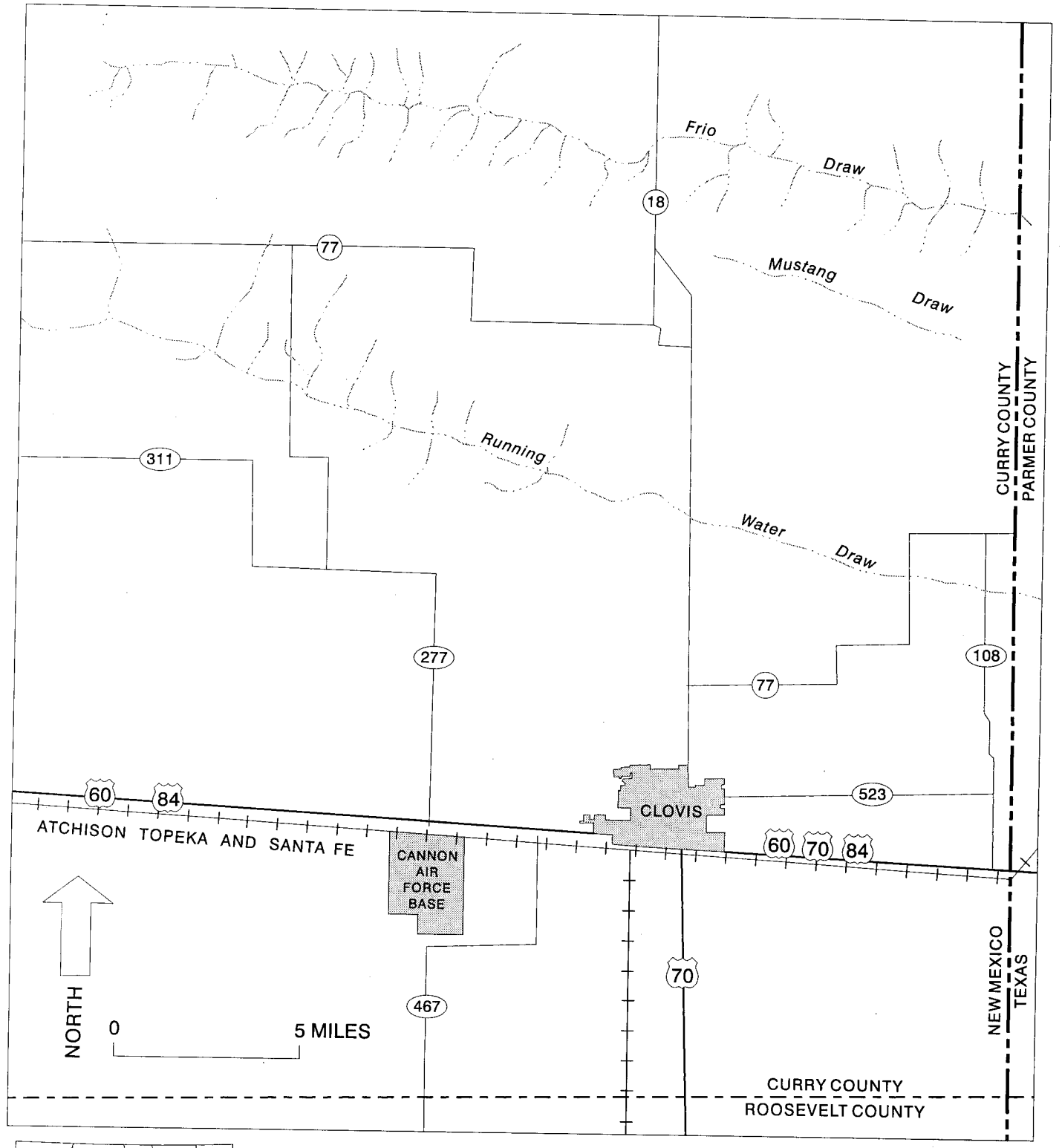
EXECUTIVE SUMMARY

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 7 miles west of Clovis, as shown in figure 1. The ground-water sampling is at Landfill 5 on the southeast corner of the base, as shown in figure 2. Detection sampling is conducted semiannually at Landfill 5 (fig. 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 seven monitoring wells around Landfill 5, CAFB, on August 10, 2000. The wells sampled at Landfill 5 are downgradient wells B, C, D, S, T, and U, and upgradient well Q, as shown in figure 3. These wells were sampled for the following Appendix IX parameters: VOC's by method SW8260B; total organic carbon (TOC) by SW9060, and total organic halogens (TOX) by SW9020B.

Concentrations of analytes detected in ground water from wells at Landfill 5 are presented in table 1. Trichloroethene was detected in a water samples from well D and C at a concentration of 1.3 μg/L and 1.4 μg/L, respectively. The USEPA MCL drinking-water standard for trichloroethene is 5 μg/L.

As part of the quality assurance and quality control (QA/QC) procedures for Landfill 5 sites, one trip blank and one field duplicate sample were collected. No target parameters were detected above reporting limits in the trip blanks. Duplicate sample CAFB-AA from well D had a concentration of 1.3 μg/L of trichloroethene, corresponding with the water sample from well D.



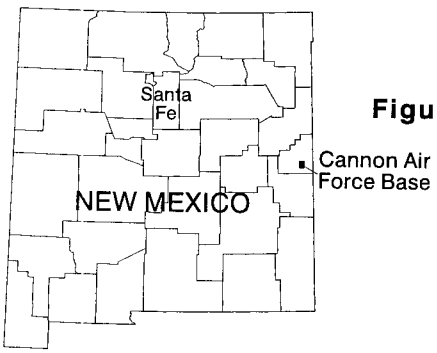


Figure 1. Location of Cannon Air Force Base, New Mexico.

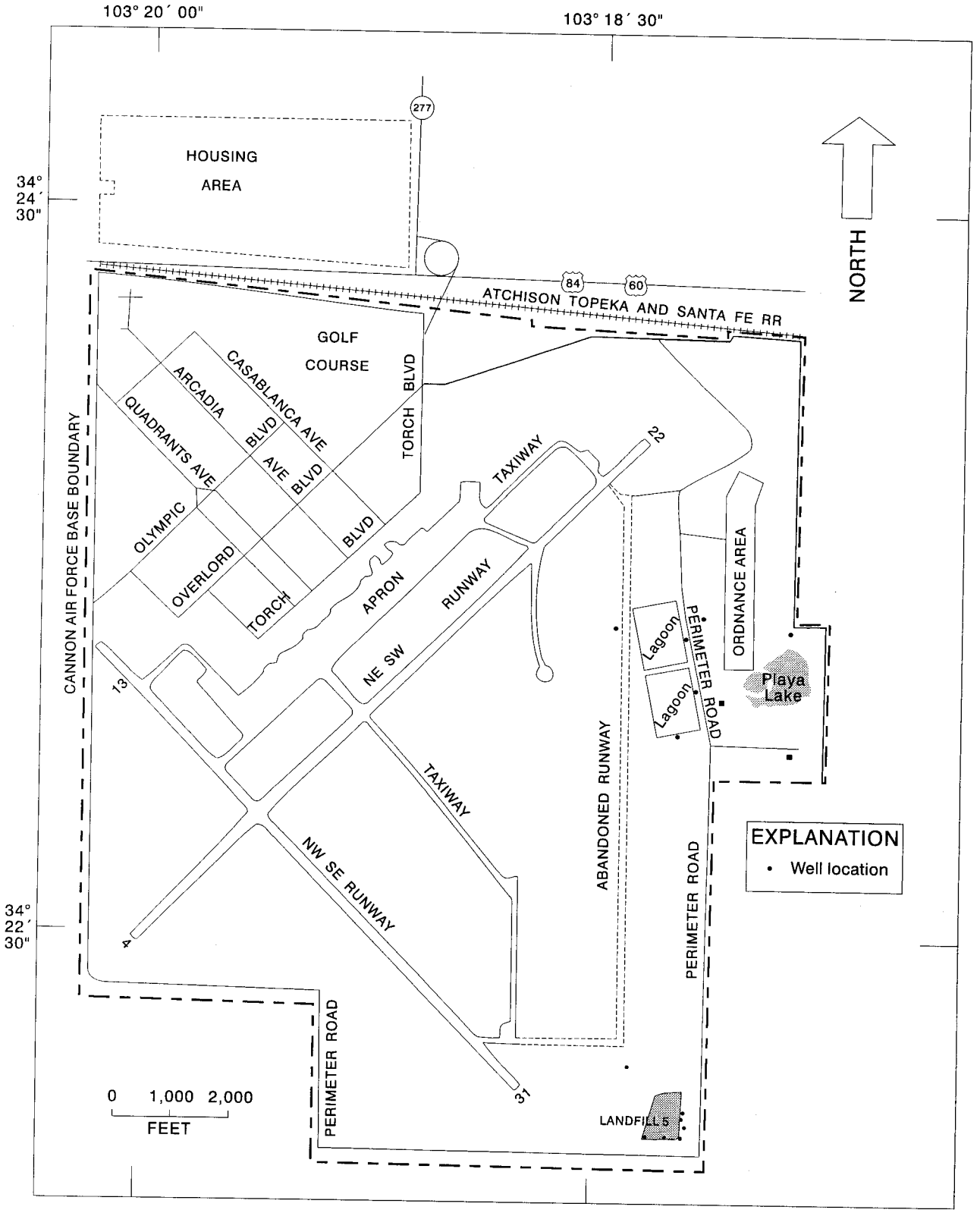


Figure 2. Cannon Air Force Base and location of sewage lagoons and Landfill 5.

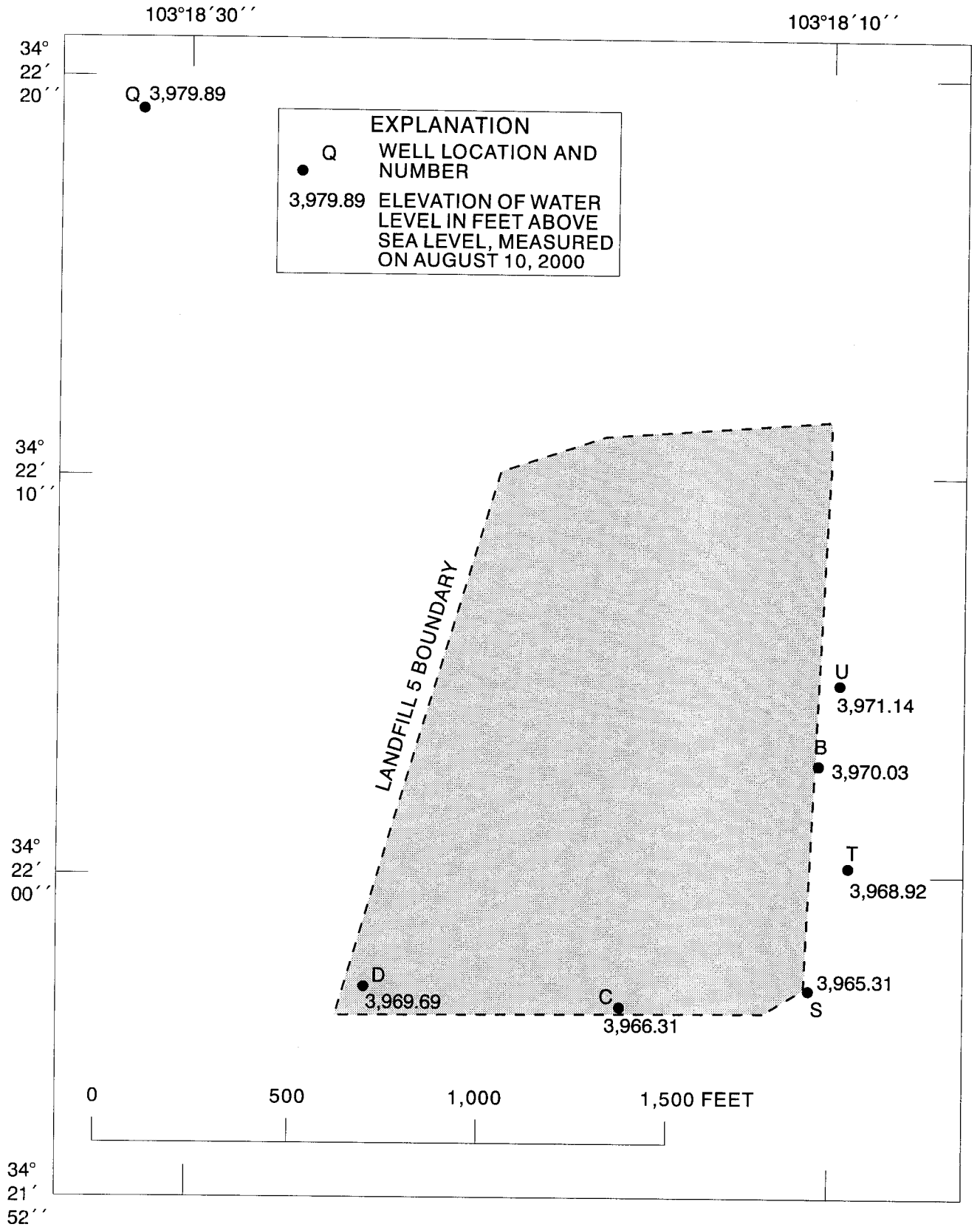


Figure 3. Location of monitoring wells around Landfill 5.

Table 1.--Summary of concentrations of analytes in ground water from monitoring wells CAFB-B, C, D, Q, S, T, and U for samples collected August 10, 2000, at Landfill 5, Cannon Air Force Base, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; ND, not detected; J, result was detected below the reporting limit or is an estimated concentration. All samples were prepared or analyzed after the EPA-recommended temperature had been exceeded]

Well/sample ID: Date sampled:	B/CAFB-B 8-10-2000		C/CAFB-C 8-10-2000		D/CAFB-D 8-10-2000		D/CAFB-AA 8-10-2000 Duplicate	
Analytes and Methods	Results	RL	Results	RL	Results	RL	Results	RL
Appendix-IX Volatiles, SW8260B (µg/L)								
Trichloroethene	ND	1.0	1.4	1.0	1.3	1.0	1.3	1.0
Bromoform	ND	1.0	ND	1.0	0.45 J	1.0	ND	1.0
Appendix-IX								
TOC, SW846 9060 (mg/L)	ND	1.0	ND	1.0	0.48 B	1.0	0.46 B	1.0
TOX, SW846 9020B (µg/L)	ND	30.0	5.7 B	30.0	ND	30.0	ND	30.0

Well/sample ID: Date sampled:	Q/CAFB-Q 8-10-2000		S/CAFB-S 8-10-2000		T/CAFB-T 8-10-2000		U/CAFB-U 8-10-2000	
Analytes and Methods	Result	RL	Result	RL	Result	RL	Result	RL
Appendix-IX Volatiles, SW8260B (µg/L)								
Trichloroethene	ND	1.0	ND	1.0	ND	1.0	ND	1.0
Bromoform	ND	1.0	ND	1.0	ND	1.0	ND	1.0
Appendix-IX								
TOC, SW846 9060 (mg/L)	0.51 B	1.0	ND	1.0	ND	1.0	ND	1.0
TOX, SW846 9020B (µg/L)	2.9 B	30.0	ND	30.0	3.0	30.0	ND	30.0

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 B -- Landfill-5

WELL LOCATION (LONGITUDE) 103 ° 18 ' 10 "

WELL LOCATION (LATITUDE) 34 ° 22 ' 03 "

AQUIFER NAME Ogallala

AQUIFER CONFINED _____ UNCONFINED X

WELL INSTALLATION DATE 11-30-1984

DRILLING METHOD HYDRT

INNER CASING DIAMETER 4 inches

BOREHOLE DIAMETER 8 inches

CASING MATERIAL PVC

METHOD OF DEVELOPMENT AIRFT

ELEV BOTTOM OF BOREHOLE 3903.11 feet above MSL

ELEV BOTTOM OF WELL CASING 3903.11 feet above MSL

ELEV BOTTOM OF SCREENED INT 3903.11 feet above MSL

ELEV OF TOP OF SCREENED INT 3918.11 feet above MSL

SURVEYED ELEV OF CASING TOP 4265.41 feet above MSL

DATE OF REPORT 03-15-01 SIGNATURE Fredrick E. Gebhardt

NAME (TYPED) Fredrick E. Gebhardt

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 C -- Landfill-5

WELL LOCATION (LONGITUDE) 103° 18' 08.3"

WELL LOCATION (LATITUDE) 34° 21' 56.8"

AQUIFER NAME Ogalalla

AQUIFER CONFINED _____ UNCONFINED X

WELL INSTALLATION DATE 01-11-1985

DRILLING METHOD HYDRT

INNER CASING DIAMETER 4 inches

BOREHOLE DIAMETER 8 inches

CASING MATERIAL PVC

METHOD OF DEVELOPMENT AIRFT

ELEV BOTTOM OF BOREHOLE 3905.90 feet above MSL

ELEV BOTTOM OF WELL CASING 3905.90 feet above MSL

ELEV BOTTOM OF SCREENED INT 3905.90 feet above MSL

ELEV OF TOP OF SCREENED INT 3920.90 feet above MSL

SURVEYED ELEV OF CASING TOP 4267.90 feet above MSL

DATE OF REPORT 03-15-01 SIGNATURE Fredrick E. Gebhardt

NAME (TYPED) Fredrick E. Gebhardt

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 D -- Landfill-5

WELL LOCATION (LONGITUDE) 103 ° 18 ' 17 "

WELL LOCATION (LATITUDE) 34 ° 21 ' 57 "

AQUIFER NAME Ogallala

AQUIFER CONFINED _____ UNCONFINED X

WELL INSTALLATION DATE 12-16-1984

DRILLING METHOD HYDRT

INNER CASING DIAMETER 4 inches

BOREHOLE DIAMETER 8 inches

CASING MATERIAL PVC

METHOD OF DEVELOPMENT AIRFT

ELEV BOTTOM OF BOREHOLE 3909.15 feet above MSL

ELEV BOTTOM OF WELL CASING 3909.15 feet above MSL

ELEV BOTTOM OF SCREENED INT 3909.15 feet above MSL

ELEV OF TOP OF SCREENED INT 3924.15 feet above MSL

SURVEYED ELEV OF CASING TOP 4265.90 feet above MSL

DATE OF REPORT 03-15-01 SIGNATURE Fredrick E. Gebhardt

NAME (TYPED) Fredrick E. Gebhardt

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 -- Landfill-5

WELL LOCATION (LONGITUDE) 103° 18' 31"

WELL LOCATION (LATITUDE) 34° 22' 19"

AQUIFER NAME Ogallala

AQUIFER CONFINED _____ UNCONFINED X

WELL INSTALLATION DATE 02-24-1996

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 feet above MSL

ELEV BOTTOM OF WELL CASING 3,970.30 feet above MSL

ELEV BOTTOM OF SCREENED INT 3,970.30 feet above MSL

ELEV OF TOP OF SCREENED INT 4,000.30 feet above MSL

SURVEYED ELEV OF CASING TOP 4,266.89 feet above MSL

DATE OF REPORT 03-15-01 SIGNATURE Fredrick E. Gebhardt

NAME (TYPED) Fredrick E. Gebhardt

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 S -- Landfill-5

WELL LOCATION (LONGITUDE) 103 ° 18 ' 10.58 "

WELL LOCATION (LATITUDE) 34 ° 21 ' 57.02 "

AQUIFER NAME Ogallala

AQUIFER CONFINED _____ UNCONFINED X

WELL INSTALLATION DATE 12 -02 to 06 -1998

DRILLING METHOD HYDRT (mud rotary)

INNER CASING DIAMETER 4 inches

BOREHOLE DIAMETER 12 inches

CASING MATERIAL PVC (Schedule-80)

METHOD OF DEVELOPMENT BAILD

ELEV BOTTOM OF BOREHOLE 3898.83 feet above MSL

ELEV BOTTOM OF WELL CASING 3898.83 feet above MSL

ELEV BOTTOM OF SCREENED INT 3939.81 feet above MSL

ELEV OF TOP OF SCREENED INT 3979.83 feet above MSL

SURVEYED ELEV OF CASING TOP 4263.83 feet above MSL

DATE OF REPORT 03-15-01 SIGNATURE Fredrick E. Gebhardt

NAME (TYPED) Fredrick E. Gebhardt

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 T -- Landfill-5

WELL LOCATION (LONGITUDE) 103 ° 18 ' 09.33 "

WELL LOCATION (LATITUDE) 34 ° 22 ' 00.10 "

AQUIFER NAME Ogallala

AQUIFER CONFINED _____ UNCONFINED X

WELL INSTALLATION DATE 12 -6 to 10 -1998

DRILLING METHOD HYDRT (mud rotary)

INNER CASING DIAMETER 4 inches

BOREHOLE DIAMETER 12 inches

CASING MATERIAL PVC (Schedule-80)

METHOD OF DEVELOPMENT BAILD

ELEV BOTTOM OF BOREHOLE 3898.69 feet above MSL

ELEV BOTTOM OF WELL CASING 3898.69 feet above MSL

ELEV BOTTOM OF SCREENED INT 3939.69 feet above MSL

ELEV OF TOP OF SCREENED INT 3979.69 feet above MSL

SURVEYED ELEV OF CASING TOP 4263.69 feet above MSL

DATE OF REPORT 03-15-01 SIGNATURE Fredrick E. Gebhardt

NAME (TYPED) Fredrick E. Gebhardt

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 U -- Landfill-5

WELL LOCATION (LONGITUDE) 103 ° 18 ' 09.84 "

WELL LOCATION (LATITUDE) 34 ° 22 ' 04.88 "

AQUIFER NAME Ogallala

AQUIFER CONFINED _____ UNCONFINED X

WELL INSTALLATION DATE 12 -10 to 13 -1998

DRILLING METHOD HYDRT (mud rotary)

INNER CASING DIAMETER 4 inches

BOREHOLE DIAMETER 12 inches

CASING MATERIAL PVC (Schedule-80)

METHOD OF DEVELOPMENT BAILD

ELEV BOTTOM OF BOREHOLE 3900.26 feet above MSL

ELEV BOTTOM OF WELL CASING 3900.26 feet above MSL

ELEV BOTTOM OF SCREENED INT 3941.26 feet above MSL

ELEV OF TOP OF SCREENED INT 3981.26 feet above MSL

SURVEYED ELEV OF CASING TOP 4265.26 feet above MSL

DATE OF REPORT 03-15-01 SIGNATURE Fredrick E. Gebhardt

NAME (TYPED) Fredrick E. Gebhardt

MONITORING WELL
SEMI-ANNUAL SAMPLING REPORT

SAMPLE COLLECTED BY Fredrick E. Gebhardt

LABORATORY NAME Severn Trent Services WELL NUMBER CAFB-B

WELL DEPTH 362.30 feet WELL CASING VOLUME 43.63 gallons

DATE SAMPLED 08-10-2000 LABORATORY SAMPLE I.D.# D0H110213-008

TIME SAMPLED 1345 DATE RECEIVED BY LAB 08-11-2000

PARAMETERS	STORET CODE	UNITS	VALUE	DATE
Elevation of G. Water	71993	ft.	3970.03	08-10-2000
Flow Rate	00059	gal/min	0.93	08-10-2000
Pump Period	72004	min.	28	08-10-2000
Volume Evacuated	73675	gal	30.0	08-10-2000
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.	7.60	N/A	08-10-2000	field electrometer
Specific Conductivity	00095	umhos/cm	783	N/A	08-10-2000	field electrometer
T.O.X.	70354	ug/L	ND	30.0	08-30-2000	SW9020B
T.O.C.	00680	mg/L	ND	1.0	08-30-2000	SW9060

SIGNATURE: Fredrick E. Gebhardt

NAME (PRINTED): Fredrick E. Gebhardt

MONITORING WELL
SEMI-ANNUAL SAMPLING REPORT

SAMPLE COLLECTED BY Fredrick E. Gebhardt

LABORATORY NAME Severn Trent Services WELL NUMBER CAFB-C

WELL DEPTH 362.00 feet WELL CASING VOLUME 39.3 gallons

DATE SAMPLED 08-10-2000 LABORATORY SAMPLE I.D.# D0H110213-003

TIME SAMPLED 1045 DATE RECEIVED BY LAB 08-11-2000

PARAMETERS	STORET CODE	UNITS	VALUE	DATE
Elevation of G. Water	71993	ft.	3966.15	08-10-2000
Flow Rate	00059	gal/min	0.88	08-10-2000
Pump Period	72004	min.	35.0	08-10-2000
Volume Evacuated	73675	gal	40.0	08-10-2000
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.	7.66	N/A	08-10-2000	field electrometer
Specific Conductivity	00095	umhos/cm	608	N/A	08-10-2000	field electrometer
T.O.X.	70354	ug/L	5.7B	30.0	08-30-2000	SW9020B
T.O.C.	00680	mg/L	ND	1.0	08-30-2000	SW9060

SIGNATURE: Fredrick E. Gebhardt

NAME (PRINTED): Fredrick. Gebhardt

MONITORING WELL
SEMI-ANNUAL SAMPLING REPORT

SAMPLE COLLECTED BY Fredrick E. Gebhardt

LABORATORY NAME Severn Trent Services WELL NUMBER CAFB-D

WELL DEPTH 354.87 feet WELL CASING VOLUME 39.47 gallons

DATE SAMPLED 08-10-2000 LABORATORY SAMPLE I.D.# D0H110213-001

TIME SAMPLED 0935 DATE RECEIVED BY LAB 08-11-2000

PARAMETERS	STORET CODE	UNITS	VALUE	DATE
Elevation of G. Water	71993	ft.	3969.69.	08-10-2000
Flow Rate	00059	gal/min	0.98	08-10-2000
Pump Period	72004	min.	39.0	08-10-2000
Volume Evacuated	73675	gal	40.0	08-10-2000
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.	7.50	N/A	08-10-2000	field electrometer
Specific Conductivity	00095	umhos/cm	587	N/A	08-10-2000	field electrometer
T.O.X.	70354	ug/L	ND	30.0	08-30-00	SW9020B
T.O.C.	00680	mg/L	0.48B	1.0	08-30-00	SW9060

SIGNATURE: Fredrick E. Gebhardt

NAME (PRINTED): Fredrick E. Gebhardt

MONITORING WELL
SEMI-ANNUAL SAMPLING REPORT

SAMPLE COLLECTED BY Fredrick E. Gebhardt

LABORATORY NAME Severn Trent Services WELL NUMBER CAFB-Q

WELL DEPTH 296.69 feet WELL CASING VOLUME 6.90 gallons

DATE SAMPLED 08-10-2000 LABORATORY SAMPLE I.D.# D0H110213-005

TIME SAMPLED 0830 DATE RECEIVED BY LAB 08-11-2000

PARAMETERS	STORET CODE	UNITS	VALUE	DATE
Elevation of G. Water	71993	ft.	3979.89	08-10-2000
Flow Rate	00059	gal/min	0.83	08-10-2000
Pump Period	72004	min.	25	08-10-2000
Volume Evacuated	73675	gal	30	08-10-2000
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.	7.57	N/A	08-10-2000	field electrometer
Specific Conductivity	00095	umhos/cm	734	N/A	08-10-2000	field electrometer
T.O.X.	70354	ug/L	2.9 B	30.0	08-30-2000	SW9020B
T.O.C.	00680	mg/L	0.51 B	1.0	08-30-2000	SW9060

SIGNATURE: Fredrick E. Gebhardt

NAME (PRINTED): Fredrick E. Gebhardt

MONITORING WELL
SEMI-ANNUAL SAMPLING REPORT

SAMPLE COLLECTED BY Fredrick E. Gebhardt

LABORATORY NAME Severn Trent Services WELL NUMBER CAFB-S

WELL DEPTH 362.77 feet WELL CASING VOLUME 43.3 gallons

DATE SAMPLED 08-10-2000 LABORATORY SAMPLE I.D.# D0H110213-006

TIME SAMPLED 1140 DATE RECEIVED BY LAB 08-11-2000

PARAMETERS	STORET CODE	UNITS	VALUE	DATE
Elevation of G. Water	71993	ft.	3965.31	08-10-2000
Flow Rate	00059	gal/min	0.86	08-10-2000
Pump Period	72004	min.	35	08-10-2000
Volume Evacuated	73675	gal	30.0	08-10-2000
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	08-10-2000	field electrometer
Specific Conductivity	00095	umhos/cm	768	N/A	08-10-2000	field electrometer
T.O.X.	70354	ug/L	ND	30.0	08-30-2000	SW9020B
T.O.C.	00680	mg/L	ND	1.0	08-30-2000	SW9060

SIGNATURE: Fredrick E. Gebhardt

NAME (PRINTED): Fredrick E. Gebhardt

MONITORING WELL
SEMI-ANNUAL SAMPLING REPORT

SAMPLE COLLECTED BY Fredrick E. Gebhardt

LABORATORY NAME Severn Trent Services WELL NUMBER CAFB-T

WELL DEPTH 365.00 feet WELL CASING VOLUME 45.8 gallons

DATE SAMPLED 08-10-2000 LABORATORY SAMPLE I.D.# D0H110213-007

TIME SAMPLED 1300 DATE RECEIVED BY LAB 08-11-2000

PARAMETERS	STORET CODE	UNITS	VALUE	DATE
Elevation of G. Water	71993	ft.	3968.92	08-10-2000
Flow Rate	00059	gal/min	0.63	08-10-2000
Pump Period	72004	min.	40.0	08-10-2000
Volume Evacuated	73675	gal	25.0	08-10-2000
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	08-10-2000	field electrometer
Specific Conductivity	00095	umhos/cm	819	N/A	08-10-2000	field electrometer
T.O.X.	70354	ug/L	3.0 B	30.0	08-30-2000	SW9020B
T.O.C.	00680	mg/L	ND	1.0	08-30-2000	SW9060

SIGNATURE: Fredrick E. Gebhardt

NAME (PRINTED): Fredrick E. Gebhardt

MONITORING WELL
SEMI-ANNUAL SAMPLING REPORT

SAMPLE COLLECTED BY Fredrick E. Gebhardt

LABORATORY NAME Severn Trent Services WELL NUMBER CAFB-U

WELL DEPTH 365.00 feet WELL CASING VOLUME 46.2 gallons

DATE SAMPLED 08-10-2000 LABORATORY SAMPLE I.D.# D0H110213-009

TIME SAMPLED 1430 DATE RECEIVED BY LAB 08-11-2000

PARAMETERS	STORET CODE	UNITS	VALUE	DATE
Elevation of G. Water	71993	ft.	3971.14	08-10-2000
Flow Rate	00059	gal/min	0.83	08-10-2000
Pump Period	72004	min.	25.0	08-10-2000
Volume Evacuated	73675	gal	30.0	08-10-2000
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.	7.90	N/A	08-10-2000	field electrometer
Specific Conductivity	00095	umhos/cm	772	N/A	08-10-2000	field electrometer
T.O.X.	70354	ug/L	ND	30.0	08-30-2000	SW9020B
T.O.C.	00680	mg/L	ND	1.0	08-30-2000	SW9060

SIGNATURE: Fredrick E. Gebhardt

NAME (PRINTED): Fredrick E. Gebhardt

APPENDIX I

Analytical Results from Severn Trent Services Laboratory
for Ground-Water Samples Collected August 10, 2000

SEVERN TRENT SERVICES

STL Denver
4955 Yarrow Street
Arvada, CO 80002-4517

Tel: 303 736 0100
Fax: 303 431 7171
www.stl-inc.com

ANALYTICAL REPORT

Cannon AFB – Landfill 5
Lot #: D0H110213

Richard Daddow

U.S. Geological Survey

STL DENVER

Karen Kuoppala
Project Manager

September 1, 2000

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Case Narrative
Lot D0H110213

With exceptions noted as flags or footnotes, 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.

This report contains the results for the 9 samples received under chain of custody on August 11, 2000.

EXECUTIVE SUMMARY - Detection Highlights

D0H110213

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
CAFB-D 08/10/00 09:35 001				
Bromoform	0.45 J	1.0	ug/L	SW846 8260B
Trichloroethene	1.3	1.0	ug/L	SW846 8260B
Total Organic Carbon	0.48 B	1.0	mg/L	SW846 9060
CAFB-AA 08/10/00 09:45 002				
Trichloroethene	1.3	1.0	ug/L	SW846 8260B
Total Organic Carbon	0.46 B	1.0	mg/L	SW846 9060
CAFB-C 08/10/00 10:45 003				
Trichloroethene	1.4	1.0	ug/L	SW846 8260B
Total Organic Halogens	5.7 B	30.0	ug/L	SW846 9020B
CAFB-Q 08/10/00 09:50 005				
Total Organic Carbon	0.51 B	1.0	mg/L	SW846 9060
Total Organic Halogens	2.9 B	30.0	ug/L	SW846 9020B
CAFB-T 08/10/00 13:00 007				
Total Organic Halogens	3.0 B	30.0	ug/L	SW846 9020B

METHODS SUMMARY

D0H110213

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Total Organic Carbon	SW846 9060	SW846 9060
Total Organic Halogens	SW846 9020B	SW846 9020B
Volatile Organics by GC/MS	SW846 8260B	SW846 5030B/826

References:

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

METHOD / ANALYST SUMMARY

D0H110213

ANALYTICAL METHOD	ANALYST	ANALYST ID
SW846 8260B	Dan Appelhans	001008
SW846 9020B	Duane Allee	001470
SW846 9060	Duane Allee	001470

References:

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

SAMPLE SUMMARY

D0H110213

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DHQ1K	001	CAFB-D	08/10/00	09:35
DHQ25	002	CAFB-AA	08/10/00	09:45
DHQ26	003	CAFB-C	08/10/00	10:45
DHQ28	004	CAFB-D-TB	08/10/00	09:50
DHQ2E	005	CAFB-Q	08/10/00	09:50
DHQ2H	006	CAFB-S	08/10/00	11:40
DHQ2N	007	CAFB-T	08/10/00	13:00
DHQ2Q	008	CAFB-B	08/10/00	13:45
DHQ2R	009	CAFB-U	08/10/00	14:30

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-D

GC/MS Volatiles

Lot-Sample #...: D0H110213-001 **Work Order #...:** DHQ1K101 **Matrix.....:** WATER
Date Sampled...: 08/10/00 09:35 **Date Received..:** 08/11/00
Prep Date.....: 08/16/00 **Analysis Date..:** 08/16/00
Prep Batch #...: 0230378 **Analysis Time..:** 21:35
Dilution Factor: 1

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acetone	ND	10	ug/L
Acetonitrile	ND	20	ug/L
Acrylonitrile	ND	20	ug/L
Benzene	ND	1.0	ug/L
Bromodichloromethane	ND	1.0	ug/L
Bromoform	**0.45 J**	**1.0**	**ug/L**
Bromomethane	ND	2.0	ug/L
Carbon disulfide	ND	1.0	ug/L
Carbon tetrachloride	ND	1.0	ug/L
Chlorobenzene	ND	1.0	ug/L
Chloroprene	ND	1.0	ug/L
Dibromochloromethane	ND	1.0	ug/L
Chloroethane	ND	2.0	ug/L
Chloroform	ND	1.0	ug/L
Chloromethane	ND	2.0	ug/L
Allyl chloride	ND	2.0	ug/L
Dibromomethane	ND	1.0	ug/L
trans-1,4-Dichloro-2-butene	ND	1.0	ug/L
Dichlorodifluoromethane	ND	2.0	ug/L
1,1-Dichloroethane	ND	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
1,1-Dichloroethene	ND	1.0	ug/L
cis-1,2-Dichloroethene	ND	1.0	ug/L
trans-1,2-Dichloroethene	ND	0.50	ug/L
1,2-Dichloroethene (total)	ND	1.0	ug/L
1,2-Dichloropropane	ND	1.0	ug/L
cis-1,3-Dichloropropene	ND	1.0	ug/L
trans-1,3-Dichloropropene	ND	1.0	ug/L
1,4-Dioxane	ND	200	ug/L
Ethylbenzene	ND	1.0	ug/L
Trichlorofluoromethane	ND	2.0	ug/L
2-Hexanone	ND	5.0	ug/L
Iodomethane	ND	1.0	ug/L
Isobutyl alcohol	ND	50	ug/L
Methacrylonitrile	ND	10	ug/L
Methylene chloride	ND	1.0	ug/L

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US GEOLOGICAL SURVEY

Client Sample ID: CAFB-D

GC/MS Volatiles

Lot-Sample #...: D0H110213-001 **Work Order #...:** DHQ1K101 **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl methacrylate	ND	1.0	ug/L
4-Methyl-2-pentanone	ND	5.0	ug/L
Propionitrile	ND	4.0	ug/L
Styrene	ND	1.0	ug/L
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L
Tetrachloroethene	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
1,1,1-Trichloroethane	ND	1.0	ug/L
1,1,2-Trichloroethane	ND	1.0	ug/L
Trichloroethene	**1.3**	**1.0**	**ug/L**
1,2,3-Trichloropropane	ND	1.0	ug/L
Vinyl acetate	ND	2.0	ug/L
Vinyl chloride	ND	2.0	ug/L
Xylenes (total)	ND	1.0	ug/L
1,2-Dibromo-3-chloropropane (DBCP)	ND	2.0	ug/L
1,2-Dibromoethane (EDB)	ND	1.0	ug/L
2-Butanone (MEK)	ND	5.0	ug/L
Acrolein	ND	20	ug/L
Ethyl methacrylate	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	101	(82 - 122)
1,2-Dichloroethane-d4	98	(78 - 123)
4-Bromofluorobenzene	101	(80 - 120)
Toluene-d8	100	(82 - 122)

NOTE(S):

J Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

CAFB-D

GC/MS Volatiles

Lot-Sample #: D0H110213-001 **Work Order #:** DHQ1K101 **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT	RETENTION TIME	UNITS
None				ug/L

US GEOLOGICAL SURVEY

Client Sample ID: CAFB-AA

GC/MS Volatiles

Lot-Sample #...: D0H110213-002 **Work Order #...:** DHQ25101 **Matrix.....:** WATER
Date Sampled...: 08/10/00 09:45 **Date Received..:** 08/11/00
Prep Date.....: 08/16/00 **Analysis Date..:** 08/16/00
Prep Batch #...: 0230378 **Analysis Time..:** 21:59
Dilution Factor: 1

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acetone	ND	10	ug/L
Acetonitrile	ND	20	ug/L
Acrylonitrile	ND	20	ug/L
Benzene	ND	1.0	ug/L
Bromodichloromethane	ND	1.0	ug/L
Bromoform	ND	1.0	ug/L
Bromomethane	ND	2.0	ug/L
Carbon disulfide	ND	1.0	ug/L
Carbon tetrachloride	ND	1.0	ug/L
Chlorobenzene	ND	1.0	ug/L
Chloroprene	ND	1.0	ug/L
Dibromochloromethane	ND	1.0	ug/L
Chloroethane	ND	2.0	ug/L
Chloroform	ND	1.0	ug/L
Chloromethane	ND	2.0	ug/L
Allyl chloride	ND	2.0	ug/L
Dibromomethane	ND	1.0	ug/L
trans-1,4-Dichloro-2-butene	ND	1.0	ug/L
Dichlorodifluoromethane	ND	2.0	ug/L
1,1-Dichloroethane	ND	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
1,1-Dichloroethene	ND	1.0	ug/L
cis-1,2-Dichloroethene	ND	1.0	ug/L
trans-1,2-Dichloroethene	ND	0.50	ug/L
1,2-Dichloroethene (total)	ND	1.0	ug/L
1,2-Dichloropropane	ND	1.0	ug/L
cis-1,3-Dichloropropene	ND	1.0	ug/L
trans-1,3-Dichloropropene	ND	1.0	ug/L
1,4-Dioxane	ND	200	ug/L
Ethylbenzene	ND	1.0	ug/L
Trichlorofluoromethane	ND	2.0	ug/L
2-Hexanone	ND	5.0	ug/L
Iodomethane	ND	1.0	ug/L
Isobutyl alcohol	ND	50	ug/L
Methacrylonitrile	ND	10	ug/L
Methylene chloride	ND	1.0	ug/L

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US GEOLOGICAL SURVEY

Client Sample ID: CAFB-AA

GC/MS Volatiles

Lot-Sample #...: D0H110213-002 **Work Order #...:** DHQ25101 **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl methacrylate	ND	1.0	ug/L
4-Methyl-2-pentanone	ND	5.0	ug/L
Propionitrile	ND	4.0	ug/L
Styrene	ND	1.0	ug/L
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L
Tetrachloroethene	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
1,1,1-Trichloroethane	ND	1.0	ug/L
1,1,2-Trichloroethane	ND	1.0	ug/L
Trichloroethene	**1.3**	**1.0**	**ug/L**
1,2,3-Trichloropropane	ND	1.0	ug/L
Vinyl acetate	ND	2.0	ug/L
Vinyl chloride	ND	2.0	ug/L
Xylenes (total)	ND	1.0	ug/L
1,2-Dibromo-3-chloropropane (DBCP)	ND	2.0	ug/L
1,2-Dibromoethane (EDB)	ND	1.0	ug/L
2-Butanone (MEK)	ND	5.0	ug/L
Acrolein	ND	20	ug/L
Ethyl methacrylate	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	101	(82 - 122)
1,2-Dichloroethane-d4	99	(78 - 123)
4-Bromofluorobenzene	100	(80 - 120)
Toluene-d8	98	(82 - 122)

US GEOLOGICAL SURVEY

CAFB-AA

GC/MS Volatiles

Lot-Sample #: D0H110213-002 **Work Order #:** DHQ25101 **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT	RETENTION TIME	UNITS
None				ug/L

US GEOLOGICAL SURVEY

Client Sample ID: CAFB-C

GC/MS Volatiles

Lot-Sample #...: D0H110213-003 **Work Order #...:** DHQ26101 **Matrix.....:** WATER
Date Sampled...: 08/10/00 10:45 **Date Received..:** 08/11/00
Prep Date.....: 08/16/00 **Analysis Date..:** 08/16/00
Prep Batch #...: 0230378 **Analysis Time..:** 22:23
Dilution Factor: 1

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acetone	ND	10	ug/L
Acetonitrile	ND	20	ug/L
Acrylonitrile	ND	20	ug/L
Benzene	ND	1.0	ug/L
Bromodichloromethane	ND	1.0	ug/L
Bromoform	ND	1.0	ug/L
Bromomethane	ND	2.0	ug/L
Carbon disulfide	ND	1.0	ug/L
Carbon tetrachloride	ND	1.0	ug/L
Chlorobenzene	ND	1.0	ug/L
Chloroprene	ND	1.0	ug/L
Dibromochloromethane	ND	1.0	ug/L
Chloroethane	ND	2.0	ug/L
Chloroform	ND	1.0	ug/L
Chloromethane	ND	2.0	ug/L
Allyl chloride	ND	2.0	ug/L
Dibromomethane	ND	1.0	ug/L
trans-1,4-Dichloro-2-butene	ND	1.0	ug/L
Dichlorodifluoromethane	ND	2.0	ug/L
1,1-Dichloroethane	ND	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
1,1-Dichloroethene	ND	1.0	ug/L
cis-1,2-Dichloroethene	ND	1.0	ug/L
trans-1,2-Dichloroethene	ND	0.50	ug/L
1,2-Dichloroethene (total)	ND	1.0	ug/L
1,2-Dichloropropane	ND	1.0	ug/L
cis-1,3-Dichloropropene	ND	1.0	ug/L
trans-1,3-Dichloropropene	ND	1.0	ug/L
1,4-Dioxane	ND	200	ug/L
Ethylbenzene	ND	1.0	ug/L
Trichlorofluoromethane	ND	2.0	ug/L
2-Hexanone	ND	5.0	ug/L
Iodomethane	ND	1.0	ug/L
Isobutyl alcohol	ND	50	ug/L
Methacrylonitrile	ND	10	ug/L
Methylene chloride	ND	1.0	ug/L

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US GEOLOGICAL SURVEY

Client Sample ID: CAFB-C

GC/MS Volatiles

Lot-Sample #...: D0H110213-003 **Work Order #...:** DHQ26101 **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl methacrylate	ND	1.0	ug/L
4-Methyl-2-pentanone	ND	5.0	ug/L
Propionitrile	ND	4.0	ug/L
Styrene	ND	1.0	ug/L
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L
Tetrachloroethene	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
1,1,1-Trichloroethane	ND	1.0	ug/L
1,1,2-Trichloroethane	ND	1.0	ug/L
Trichloroethene	**1.4**	**1.0**	**ug/L**
1,2,3-Trichloropropane	ND	1.0	ug/L
Vinyl acetate	ND	2.0	ug/L
Vinyl chloride	ND	2.0	ug/L
Xylenes (total)	ND	1.0	ug/L
1,2-Dibromo-3-chloropropane (DBCP)	ND	2.0	ug/L
1,2-Dibromoethane (EDB)	ND	1.0	ug/L
2-Butanone (MEK)	ND	5.0	ug/L
Acrolein	ND	20	ug/L
Ethyl methacrylate	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	100	(82 - 122)
1,2-Dichloroethane-d4	97	(78 - 123)
4-Bromofluorobenzene	100	(80 - 120)
Toluene-d8	99	(82 - 122)

US GEOLOGICAL SURVEY

CAFB-C

GC/MS Volatiles

Lot-Sample #: D0H110213-003 **Work Order #:** DHQ26101 **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT	RETENTION TIME	UNITS
None				ug/L

US GEOLOGICAL SURVEY

Client Sample ID: CAFB-D-TB

GC/MS Volatiles

Lot-Sample #...: D0H110213-004 **Work Order #...:** DHQ28101 **Matrix.....:** WATER
Date Sampled...: 08/10/00 09:50 **Date Received..:** 08/11/00
Prep Date.....: 08/16/00 **Analysis Date..:** 08/16/00
Prep Batch #...: 0230378 **Analysis Time..:** 22:47
Dilution Factor: 1

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acetone	ND	10	ug/L
Acetonitrile	ND	20	ug/L
Acrylonitrile	ND	20	ug/L
Benzene	ND	1.0	ug/L
Bromodichloromethane	ND	1.0	ug/L
Bromoform	ND	1.0	ug/L
Bromomethane	ND	2.0	ug/L
Carbon disulfide	ND	1.0	ug/L
Carbon tetrachloride	ND	1.0	ug/L
Chlorobenzene	ND	1.0	ug/L
Chloroprene	ND	1.0	ug/L
Dibromochloromethane	ND	1.0	ug/L
Chloroethane	ND	2.0	ug/L
Chloroform	ND	1.0	ug/L
Chloromethane	ND	2.0	ug/L
Allyl chloride	ND	2.0	ug/L
Dibromomethane	ND	1.0	ug/L
trans-1,4-Dichloro-2-butene	ND	1.0	ug/L
Dichlorodifluoromethane	ND	2.0	ug/L
1,1-Dichloroethane	ND	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
1,1-Dichloroethene	ND	1.0	ug/L
cis-1,2-Dichloroethene	ND	1.0	ug/L
trans-1,2-Dichloroethene	ND	0.50	ug/L
1,2-Dichloroethene (total)	ND	1.0	ug/L
1,2-Dichloropropane	ND	1.0	ug/L
cis-1,3-Dichloropropene	ND	1.0	ug/L
trans-1,3-Dichloropropene	ND	1.0	ug/L
1,4-Dioxane	ND	200	ug/L
Ethylbenzene	ND	1.0	ug/L
Trichlorofluoromethane	ND	2.0	ug/L
2-Hexanone	ND	5.0	ug/L
Iodomethane	ND	1.0	ug/L
Isobutyl alcohol	ND	50	ug/L
Methacrylonitrile	ND	10	ug/L
Methylene chloride	ND	1.0	ug/L

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US GEOLOGICAL SURVEY

Client Sample ID: CAFB-D-TB

GC/MS Volatiles

Lot-Sample #...: D0H110213-004 **Work Order #...:** DHQ28101 **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl methacrylate	ND	1.0	ug/L
4-Methyl-2-pentanone	ND	5.0	ug/L
Propionitrile	ND	4.0	ug/L
Styrene	ND	1.0	ug/L
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L
Tetrachloroethene	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
1,1,1-Trichloroethane	ND	1.0	ug/L
1,1,2-Trichloroethane	ND	1.0	ug/L
Trichloroethene	ND	1.0	ug/L
1,2,3-Trichloropropane	ND	1.0	ug/L
Vinyl acetate	ND	2.0	ug/L
Vinyl chloride	ND	2.0	ug/L
Xylenes (total)	ND	1.0	ug/L
1,2-Dibromo-3-chloropropane (DBCP)	ND	2.0	ug/L
1,2-Dibromoethane (EDB)	ND	1.0	ug/L
2-Butanone (MEK)	ND	5.0	ug/L
Acrolein	ND	20	ug/L
Ethyl methacrylate	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	100	(82 - 122)
1,2-Dichloroethane-d4	95	(78 - 123)
4-Bromofluorobenzene	100	(80 - 120)
Toluene-d8	100	(82 - 122)

US GEOLOGICAL SURVEY

CAFB-D-TB

GC/MS Volatiles

Lot-Sample #: D0H110213-004 **Work Order #:** DHQ28101 **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT	RETENTION TIME	UNITS
None				ug/L

US GEOLOGICAL SURVEY

Client Sample ID: CAFB-D

General Chemistry

Lot-Sample #...: D0H110213-001 **Work Order #...:** DHQ1K **Matrix.....:** WATER
Date Sampled...: 08/10/00 09:35 **Date Received..:** 08/11/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Carbon	**0.48 B**	**1.0**	**mg/L**	**SW846 9060**	**08/30/00**	**0244363**
	Dilution Factor: 1		Analysis Time..: 12:00			
Total Organic Halogens	ND	30.0	ug/L	SW846 9020B	08/23-08/30/00	0244251
	Dilution Factor: 1		Analysis Time..: 12:00			

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: CAFB-AA

General Chemistry

Lot-Sample #...: D0H110213-002 **Work Order #...:** DHQ25 **Matrix.....:** WATER
Date Sampled...: 08/10/00 09:45 **Date Received..:** 08/11/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Carbon	**0.46 B**	**1.0**	**mg/L**	**SW846 9060**	**08/30/00**	**0244363**
	Dilution Factor: 1		Analysis Time..: 12:00			
Total Organic Halogens	ND	30.0	ug/L	SW846 9020B	08/23-08/30/00	0244251
	Dilution Factor: 1		Analysis Time..: 12:00			

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: CAFB-C

General Chemistry

Lot-Sample #...: D0H110213-003 **Work Order #...:** DHQ26 **Matrix.....:** WATER
Date Sampled...: 08/10/00 10:45 **Date Received..:** 08/11/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Carbon	ND	1.0	mg/L	SW846 9060	08/30/00	0244363
	Dilution Factor: 1		Analysis Time..: 12:00			
Total Organic Halogens	**5.7 B**	**30.0**	**ug/L**	**SW846 9020B**	**08/23-08/30/00**	**0244251**
	Dilution Factor: 1		Analysis Time..: 12:00			

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: CAFB-Q

General Chemistry

Lot-Sample #...: D0H110213-005 **Work Order #...:** DHQ2E **Matrix.....:** WATER
Date Sampled...: 08/10/00 09:50 **Date Received..:** 08/11/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Carbon	0.51 B	1.0	mg/L	SW846 9060	08/30/00	0244363
	Dilution Factor: 1		Analysis Time..: 12:00			
Total Organic Halogens	2.9 B	30.0	ug/L	SW846 9020B	08/23-08/30/00	0244251
	Dilution Factor: 1		Analysis Time..: 12:00			

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: CAFB-S

General Chemistry

Lot-Sample #...: D0H110213-006 **Work Order #...:** DHQ2H **Matrix.....:** WATER
Date Sampled...: 08/10/00 11:40 **Date Received..:** 08/11/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Carbon	ND	1.0	mg/L	SW846 9060	08/30/00	0244363
	Dilution Factor: 1		Analysis Time..: 12:00			
Total Organic Halogens	ND	30.0	ug/L	SW846 9020B	08/23-08/30/00	0244251
	Dilution Factor: 1		Analysis Time..: 12:00			

US GEOLOGICAL SURVEY

Client Sample ID: CAFB-T

General Chemistry

Lot-Sample #...: D0H110213-007 **Work Order #...:** DHQ2N **Matrix.....:** WATER
Date Sampled...: 08/10/00 13:00 **Date Received..:** 08/11/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Carbon	ND	1.0	mg/L	SW846 9060	08/30/00	0244363
	Dilution Factor: 1		Analysis Time..: 12:00			
Total Organic Halogens	**3.0 B**	**30.0**	**ug/L**	**SW846 9020B**	**08/23-08/30/00**	**0244251**
	Dilution Factor: 1		Analysis Time..: 12:00			

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: CAFB-B

General Chemistry

Lot-Sample #...: D0H110213-008 **Work Order #...:** DHQ2Q **Matrix.....:** WATER
Date Sampled...: 08/10/00 13:45 **Date Received..:** 08/11/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Carbon	ND	1.0	mg/L	SW846 9060	08/30/00	0244363
	Dilution Factor: 1		Analysis Time..: 12:00			
Total Organic Halogens	ND	30.0	ug/L	SW846 9020B	08/23-08/30/00	0244251
	Dilution Factor: 1		Analysis Time..: 12:00			

US GEOLOGICAL SURVEY

Client Sample ID: CAFB-U

General Chemistry

Lot-Sample #...: D0H110213-009 **Work Order #...:** DHQ2R **Matrix.....:** WATER
Date Sampled...: 08/10/00 14:30 **Date Received..:** 08/11/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Carbon	ND	1.0	mg/L	SW846 9060	08/30/00	0244363
	Dilution Factor: 1		Analysis Time..: 12:00			
Total Organic Halogens	ND	30.0	ug/L	SW846 9020B	08/23-08/30/00	0244251
	Dilution Factor: 1		Analysis Time..: 12:00			

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:

Fredrick E. Gebhardt, USGS-WRD, Hydrologic Technician 15MAR01

DATA INVENTORY

1.1 Sample project number: Severn Trent Services Report # D0H110213

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

Sample collection date: 10AUG00

1.3 Sample locations (location IDs): Wells CAFB-B, CAFB-C, CAFB-D, CAFB-Q, CAFB-S CAFB-T, CAFB-U, and CAFB-AA which was a duplicate sample of CAFB-D

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	8	MS/MSD	0
field duplicate	1	trip blank	1
equipment blank	0	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 Appendix-IX, Volatile organic compounds (VOC)--Method SW5030/SW82601B

√ 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: Fredrick E. Gebhardt 15MAR01

LABORATORY DATA REPORTS

2.1 Analytical Results Report--report date: 01SEP00

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

	VOC SW8260B	TOC SW9060	TOX SW9020
requested:	4	8	8
analyzed:	4	8	8

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? 3.0 °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: APPENDIX-IX, VOLATILE ORGANIC COMPOUNDS-- METHOD SW5030/SW8260B

Name of reviewer(s) and review date: Fredrick E. Gebhardt 15MAR01

LEVEL I AND II -- Data Validation

HOLDING TIMES

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

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

[FG-ORG, p. 6-8]

sample date: 10AUG00 analysis date limit: 24AUG00

Samples were analyzed by 16AUG00, and met required holding times.

SURROGATE SPIKE RECOVERY

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

(all samples and blanks: SW8260A:%R varies)

[FG-ORG, p. 26-29]

All surrogate spike recovery results met Quanterra QC acceptance criteria.

PROJECT REPORTING LIMIT (PRL)

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

PRL's were not provided in Sampling and Analysis Plan (SAP). Reporting limits were raised for sample CAFB-B-EB due to matrix interference.

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; analytes <3 x RL)

[FG-ORG, p. 20-25]

Bromoform was detected at a concentration of 0.45 J µg/L.
This value was qualified with J (estimated result, lab contaminate).

AMBIENT and TRIP BLANKS (water samples only)

3.6 Did blank results meet frequency and QC acceptance criteria? yes √ no ___

(ambient and trip blank frequency varies per sampling period)

[FG-ORG, p. 20-25]

All trip blank results were ND or below reporting limit and met QC acceptance criteria. Ambient condition blank was not collected for this sampling period.

TENTATIVELY IDENTIFIED COMPOUNDS (TICs)

3.7 List number and level of TICs for each sample analyzed on TIC data sheet.

[FG-ORG, p. 41-44]

DUPLICATE CONTROL SAMPLES (DCSs)

3.8 Did DCS results meet frequency and QC acceptance criteria? yes √ no ___

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

[FG-ORG, p. 32-33]

All DCS results met QC acceptance criteria.

SINGLE CONTROL SAMPLES (SCSs)

3.9 Did SCS results meet frequency and QC acceptance criteria? yes √ no ____

(1 SCS per sample lot; %R limits established by laboratory)

[FG-ORG, p. 32-33]

All SCS results met QC acceptance criteria.

LABORATORY METHOD BLANKS

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

(1 method blank per batch; analyte concentration ≤ RL except for common lab contaminants ≤ 5 times RL)

[FG-ORG, p. 20-25]

All method blank results were ND or J value (less than RL) and met QC acceptance criteria.

MATRIX SPIKE AND MATRIX SPIKE DUPLICATE (MS/MSD)

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

(1 set per quarter; method SW8260A: %R and RPD varies)

[FG-ORG, p. 30-31]

MS/MSD samples were not collected.

LEVEL II -- Data Validation

INSTRUMENT CALIBRATION

3.12 Did initial calibrations meet frequency and QC acceptance criteria? yes ____ no ____

[FG-ORG, p. 12-16]

Not reviewed.

3.13 Did continuing calibrations meet frequency and QC acceptance criteria? yes ____ no ____

[FG-ORG, p. 17-19]

Not reviewed.

GC/MS TUNING

3.14 Did BFB tuning results meet frequency and QC acceptance criteria? yes ____ no ____

[FG-ORG, p. 9-11]

Not reviewed.

INTERNAL STANDARDS (IS)

3.15 Did IS results meet frequency and QC acceptance criteria? yes _____ no _____

(all blanks, standards, and samples; IS area limits within 50 to 200%)
[FG-ORG, p. 35-36]

Not reviewed

SAMPLE RESULT VERIFICATION

3.16 No omissions, problems, discrepancies, transcription errors, or reduction (dilution, conversion) errors in selected raw data? [FG-ORG, p. 47] yes _____ no _____

Not reviewed

LEVEL I and II -- Data Validation

ANALYTE RESULTS WITH DATA QUALIFIERS

3.17 Summarize analyte results with data qualifiers. List pertinent information on qualified-data worksheet: _____

3.18 Additional comments: _____

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

Name of reviewer(s) and review date: Fredrick E. Gebhardt 15MAR01

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: 10AUG00 analysis date limit: 07SEP00

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 samples were not collected.

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-D, and CAFB-Q 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: Fredrick E. Gebhardt 15MAR01

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: 10AUG00 analysis date limit: 07SEP00

Samples were analyzed by 30AUG00 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 meet QC acceptance criteria.

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 samples were not collected.

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: Samples had CAFB-C, CAFB-O, and CAFB-T had qualifier B which means that it is estimated and lass 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.

COPY FOR YOUR INFORMATION

CONTRACT LABORATORY DATA-REVIEW WORKSHEET

1.0 GENERAL INFORMATION Laboratory Lot Number: DOH110213

Data reviewer: Richard Daddow Review date: 9/12/00

District, Project, & Account #: New Mexico, Cannon AFB (4635-36004)

Sample collection date: 8/10/00 Sample matrix/no.: water

No. of sample types in lot: Environmental 8 Trip blank 1 Equip. blank ____

MS/MSD ____ Other: ____

2.0 INVOICE STATUS FOR LOT: OK Invoice copy attached X

3.0 DATA REPORTS

Date of Lab analytical report: 9/1/00 Number of copies: bound 1 unbound (2)

No. of volumes of raw-data report: ____ No. of CD copies of raw-data report: 1

Raw-data report reviewed? Yes ____ No X

Comments—Data Reports: EDD file in NWIS format is contained on CD

4.0 SAMPLE ANALYSES *(Page numbers listed in worksheet refer to lab analytical report)*

4.1 Were accelerated turn-around times (TATs) requested for analyses? Yes ____ No X

If yes, list TAT period and if completed: ____

4.2 Were analyses on chain-of-custody (COC) form performed by lab? YES X NO ____

If **no**, list missing or cancelled analyses and reason for non-performance: ____

4.3 Were the samples properly preserved, labeled, no lab log-in problems, and(or) at appropriate temperature (<6 deg. C) upon receipt by the laboratory: Yes ____ No X

If **no**, list sample/lab IDs, and associated problems with when delivered at laboratory:

No sample ID was listed on sample containers for sample CAFB-Q (-005) Lab used time of collection to reference to sample ID on COC form. (p. 45)

Laboratory Lot No: DOH 110213

4.4 Were preparation (extraction) and(or) analysis holding times met? Yes X No ____

If **no**, list analytical methods and sample/lab IDs for samples that exceeded holding-time limits:

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

If **no**, list methods, surrogates, associated sample/lab IDs, lab report page #s: _____

4.6 Were dilution factors greater than 1 for ***organic*** analyses? Yes ____ No X NA _____

If **yes**, list analytical method, lab/sample IDs, and reason for raised dilution factors: dilution ___ high-analyte levels _____ matrix interferences _____ other _____

4.7 Were dilution factors greater than 1 for **inorganic** analyses? Yes ____ No ____ NA X

If **yes**, list analytical method, lab/sample IDs, and reason for raised dilution factors: dilution ___ high-analyte levels _____ matrix interferences _____ other _____

4.8 Additional comments about sample analyses: _____

Laboratory Lot No: DON110213

5.0 QUALITY CONTROL (QC) ANALYSES and RESULTS

5.1 Did lab control samples (LCS/LSCD) meet percent recoveries (%R) criteria? Yes___ No___

If **no**, list method, analytes, LCS/LCSD, and report page #s:_____

5.2 Were any target analytes detected in the **Laboratory Method Blanks**? Yes ____ No X

If **yes**, list method, analytes, report page #s: _____

5.3 Did the **MS/MSD** results meet %R or RPD acceptance criteria? Yes X No___ NA_____

Note: matrix spike and matrix spike duplicate (MS/MSD) data are used to evaluate the effect of sample matrix on the analytical process and should be only used in conjunction with other available lab QC data. In some cases, MS samples not directly associated with this lot may be used by the laboratory.

List analytical method and if MS samples are associated with this lot.

If did not meet acceptance criteria also list analytes; MS, MSD or RPD; and lab report page #:

8260B, 9060, 9020B _____ associated MS lot # yes____ no X

_____ associated MS lot # yes____ no____

_____ associated MS lot # yes____ no____

_____ associated MS lot # yes____ no____

_____ associated MS lot # yes____ no____

_____ associated MS lot # yes____ no____

No MS results reported for method(s):_____

5.4 Additional comments about QC results: _____

Laboratory Lot No: DOH 110213

6.0 ANALYTICAL METHODS USED in this LABORATORY LOT NUMBER

X VOCs by GC/MS--method 8260B App. IX *[water (W) or solids (S) analysis holding-time (HT) of 14 days]*

____ Gasoline Range Organics (GRO) + BTEX--method 8015M-GRO *[W and S: analysis HT 14 days]*

____ Diesel Range Organics-method 8015M-DRO *[W: prep HT 7 days; S: prep HT 14 days; analysis HT 40 days]*

____ Pesticides by GC--method 8081A *[W: prep HT 7 days; S: prep HT 14 days; analysis HT 40 days]*

____ PCBs by GC--method 8082 *[W: prep HT 7 days; S: prep HT14 days; analysis HT 40 days]*

____ Pesticides by GC--method 8141A *[W: prep HT 7 days; S: prep HT 14 days; analysis HT 40 days]*

____ Herbicides by GC--method 8151A *[W: prep HT 7 days; S: prep HT14 days; analysis HT 40 days]*

____ SVOCs by GC/MS--method 8270C *[W: prep HT 7 days; S: prep HT14 days; analysis HT 40 days]*

____ Dioxins and Furans--methods 8280 or 8290 *[W and S: prep HT 30 days; analysis HT 45 days]*

____ PAHs by HPLC method 8310 *[W: prep HT 7 days; S: prep HT14 days; analysis HT 40 days]*

____ Explosives by HPLC method 8330 *[W: prep HT 7 days; S: prep HT14 days; analysis HT 40 days]*

____ Hexane extractable materials (HEM and SGT-HEM)--method 1664 *[W: analysis HT 28 days]*

X Total organic carbon (TOC)--methods 415.1 or 9060 *[W: analysis HT 28 days]*

____ Dissolved organic carbon (DOC)--methods 415.1 or 9060 *[W: analysis HT 28 days]*

X Total organic halides (TOX)--method 9020 *[W: analysis HT 28 days]*

____ Metals by ICP--method 6010B/200.7 Dissolved _____ Total _____ *[W and S: analysis HT 180 days]*

____ Metals by ICP/MS--method 6020/200.8 Dissolved _____ Total _____ *[W and S: analysis HT 180 days]*

____ Metals by GFAA methods *[W and S: analysis HT 180 days]* Methods:Sb-7041, As-7060, Cd-7131 Cr-7191, Pb-7421, Se-7740, Tl-7841 List GFAA metals: _____

____ Hexavalent chromium--method 7196 *[W: analysis HT **24-48 hours**]*

____ Mercury by CVAA--method 7470A (W) and 7471A (S) *[W and S: analysis HT 28 days]*

____ Inorganic anions--method 300 *[W: analysis HT **48 hours**- NO_2, NO_3, ortho-P; HT 28 days--Br,Cl ,F, SO_4]*

____ Total dissolved solids (TDS)--method 160.1 and(or) TSS--method 160.2 *[W: analysis HT 7 days]*

____ Total alkalinity--method 310.1 *[W: analysis HT 14 days]*

____ Nitrogen, ammonia--method 350.1 *[W: analysis HT 28 days]*

____ Nitrogen, TKN--method 351.2 *[W: analysis HT 28 days]*

____ Nitrogen, nitrate + nitrite--method 353.2 *[W: analysis HT 28 days]* NO_3 or NO_2 only *[HT **48 hours**]*

____ Nitrogen, nitrite--method 354.1 *[W: analysis HT **48 hours**]*

____ Total phosphorus--method 365.3 *[W: analysis HT 28 days]*

____ Cyanide, total and amenable--methods 9010B or 9012A *[W and S: analysis HT 14 days]*

____ Other analyses: _____

QC DATA ASSOCIATION SUMMARY

D0H110213

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	WATER	SW846 9060		0244363	0244185
	WATER	SW846 9020B		0244251	0238104
	WATER	SW846 8260B		0230378	0230196
002	WATER	SW846 9060		0244363	0244185
	WATER	SW846 9020B		0244251	0238104
	WATER	SW846 8260B		0230378	0230196
003	WATER	SW846 9060		0244363	0244185
	WATER	SW846 9020B		0244251	0238104
	WATER	SW846 8260B		0230378	0230196
004	WATER	SW846 8260B		0230378	0230196
005	WATER	SW846 9060		0244363	0244185
	WATER	SW846 9020B		0244251	0238104
006	WATER	SW846 9060		0244363	0244185
	WATER	SW846 9020B		0244251	0238104
007	WATER	SW846 9060		0244363	0244185
	WATER	SW846 9020B		0244251	0238104
008	WATER	SW846 9060		0244363	0244185
	WATER	SW846 9020B		0244251	0238104
009	WATER	SW846 9060		0244363	0244185
	WATER	SW846 9020B		0244251	0238104

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: D0H110213 **Work Order #...:** DJ2AE102-LCS **Matrix.....:** WATER
LCS Lot-Sample#: D0H170000-378 DJ2AE103-LCSD
Prep Date.....: 08/16/00 **Analysis Date..:** 08/16/00
Prep Batch #...: 0230378 **Analysis Time..:** 16:11
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	**107**	**(80 - 120)**			**SW846 8260B**
	105	**(80 - 120)**	**1.5**	**(0-20)**	**SW846 8260B**
Chlorobenzene	**104**	**(80 - 120)**			**SW846 8260B**
	101	**(80 - 120)**	**3.4**	**(0-20)**	**SW846 8260B**
1,1-Dichloroethene	**102**	**(80 - 123)**			**SW846 8260B**
	100	**(80 - 123)**	**2.6**	**(0-20)**	**SW846 8260B**
Toluene	**116**	**(77 - 117)**			**SW846 8260B**
	111	**(77 - 117)**	**3.7**	**(0-20)**	**SW846 8260B**
Trichloroethene	**108**	**(84 - 124)**			**SW846 8260B**
	105	**(84 - 124)**	**2.8**	**(0-20)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	101	(82 - 122)
	99	(82 - 122)
1,2-Dichloroethane-d4	100	(78 - 123)
	99	(78 - 123)
4-Bromofluorobenzene	101	(80 - 120)
	100	(80 - 120)
Toluene-d8	101	(82 - 122)
	98	(82 - 122)

NOTE(S):

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

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: D0H110213 **Work Order #...:** DJ2AE102-LCS **Matrix.....:** WATER
LCS Lot-Sample#: D0H170000-378 DJ2AE103-LCSD
Prep Date.....: 08/16/00 **Analysis Date..:** 08/16/00
Prep Batch #...: 0230378 **Analysis Time..:** 16:11
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	RPD	METHOD
Benzene	**10.0**	**10.7**	**ug/L**	**107**		**SW846 8260B**
	10.0	**10.5**	**ug/L**	**105**	**1.5**	**SW846 8260B**
Chlorobenzene	**10.0**	**10.4**	**ug/L**	**104**		**SW846 8260B**
	10.0	**10.1**	**ug/L**	**101**	**3.4**	**SW846 8260B**
1,1-Dichloroethene	**10.0**	**10.2**	**ug/L**	**102**		**SW846 8260B**
	10.0	**9.99**	**ug/L**	**100**	**2.6**	**SW846 8260B**
Toluene	**10.0**	**11.6**	**ug/L**	**116**		**SW846 8260B**
	10.0	**11.1**	**ug/L**	**111**	**3.7**	**SW846 8260B**
Trichloroethene	**10.0**	**10.8**	**ug/L**	**108**		**SW846 8260B**
	10.0	**10.5**	**ug/L**	**105**	**2.8**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	101	(82 - 122)
	99	(82 - 122)
1,2-Dichloroethane-d4	100	(78 - 123)
	99	(78 - 123)
4-Bromofluorobenzene	101	(80 - 120)
	100	(80 - 120)
Toluene-d8	101	(82 - 122)
	98	(82 - 122)

NOTE(S):

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

Bold print denotes control parameters

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: D0H110213 **Work Order #...:** DJ2AE101 **Matrix.....:** WATER
MB Lot-Sample #: D0H170000-378

Prep Date.....: 08/16/00 **Analysis Time..:** 16:59
Analysis Date..: 08/16/00 **Prep Batch #...:** 0230378
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Acetone	ND	10	ug/L	SW846 8260B
Acetonitrile	ND	20	ug/L	SW846 8260B
Acrylcnitrile	ND	20	ug/L	SW846 8260B
Benzene	ND	1.0	ug/L	SW846 8260B
Bromodichloromethane	ND	1.0	ug/L	SW846 8260B
Bromoform	ND	1.0	ug/L	SW846 8260B
Bromomethane	ND	2.0	ug/L	SW846 8260B
Carbon disulfide	ND	1.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260B
Chlorobenzene	ND	1.0	ug/L	SW846 8260B
Chloroprene	ND	1.0	ug/L	SW846 8260B
Dibromochloromethane	ND	1.0	ug/L	SW846 8260B
Chloroethane	ND	2.0	ug/L	SW846 8260B
Chloroform	ND	1.0	ug/L	SW846 8260B
Chloromethane	ND	2.0	ug/L	SW846 8260B
Allyl chloride	ND	2.0	ug/L	SW846 8260B
Dibromomethane	ND	1.0	ug/L	SW846 8260B
trans-1,4-Dichloro-2-butene	ND	1.0	ug/L	SW846 8260B
Dichlorodifluoromethane	ND	2.0	ug/L	SW846 8260B
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260B
cis-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
trans-1,2-Dichloroethene	ND	0.50	ug/L	SW846 8260B
1,2-Dichloroethene (total)	ND	1.0	ug/L	SW846 8260B
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260B
cis-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260B
trans-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260B
1,4-Dioxane	ND	200	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
Trichlorofluoromethane	ND	2.0	ug/L	SW846 8260B
2-Hexanone	ND	5.0	ug/L	SW846 8260B
Iodomethane	ND	1.0	ug/L	SW846 8260B
Isobutyl alcohol	ND	50	ug/L	SW846 8260B
Methacrylonitrile	ND	10	ug/L	SW846 8260B
Methylene chloride	ND	1.0	ug/L	SW846 8260B
Methyl methacrylate	ND	1.0	ug/L	SW846 8260B
4-Methyl-2-pentanone	ND	5.0	ug/L	SW846 8260B
Propicnitrile	ND	4.0	ug/L	SW846 8260B

(Continued on next page)

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: D0H110213 **Work Order #...:** DJ2AE101 **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Styrene	ND	1.0	ug/L	SW846 8260B
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260B
Tetrachloroethene	ND	1.0	ug/L	SW846 8260B
Toluene	ND	1.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260B
Trichloroethene	ND	1.0	ug/L	SW846 8260B
1,2,3-Trichloropropane	ND	1.0	ug/L	SW846 8260B
Vinyl acetate	ND	2.0	ug/L	SW846 8260B
Vinyl chloride	ND	2.0	ug/L	SW846 8260B
Xylenes (total)	ND	1.0	ug/L	SW846 8260B
1,2-Dibromo-3-chloropropane (DBCP)	ND	2.0	ug/L	SW846 8260B
1,2-Dibromoethane (EDB)	ND	1.0	ug/L	SW846 8260B
2-Butanone (MEK)	ND	5.0	ug/L	SW846 8260B
Acrolein	ND	20	ug/L	SW846 8260B
Ethyl methacrylate	ND	1.0	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	101	(82 - 122)
1,2-Dichloroethane-d4	100	(78 - 123)
4-Bromofluorobenzene	99	(80 - 120)
Toluene-d8	100	(82 - 122)

NOTE(S):

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

US GEOLOGICAL SURVEY

Method Blank Report

GC/MS Volatiles

Lot-Sample #: D0H170000-378 B **Work Order #:** DJ2AE101 **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT	RETENTION TIME	UNITS
None				ug/L

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: D0H110213 **Work Order #...:** DHP3F107-MS **Matrix.....:** WATER
MS Lot-Sample #: D0H110117-001 DHP3F108-MSD
Date Sampled...: 08/10/00 10:00 **Date Received..:** 08/11/00
Prep Date.....: 08/16/00 **Analysis Date..:** 08/16/00
Prep Batch #...: 0230378 **Analysis Time..:** 17:59
Dilution Factor: 20

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	**108**	**(80 - 120)**			**SW846 8260B**
	106	**(80 - 120)**	**1.9**	**(0-20)**	**SW846 8260B**
Chlorobenzene	**103**	**(80 - 120)**			**SW846 8260B**
	104	**(80 - 120)**	**0.71**	**(0-20)**	**SW846 8260B**
1,1-Dichloroethene	**103**	**(80 - 123)**			**SW846 8260B**
	102	**(80 - 123)**	**1.2**	**(0-20)**	**SW846 8260B**
Toluene	**117**	**(77 - 117)**			**SW846 8260B**
	116	**(77 - 117)**	**0.93**	**(0-20)**	**SW846 8260B**
Trichloroethene	**109**	**(84 - 124)**			**SW846 8260B**
	107	**(84 - 124)**	**2.0**	**(0-20)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	100	(82 - 122)
	99	(82 - 122)
1,2-Dichloroethane-d4	99	(78 - 123)
	97	(78 - 123)
4-Bromofluorobenzene	103	(80 - 120)
	100	(80 - 120)
Toluene-d8	100	(82 - 122)
	100	(82 - 122)

NOTE(S):

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

Bold print denotes control parameters

MATRIX SPIKE SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: D0H110213 **Work Order #...:** DHP3F107-MS **Matrix.....:** WATER
MS Lot-Sample #: D0H110117-001 DHP3F108-MSD
Date Sampled...: 08/10/00 10:00 **Date Received..:** 08/11/00
Prep Date.....: 08/16/00 **Analysis Date..:** 08/16/00
Prep Batch #...: 0230378 **Analysis Time..:** 17:59
Dilution Factor: 20

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCENT RECOVERY	RPD	METHOD
Benzene	**ND**	**200**	**217**	**ug/L**	**108**		**SW846 8260B**
	ND	**200**	**213**	**ug/L**	**106**	**1.9**	**SW846 8260B**
Chlorobenzene	**ND**	**200**	**206**	**ug/L**	**103**		**SW846 8260B**
	ND	**200**	**208**	**ug/L**	**104**	**0.71**	**SW846 8260B**
1,1-Dichloroethene	**ND**	**200**	**209**	**ug/L**	**103**		**SW846 8260B**
	ND	**200**	**207**	**ug/L**	**102**	**1.2**	**SW846 8260B**
Toluene	**ND**	**200**	**234**	**ug/L**	**117**		**SW846 8260B**
	ND	**200**	**232**	**ug/L**	**116**	**0.93**	**SW846 8260B**
Trichloroethene	**ND**	**200**	**221**	**ug/L**	**109**		**SW846 8260B**
	ND	**200**	**216**	**ug/L**	**107**	**2.0**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	100	(82 - 122)
	99	(82 - 122)
1,2-Dichloroethane-d4	99	(78 - 123)
	97	(78 - 123)
4-Bromofluorobenzene	103	(80 - 120)
	100	(80 - 120)
Toluene-d8	100	(82 - 122)
	100	(82 - 122)

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

General Chemistry

Client Lot #...: D0H110213 **Matrix.....:** WATER

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Halogens		Work Order #: DJP00102	LCS Lot-Sample#: D0H310000-251		
	83	(79 - 115)	SW846 9020B	08/23/00	0244251

Dilution Factor: 1
Analysis Time..: 12:00

NOTE(S):

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

LABORATORY CONTROL SAMPLE DATA REPORT

General Chemistry

Client Lot #...: D0H110213 **Matrix.....:** WATER

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Halogens			Work Order #:	DJP00102	LCS Lot-Sample#:	D0H310000-251	
	100	82.8	ug/L	83	SW846 9020B	08/23/00	0244251

Dilution Factor: 1
Analysis Time..: 12:00

NOTE(S):

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

LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Lot-Sample #...: D0H110213 **Matrix.....:** WATER

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Carbon		WO#:DJPJ3102-LCS/DJPJ3103-LCSD				LCS Lot-Sample#: D0H310000-363	
	100	(90 - 110)			SW846 9060	08/30/00	0244363
	97	(90 - 110)	3.1	(0-10)	SW846 9060	08/30/00	0244363

Dilution Factor: 1

NOTE(S):

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

LABORATORY CONTROL SAMPLE DATA REPORT

General Chemistry

Lot-Sample #...: D0H110213 **Matrix.....:** WATER

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Carbon		WO#:DJPJ3102-LCS/DJPJ3103-LCSD				LCS	Lot-Sample#: D0H310000-363	
	25.0	25.1	mg/L	100		SW846 9060	08/30/00	0244363
	25.0	24.3	mg/L	97	3.1	SW846 9060	08/30/00	0244363

Dilution Factor: 1

NOTE(S):

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

METHOD BLANK REPORT

General Chemistry

Client Lot #...: D0H110213 **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Halogens		Work Order #: DJP00101		MB Lot-Sample #:	D0H310000-251	
	ND	30.0	ug/L	SW846 9020B	08/23/00	0244251
		Dilution Factor: 1				
		Analysis Time..: 12:00				
Total Organic Carbon		Work Order #: DJPJ3101		MB Lot-Sample #:	D0H310000-363	
	ND	1.0	mg/L	SW846 9060	08/30/00	0244363
		Dilution Factor: 1				
		Analysis Time..: 12:00				

NOTE(S):

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

MATRIX SPIKE SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #...: D0H110213 **Matrix.....:** WATER
Date Sampled...: 08/03/00 11:30 **Date Received..:** 08/04/00

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Halogens			WO#: DHDA2114-MS/DHDA2115-MSD			MS Lot-Sample #: D0H040142-004	
	107	(79 - 115)			SW846 9020B	08/23/00	0238290
	103	(79 - 115)	3.8	(0-18)	SW846 9020B	08/23/00	0238290
		Dilution Factor: 1					
		Analysis Time..: 12:00					
Total Organic Carbon			WO#: DJCNW14M-MS/DJCNW14N-MSD			MS Lot-Sample #: D0H240162-004	
	98	(90 - 110)			SW846 9060	08/30/00	0244363
	99	(90 - 110)	0.52	(0-10)	SW846 9060	08/30/00	0244363
		Dilution Factor: 1					
		Analysis Time..: 12:00					

NOTE(S):

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

MATRIX SPIKE SAMPLE DATA REPORT

General Chemistry

Client Lot #...: D0H110213 **Matrix.....:** WATER
Date Sampled...: 08/03/00 11:30 **Date Received..:** 08/04/00

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Halogens			WO#: DHDA2114-MS/DHDA2115-MSD				MS Lot-Sample #: D0H040142-004		
	ND	100	107	ug/L	107		SW846 9020B	08/23/00	0238290
	ND	100	103	ug/L	103	3.8	SW846 9020B	08/23/00	0238290
			Dilution Factor: 1						
			Analysis Time..: 12:00						
Total Organic Carbon			WO#: DJCNW14M-MS/DJCNW14N-MSD				MS Lot-Sample #: D0H240162-004		
	ND	25.0	24.6	mg/L	98		SW846 9060	08/30/00	0244363
	ND	25.0	24.7	mg/L	99	0.52	SW846 9060	08/30/00	0244363
			Dilution Factor: 1						
			Analysis Time..: 12:00						

NOTE(S):

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

U.S. GEOLOGICAL SURVEY, WATER RESOURCES DIVISION, NEW MEXICO DISTRICT
ANALYTICAL REQUEST/CHAIN OF CUSTODY

Project Name & Number: Cannon Air Force Base, Ground Water Sampling 463536004	PACKING AND SHIPPING DETAILS
	Packed and Sealed for Shipping by: Fred Gebhardt — Seal Number: 081535
Sampling Location: Landfill-5 (wells Q, B, C, D, S, T, and U), Cannon Air Force Base, NM	Delivered to Shipper by: Fred Gebhardt — Airbill Number: 8121 5767 9810
Team Leader: Project chief: Fredrick E. Gebhardt	Sampling Status: [X] Done [ ] Continuing

	Sample Date	Sample Time	Field Sample Number	Sample Type	No. of Containers	Analytical Methods (Parameters)	Remarks
1.	AUG 10, 2000	0935	CAFB- D	Ground water	5	All Appx-IX: TOC-SW9060, TOX-SW9020, VOC-SW5030/SW8260B	Environmental Sample
2	"	0945	CAFB-AA	"	5	"	"
3	"	1045	CAFB-C	"	5	"	"
4	"	0950	CAFB-BD-TB	ULTRA PURE	3	VOC SW5030/SW8260B	TRIP BLANK
5	"	0830	CAFB-Q	GROUND WATER	2	TOC - SW9060 TOX - SW9020	ENVIRONMENTAL SAMPLE

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
Fredrick E. Gebhardt	TO FEDERAL EXPRESS	8/10/00	1630	Severn Trent Services 4955 Yarrow Street Arvada, CO 80002 ph: (303) 421-6611 Attention: Karen Kuoppala	Condition of Contents
Fed Ex	Rachel A Dolent	8/11/00	930		Contents Temperature
					Laboratory Project Number

3.0°C MPK 8/11/00

U.S. GEOLOGICAL SURVEY, WATER RESOURCES DIVISION, NEW MEXICO DISTRICT
ANALYTICAL REQUEST/CHAIN OF CUSTODY

25228 8.11.00 KK

Project Name & Number: Cannon Air Force Base, Ground Water Sampling 463536004	PACKING AND SHIPPING DETAILS
	Packed and Sealed for Shipping by: Fred Gebhardt — Seal Number: 081535 ~~135612~~
Sampling Location: Landfill-5 (wells Q, B, C, D, S, T, and U), Cannon Air Force Base, NM	Delivered to Shipper by: Fred Gebhardt — Airbill Number: ~~8121 5767 9876~~
Team Leader: Project chief: Fredrick E. Gebhardt	Sampling Status: [X] Done [ ] Continuing 812157679810

	Sample Date	Sample Time	Field Sample Number	Sample Type	No. of Containers	Analytical Methods (Parameters)	Remarks
6	AUG 10 2000	1140	CAFB-S	Ground water	2	All Appx-IX: TOC-SW9060, TOX-SW9020, ~~VOC-SW5030/SW8260~~B	Environmental Sample
7	"	1300	CAFB-T	"	2	"	"
8	"	1345	CAFB-B	"	2	"	"
9	"	1430	CAFB-U	"	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
Fredrick E. Gebhardt	TO FEDERAL EXPRESS	8/10/00	1630	Severn Trent Services 4955 Yarrow Street Arvada, CO 80002 ph: (303) 421-6611 Attention: Karen Kuoppala	Condition of Contents
					Contents Temperature
		8/11/00	[illegible]		Laboratory Project Number

Severn Trent Laboratories - Denver

Sample Receiving Checklist

Lot #: DOH 110213 Date/Time Received: 8/11/00 830

Company Name & Sampling Site: USGS / New Mexico

*Cooler #(s): 1

Temperatures: 3.0°c

Unpacking & Labeling Check Points:

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

Document any problems or discrepancies and the actions taken to resolve them on a Condition Upon Receipt Anomaly Report (CUR)

Severn Trent Laboratories - Denver
Condition Upon Receipt Anomaly Report (CUR)

Client: USGS / New Mexico Date/Time: 8/11/00 1435

Lot No: D0H110DT3 Initiated by: RAD

Affected Samples COC#

Client ID	Lab ID	Analyses Requested
CAFB-2	5	TOX, TOC

CONDITION/ANOMALY/VARIANCE (CHECK ALL THAT APPLY):

☐COOLERS
- ☐Not Received, No Chain of Custody (COC)
- ☐Not Received but COC(s) Available
- ☐Leaking
- ☐Other:

☐ TEMPERATURE (greater than 6° C)
- ☐Cooler Temp
- ☐Temperature Blank

☐CONTAINERS
- ☐Leaking
- ☐Broken
- ☐Extra
- ☐Without Labels
- ☐VOA Vials with Headspace _____ mm
- ☐Other:

☐CUSTODY SEALS (COOLER(S)/CONTAINER(S)
- ☐None
- ☐ Not Intact
- ☐Other:

☐CHAIN OF CUSTODY (COCs)
- ☐Not relinquished by Client; No date/time Relinq.
- ☐ Incomplete Information
- ☐Other:

☒ CONTAINER LABELS
- ☒Not the same ID/info as in COC
- ☐ Incomplete
- ☐ID COLLECTION ☐Time ☐Date ☐PRESERVATIVE
- ☐ Markings/Info smeared or illegible
- ☐Torn
- ☐Other:

☐ SAMPLES
- ☐Samples NOT RECEIVED but listed on COC ------ ☐will be noted on COC ☐ Client to send samples with new COC
- ☐Samples received but NOT LISTED on COC
- ☐Logged based on Label Information
- ☐Logged based on info from other samples on COC
- ☐ Logged according to Work Plan
- ☐Logged on HOLD UNTIL FURTHER NOTICE
- ☐ Other:

- ☐ Mislabeled as to tests, preservatives, etc.
- ☐Holding time expired
- ☐ Improper container used
- ☐Not preserved / Improper preservative used
- ☐ Improper pH _____ ☐ Lab to preserve sample
- ☐ Insufficient quantities for analysis

Comments: No Sample ID. Used time as the indicator

Corrective Action:
- ☐ Client Informed: verbally on: _____ By: _____ : In writing on: _____ By: _____
- ☐ Sample(s) processed "as is". _____
- ☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review: _____ Date: _____

Project Management Review: _____ Date: 8-1-00

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

N:\QA\Forms\Sample Receiving\ Condition Upon Receipt Report 1/4/99 version

APPENDIX III

Field Data

FIELD METHODS

Preperation for Purging and Sampling Cannon Air Force Base Landfill 5 wells.

- When arriving at each well the well cover is opened and screened for volatile compounds by using a HNU photoionization detector. Water levels are then measured using a Solinst electric tape. All information from arriving to leaving well site is recorded in a record book.
- Meters for collecting water field parameters are calibrated. Meters used are: Orion pH meter, model 250A; Orion conductance meter, model 126; YSI dissolve oxygen meter, models 57 or 55.
- Nitrogen gas is connected to air intake valve on purge/sample pump. Nitrogen gas pressure varies on each well.

Purging water before sampling.

- From each well, three well volumes of water or stabilization of field parameters is achieved before sampling. Field parameters are collected at the beginning of water purging then collected after every five gallons water purged. All water purged is contained in a water tank on site next to each well.
- Each well is equiped with a dedicated Bennett Pump. Dedicated pumps require no decontamination and no equipment blanks to be collected (except for initial installation).
- Bennett Pumps are a automatic reciprocating piston motor, operated by compressed air, which generates power for operating a double acting, piston fluid pump. Each pump is set just above the water table with an approximate ten foot extension discharge hose attached to the bottom of the pump and submerged in the groundwater.

Sampling.

- Nitrogen gas pressure is reduced. EPA's Groundwater Sampling Protocol are followed for sampling procedures, QA/QC, and the order in which each sample bottle is collected.
- After samples are collected, each bottle will be labeled, bagged, and stored on ice until samples are packed and ready for shipping.
- Each label will have the following data: Collecting agency; Location; Sample ID; Date and time; Sample type; Analytical methods; Collectors; Bottle type and number.

Shipping.

- Sample bottles will be packed in a cooler with bagged ice and packing material. Analytical Request/Chain of Custody forms will be placed in a sealed plastic bag on top of the sample bottles. Coolers will be sealed with strapping tape and a Chain of Custody Seal with seal number.
- Coolers will be shipped by Federal Express shipping company. Coolers will be shipped overnight, and shipped on the same day samples were collected.

Sample container and preservation requirements
Landfill 5

Parameters and methods	Bottle Size and Type	Preservatives
Appendix-IX, Volatile Organic Compounds SW8260B	Three 40 ml glass vials	200 uL 50 % Hydrochloric Acid, Chilled to maintain 4 degrees Celsius
Total Organic Carbon (TOC) SW9060	16 oz. glass	2 mL 50% Sulfuric Acid, pH<2, Chilled to maintain 4 degrees Celsius
Total Organic Halogen, (TOX), SW9020B	8 oz. glass (amber)	1 mL 50% Sulfuric Acid, pH<2, Chilled to maintain 4 degrees Celsius

8/10/00 CAFB - LANDFILL 5

0130 RK DEWEES, ~~MARS~~ LOUIS TRUJILLO, AND FRED GEBHARDT ARRIVE AT BACKGROUND WELL Q ON CAFB. WILL CALIBRATE METERS + PREPARE TO START PURGING THE WELL

- pH METER - ORION METER MODEL 250A S/N 001952
  CALIBRATED W/ BUFFERS 7.0 + 10.0
  CALIBRATION READINGS 7.00 + 10.01 SLOPE 104.1
- CONDUCTANCE METER ORION MODEL 126 S/N 5144968
  CALIBRATED W/ STANDARDS 754 + 1010
  CALIBRATION READINGS 760 + 998
- DOMETER YSI 57 MODEL W391827
  PRESSURE - 659 TEMP. - 18.5
  INITIAL - 7.4 CHART - 8.09
  D.O -

0745 WATER LEVEL 286.10 HNU READING = 0

TIME	VOL (GAL)	TEMP (C°)	pH	COND (µm/s)	DO
0757	<0.5	19.3 ~~250~~	7.93	7.29	—
0801	0.5	18.7	7.38	7.40	8.1
0805	10.0	18.6	7.43	7.35	7.0
0810	15.0	18.5	7.51	7.36	7.25
0813	20.0	18.5	7.56	7.35	7.3
0818	25.0	18.5	7.55	7.35	7.20
0822	30.0	18.5	7.57	7.34	7.18

0830 COLLECTED ENVIRONMENTAL SAMPLE CAFB-Q

8/10/00

CAFB

THIS SAMPLE ROUND FOR LANDFILL 5 WILL ONLY BE SAMPLE FOR TOX & TOC. THE EXCEPTION WILL BE FOR WELLS C & D.

0845 ARRIVE AT WELL D.

0850 WATER LEVEL 294.33 HNU READING = 0

TIME	VOL (GAL)	TEMP	pH	COND	DO
0851	<0.5	22.4	7.96	5.34	—
0856	5.0	19.9	7.54	5.85	5.80
0900	10.0	19.2	7.45	5.86	4.90
0905	15.0	18.9	7.48	5.87	4.70
0909	20.0	18.9	7.48	5.84	4.50
0914	25.0	18.7	7.50	5.83	4.35
	SWITCHING N_2 TANKS				
0921	30.0	18.8	7.50	5.85	4.25
0926	35.0	18.7	7.48	5.86	4.2
0930	40.0	18.7	7.50	5.87	4.2

0935 COLLECTED ENVIRONMENTAL SAMPLE CAFB-D

0945 COLLECTED DUPLICATE SAMPLE CAFB-AA

8/10/00

CAFB

0950 COLLECTED TRIP BLANK CAFB-D-TB
0955 ARRIVED AT WELL CAFB-C
1000 WATER LEVEL 301.75 HNU READING = 0

TIME	VOL (GAL)	TEMP. (C°)	pH	COND	DO
1005	<0.5	21.4	7.42	5.96	—
1009	5.0	19.4	7.53	6.09	4.35
1013	10.0	19.6	7.60	6.10	3.90
1017	15.0	19.5	7.61	6.11	3.90
1021	20.0	19.3	7.64	6.08	3.75
1026	25.0	19.0	7.64	6.08	3.75
1031	30.0	18.9	7.66	6.09	3.60
1035	35.0	18.8	7.66	6.08	3.75
1040	40.0	18.8	7.66	6.08	3.50

1045 COLLECTED ENVIRONMENTAL SAMPLE CAFB-C
1058 ARRIVED AT WELL CAFB-S.
1100 WATER LEVEL 296.29 HNU READING = 0

TIME	VOL (GAL)	TEMP	pH	COND	DO
1105	<0.5	23.9	7.28	7.52	—
1110	5.0	20.2	7.53	7.64	6.25
1116	10.0	19.6	7.60	7.64	5.80
1120	15.0	18.9	7.63	7.66	5.80
1125	20.0	19.3	7.64	7.68	5.95
1129	25.0	19.0	7.67	7.69	5.40
1134	30.0	19.1	7.65	7.68	5.50

1140 COLLECTED ENVIRONMENTAL SAMPLE CAFB-S.

8/10/00 CAFB

1142 ARRIVED AT WELL CAFB-T

1145 WATER LEVEL 294.77. HNU READING = 0

	TIME	VOL (GAL)	TEMP	pH	COND	DO
*	1220	<0.5	30.2	7.22	7.94	—
	1225	5.0	24.3	7.47	7.93	5.30
	1228	10.0	20.3	7.56	8.06	5.70
	1233	15.0	19.4	7.60	8.11	5.45
	1237	20.0	19.4	7.64	8.17	5.25
	1242	25.0	19.5	7.65	8.19	5.30

1245 PUMP STOPPED PUMPING, WILL TURN OFF N_2 ALLOWING THE WELL TO RECOVER. HOPEFULLY, THAT IS THE PROBLEM.

1300 COLLECTED ENVIRONMENTAL SAMPLE CAFB-T

* NO WATER WAS BEING PUMPED TO THE SURFACE. PULLED PUMP, DISCOVERED NO INTAKE HOSE ON BOTTOM PUMP. REMOVED PUMP FROM WELL I USED IT'S INTAKE HOSE ON WELL T, WELL I IS NO LONGER IN ~~SURFACE~~ SERVICE, WELL IS DRY.

8/10/00 CAFB

1307 ARRIVE AT WELL CAFB-B. BEFORE PURGING WELL WILL DOWN LOAD W.L. DATA FROM CR-10, THEN CHARGE IT'S BATTERY.

1310 WATER LEVEL 295.38, NO HNU READING.

TIME	VOL (GAL)	TEMP	pH	COND	DO
1315	<0.5	22.5	7.66	7.70	—
1320	5.0	19.4	7.48	7.82	*
1324	10.0	19.2	7.49	7.83	3.52
1327	15.0	19.1	7.51	7.86	3.05
1332	20.0	19.0	7.55	7.83	3.28
1336	25.0	18.8	7.58	7.83	3.55
1343	30.0	19.0	7.60	7.83	4.36

D.O. METER QUIT. SWITCH METERS MODEL YSI 55S S/N 99J0723

1345 COLLECTED ENVIRONMENTAL SAMPLE CAFB-B.

1350 ARRIVE AT WELL CAFB-U

1352 WATER LEVEL 294.12 HNU READING = 0.

TIME	VOL (GAL)	TEMP (C°)	pH	COND	DO
1357	<0.5	18.9	8.24	7.54	—
1401	5.0	18.8	8.87	7.38	5.70
1405	10.0	19.0	8.46	7.55	6.19
1409	15.0	19.2	8.07	7.67	6.50
1413	20.0	19.2	7.96	7.66	6.49
1417	25.0	19.1	7.92	7.72	6.71
1422	30.0	19.0	7.90	7.72	6.83

1430 COLLECTED ENVIRONMENTAL SAMPLE CAFB-U