

Enseco Incorporated

INVERSE

ANALYTICAL RESULTS  
FOR  
U.S. GEOLOGICAL SURVEY  
ENSECO-RMAL NO. 012743

JANUARY 31, 1991



KAFB1083



## **Introduction**

This report presents the analytical results as well as supporting information to aid in the evaluation and interpretation of the data and is arranged in the following order:

- o Sample Description Information
- o Analytical Test Requests
- o Analytical Results
- o Quality Control Report

The Duplicate Control Sample (DCS) report associated with the samples in this project shows four compounds with RPDs slightly above QC limits. No specific problem could be identified and with the percent recoveries for both DCS1 and DCS2 well within control limits, the data has been reported.

## **Sample Description Information**

The Sample Description Information lists all of the samples received in this project together with the internal laboratory identification number assigned for each sample. Each project received at Enseco - RMAL is assigned a unique six digit number. Samples within the project are numbered sequentially. The laboratory identification number is a combination of the six digit project code and the sample sequence number.

Also given in the Sample Description Information is the Sample Type (matrix), Date of Sampling (if known) and Date of Receipt at the laboratory.

## **Analytical Test Requests**

The Analytical Test Requests lists the analyses that were performed on each sample. The Custom Test column indicates where tests have been modified to conform to the specific requirements of this project.

SAMPLE DESCRIPTION INFORMATION  
for  
U.S. Geological Survey

Lab ID	Client ID	Matrix	Sampled Date	Time	Received Date
012743-0001-SA	KAFB090210-2	AQUEOUS	06 DEC 90	10:15	07 DEC 90
012743-0001-MB	Dioxin Method Blank	AQUEOUS			09 JAN 91
012743-0002-SA	KAFB090209-2	AQUEOUS	06 DEC 90	10:15	07 DEC 90

ANALYTICAL TEST REQUESTS  
for  
U.S. Geological Survey

Lab ID: 012743	Group Code	Analysis Description	Custom Test?
0001 - 0002	A	Total Organic Carbon (TOC)	N
		Total Organic Halogen (TOX)	N
		Chromium, Furnace AA	N
		Chromium, Furnace AA (Total)	N
		Prep - Total Metals, ICP	N
		Volatile Organics	N
		Appendix IX List	N
		Screen - Volatile Organics	N
		Semivolatile Organics	N
		Appendix IX List	N
		Prep - Semivolatile Organics by GC/MS	N
		Chlorinated Pesticides and PCB's	N
		Appendix IX List	N
		Prep - Organochlorine Pesticides/PCBs by GC	N
		Appendix IX Herbicides	N
		Prep - Herbicides by GC	N
		Appendix IX Metals (Total) done by ICP	N
		Arsenic, Furnace AA (Total)	N
		Prep - Total Metals, Furnace AA	N
		Thallium, Furnace AA (Total)	N
		Selenium, Furnace AA (Total)	N
		Lead, Furnace AA (Total)	N
		Appendix IX Metals done by ICP	N
		Arsenic, Furnace AA (Dissolved)	N
		Thallium, Furnace AA (Dissolved)	N
		Selenium, Furnace AA (Dissolved)	N
		Lead, Furnace AA (Dissolved)	N
		Mercury, Cold Vapor AA (Dissolved)	N
		Prep - Mercury, Cold Vapor AA, (Dissolved)	N
		Mercury, Cold Vapor AA (Total)	N
		Prep - Mercury, Cold Vapor AA (Total)	N
		Cyanide, Total	N
		Sulfide, Total	N
		Nitrate Plus Nitrite	N
		Appendix IX C14-C16 Dioxins and Furans	N
		Prep- Low Res. Method 8280 Extraction for Dioxins/Furans	N
		Volatiles Library Search (10 Compound TID)	N
		Semivolatiles Library Search (20 Compound ID)	N
		Halogenated Volatile Organics	N
		Halogenated Volatile Organics-2nd Column Analysis	N

## Analytical Results

The analytical results for this project are presented in the following data tables. Each data table includes sample identification information, and when available and appropriate, dates sampled, received, authorized, prepared and analyzed. The authorization data is the date when the project was defined by the client such that laboratory work could begin.

Data sheets contain a listing of the parameters measured in each test, the analytical results and the Enseco reporting limit. Reporting limits are adjusted to reflect dilution of the sample, when appropriate. Solid and waste samples are reported on an "as received" basis, i.e. no correction is made for moisture content.

Enseco-RMAL is no longer routinely blank-correcting analytical data. Uncorrected analytical results are reported, along with associated blank results, for all organic and metals analyses. Analytical results and blank results are reported for conventional inorganic parameters as specified in the method. This policy is described in detail in the Enseco Incorporated Quality Assurance Program Plan for Environmental Chemical Monitoring, Revision 3.3, May, 1989.

The results from the Standard Enseco QA/QC Program, which generates data which are independent of matrix effects, is provided subsequently.

Volatile Organics  
Appendix IX List  
Method 8240

Client Name: U.S. Geological Survey  
Client ID: KAFB090210-2  
Lab ID: 012743-0001-SA  
Matrix: AQUEOUS  
Authorized: 07 DEC 90

Sampled: 06 DEC 90  
Prepared: 13 DEC 90

Received: 07 DEC 90  
Analyzed: 13 DEC 90

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro- propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro- 2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected  
NA = Not applicable

Reported By: Deneen Spence

Approved By: Jeff Lowry

Volatile Organics  
Appendix IX List  
Method 8240

Client Name: U.S. Geological Survey  
Client ID: KAFB090210-2  
Lab ID: 012743-0001-SA  
Matrix: AQUEOUS  
Authorized: 07 DEC 90

Sampled: 06 DEC 90  
Prepared: 13 DEC 90

Received: 07 DEC 90  
Analyzed: 13 DEC 90

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0
Surrogate	Recovery		
Toluene-d8	100	%	--
4-Bromofluorobenzene	100	%	--
1,2-Dichloroethane-d4	104	%	--

ND = Not detected  
NA = Not applicable

Reported By: Deneen Spence

Approved By: Jeff Lowry

TENTATIVELY IDENTIFIED COMPOUNDS

FOR

U.S. GEOLOGICAL SURVEY

SAMPLE NUMBER 012743-0001

<u>Compound Name</u>	<u>Fraction</u>	<u>Confidence Level</u>	<u>Estimated Concentration ug/L</u>
Pentane,3-Methyl-	VOA	2	5.5

NOTES:

Confidence Levels

- Level 3 - Confirmed Identification
- Level 2 - Confident Identification
- Level 1 - Tentative Identification

Please refer to the discussion for further details.



Volatile Organics  
Appendix IX List  
Method 8240

Client Name: U.S. Geological Survey  
Client ID: KAFB090209-2  
Lab ID: 012743-0002-SA  
Matrix: AQUEOUS  
Authorized: 07 DEC 90

Sampled: 06 DEC 90  
Prepared: 13 DEC 90

Received: 07 DEC 90  
Analyzed: 13 DEC 90

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro- propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro- 2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

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ND = Not detected  
NA = Not applicable

Reported By: Deneen Spence

Approved By: Jeff Lowry

Volatile Organics  
Appendix IX List  
Method 8240

Client Name: U.S. Geological Survey  
Client ID: KAFB090209-2  
Lab ID: 012743-0002-SA  
Matrix: AQUEOUS  
Authorized: 07 DEC 90

Sampled: 06 DEC 90  
Prepared: 13 DEC 90

Received: 07 DEC 90  
Analyzed: 13 DEC 90

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0
Surrogate	Recovery		
Toluene-d8	99	%	--
4-Bromofluorobenzene	98	%	--
1,2-Dichloroethane-d4	106	%	--

ND = Not detected  
NA = Not applicable

Reported By: Deneen Spence

Approved By: Jeff Lowry

TENTATIVELY IDENTIFIED COMPOUNDS

FOR

U.S. GEOLOGICAL SURVEY

SAMPLE NUMBER 012743-0002

<u>Compound Name</u>	<u>Fraction</u>	<u>Confidence Level</u>	<u>Estimated Concentration ug/L</u>
Butanal,2-Methyl-	VOA	2	54
Cyclopentane,Methyl-	VOA	2	15

NOTES:

Confidence Levels

- Level 3 - Confirmed Identification
- Level 2 - Confident Identification
- Level 1 - Tentative Identification

Please refer to the discussion for further details.

Semivolatile Organics  
Appendix IX List  
Method 8270

Client Name: U.S. Geological Survey  
Client ID: KAFB090210-2  
Lab ID: 012743-0001-SA  
Matrix: AQUEOUS  
Authorized: 07 DEC 90

Sampled: 06 DEC 90  
Prepared: 11 DEC 90

Received: 07 DEC 90  
Analyzed: 01 JAN 91

Parameter	Result	Units	Reporting Limit
Acenaphthene	ND	ug/L	10
Acenaphthylene	ND	ug/L	10
Acetophenone	ND	ug/L	10
2-Acetylaminofluorene	ND	ug/L	100
4-Aminobiphenyl	ND	ug/L	10
Aniline	ND	ug/L	10
Anthracene	ND	ug/L	10
Aramite	ND	ug/L	10
Benzo(a)anthracene	ND	ug/L	10
Benzo(b)fluoranthene	ND	ug/L	10
Benzo(k)fluoranthene	ND	ug/L	10
Benzo(g,h,i)perylene	ND	ug/L	10
Benzo(a)pyrene	ND	ug/L	10
Benzyl alcohol	ND	ug/L	10
4-Bromophenyl phenyl ether	ND	ug/L	10
Butyl benzyl phthalate	ND	ug/L	10
2-sec-Butyl-4,6-dinitro- phenol	ND	ug/L	10
4-Chloroaniline	ND	ug/L	10
bis(2-Chloroethoxy)- methane	ND	ug/L	10
bis(2-Chloroethyl) ether	ND	ug/L	10
bis(2-Chloroisopropyl)- ether	ND	ug/L	10
4-Chloro-3-methylphenol	ND	ug/L	10
2-Chloronaphthalene	ND	ug/L	10
2-Chlorophenol	ND	ug/L	10
4-Chlorophenyl phenyl ether	ND	ug/L	10
Chrysene	ND	ug/L	10
Dibenz(a,h)anthracene	ND	ug/L	10
Dibenzofuran	ND	ug/L	10
Di-n-butyl phthalate	77	ug/L	10
1,2-Dichlorobenzene	ND	ug/L	10
1,3-Dichlorobenzene	ND	ug/L	10
1,4-Dichlorobenzene	ND	ug/L	10
3,3'-Dichlorobenzidine	ND	ug/L	20
2,4-Dichlorophenol	ND	ug/L	10
2,6-Dichlorophenol	ND	ug/L	10
Diethyl phthalate	ND	ug/L	10

(continued on following page)

ND = Not detected  
NA = Not applicable

Reported By: Bob Martin

Approved By: Jeff Lowry

Semivolatile Organics  
Appendix IX List  
Method 8270

Client Name: U.S. Geological Survey  
Client ID: KAFB090210-2  
Lab ID: 012743-0001-SA  
Matrix: AQUEOUS  
Authorized: 07 DEC 90

Sampled: 06 DEC 90  
Prepared: 11 DEC 90

Received: 07 DEC 90  
Analyzed: 01 JAN 91

Parameter	Result	Units	Reporting Limit
Dimethoate	ND	ug/L	--
p-Dimethylaminoazobenzene	ND	ug/L	10
7,12-Dimethylbenz(a)-anthracene	ND	ug/L	10
3,3'-Dimethylbenzidine	ND	ug/L	10
a,a-Dimethylphenethylamine	ND	ug/L	10
2,4-Dimethylphenol	ND	ug/L	10
Dimethyl phthalate	ND	ug/L	10
1,3-Dinitrobenzene	ND	ug/L	10
4,6-Dinitro-2-methylphenol	ND	ug/L	50
2,4-Dinitrophenol	ND	ug/L	50
2,4-Dinitrotoluene	ND	ug/L	10
2,6-Dinitrotoluene	ND	ug/L	10
Di-n-octyl phthalate	ND	ug/L	10
Diphenylamine	ND	ug/L	10
Disulfoton	ND	ug/L	50
bis(2-Ethylhexyl) phthalate	ND	ug/L	10
Ethyl methanesulfonate	ND	ug/L	10
Famphur	ND	ug/L	--
Fluoranthene	ND	ug/L	10
Fluorene	ND	ug/L	10
Hexachlorobenzene	ND	ug/L	10
Hexachlorobutadiene	ND	ug/L	10
Hexachlorocyclopentadiene	ND	ug/L	10
Hexachloroethane	ND	ug/L	10
Hexachlorophene	ND	ug/L	--
Hexachloropropene	ND	ug/L	10
Indeno(1,2,3-cd)pyrene	ND	ug/L	10
Isophorone	ND	ug/L	10
Isosafrole	ND	ug/L	20
Methapyrilene	ND	ug/L	10
3-Methylcholanthrene	ND	ug/L	10
Methyl methanesulfonate	ND	ug/L	10
2-Methylnaphthalene	ND	ug/L	10
Methyl parathion	ND	ug/L	50
2-Methylphenol	ND	ug/L	10
3/4-Methylphenol	ND	ug/L	10
Naphthalene	ND	ug/L	10

(continued on following page)

ND = Not detected  
NA = Not applicable

Reported By: Bob Martin

Approved By: Jeff Lowry

Semivolatile Organics  
Appendix IX List  
Method 8270

Client Name: U.S. Geological Survey  
Client ID: KAFB090210-2  
Lab ID: 012743-0001-SA  
Matrix: AQUEOUS  
Authorized: 07 DEC 90

Sampled: 06 DEC 90  
Prepared: 11 DEC 90

Received: 07 DEC 90  
Analyzed: 01 JAN 91

Parameter	Result	Units	Reporting Limit
1,4-Naphthoquinone	ND	ug/L	10
1-Naphthylamine	ND	ug/L	10
2-Naphthylamine	ND	ug/L	10
2-Nitroaniline	ND	ug/L	50
3-Nitroaniline	ND	ug/L	50
4-Nitroaniline	ND	ug/L	50
Nitrobenzene	ND	ug/L	10
2-Nitrophenol	ND	ug/L	10
4-Nitrophenol	ND	ug/L	50
4-Nitroquinoline-1-oxide	ND	ug/L	--
N-Nitroso-di-n-butylamine	ND	ug/L	10
N-Nitrosodiethylamine	ND	ug/L	10
N-Nitrosodimethylamine	ND	ug/L	10
N-Nitrosodiphenylamine	ND	ug/L	10
N-Nitroso-di-n-propylamine	ND	ug/L	10
N-Nitrosomethylethylamine	ND	ug/L	10
N-Nitrosomorpholine	ND	ug/L	10
N-Nitrosopiperidine	ND	ug/L	10
N-Nitrosopyrrolidine	ND	ug/L	10
5-Nitro-o-toluidine	ND	ug/L	10
Parathion	ND	ug/L	50
Pentachlorobenzene	ND	ug/L	10
Pentachloroethane	ND	ug/L	10
Pentachloronitrobenzene	ND	ug/L	50
Pentachlorophenol	ND	ug/L	50
Phenacetin	ND	ug/L	10
Phenanthrene	ND	ug/L	10
Phenol	ND	ug/L	10
4-Phenylenediamine	ND	ug/L	--
Phorate	ND	ug/L	100
2-Picoline	ND	ug/L	10
Pronamide	ND	ug/L	10
Pyrene	ND	ug/L	10
Pyridine	ND	ug/L	20
Safrole	ND	ug/L	10
Sulfotepp	ND	ug/L	50
1,2,4,5-Tetrachloro-benzene	ND	ug/L	10
2,3,4,6-Tetrachlorophenol	ND	ug/L	50
Thionazin	ND	ug/L	50

(continued on following page)

ND = Not detected  
NA = Not applicable

Reported By: Bob Martin

Approved By: Jeff Lowry

Semivolatile Organics  
Appendix IX List  
Method 8270

Client Name: U.S. Geological Survey  
Client ID: KAFB090210-2  
Lab ID: 012743-0001-SA  
Matrix: AQUEOUS  
Authorized: 07 DEC 90

Sampled: 06 DEC 90  
Prepared: 11 DEC 90

Received: 07 DEC 90  
Analyzed: 01 JAN 91

Parameter	Result	Units	Reporting Limit
2-Toluidine	ND	ug/L	10
1,2,4-Trichlorobenzene	ND	ug/L	10
2,4,5-Trichlorophenol	ND	ug/L	50
2,4,6-Trichlorophenol	ND	ug/L	10
0,0,0-Triethylphosphorothioate	ND	ug/L	10
1,3,5-Trinitrobenzene	ND	ug/L	10
Surrogate	Recovery		
Nitrobenzene-d5	73	%	--
2-Fluorobiphenyl	65	%	--
Terphenyl-d14	63	%	--
Phenol-d5	65	%	--
2-Fluorophenol	65	%	--
2,4,6-Tribromophenol	69	%	--

ND = Not detected  
NA = Not applicable

Reported By: Bob Martin

Approved By: Jeff Lowry

TENTATIVELY IDENTIFIED COMPOUNDS

FOR

U.S. GEOLOGICAL SURVEY

SAMPLE NUMBER 012743-0001

<u>Compound Name</u>	<u>Fraction</u>	<u>Confidence Level</u>	<u>Estimated Concentration ug/L</u>
Cyclohexene	BNA	1	590

NOTES:

Confidence Levels

- Level 3 - Confirmed Identification
- Level 2 - Confident Identification
- Level 1 - Tentative Identification

Please refer to the discussion for further details.



Semivolatile Organics  
Appendix IX List  
Method 8270

Client Name: U.S. Geological Survey  
Client ID: KAFB090209-2  
Lab ID: 012743-0002-SA  
Matrix: AQUEOUS  
Authorized: 07 DEC 90

Sampled: 06 DEC 90  
Prepared: 11 DEC 90

Received: 07 DEC 90  
Analyzed: 01 JAN 91

Parameter	Result	Units	Reporting Limit
Acenaphthene	ND	ug/L	10
Acenaphthylene	ND	ug/L	10
Acetophenone	ND	ug/L	10
2-Acetylaminofluorene	ND	ug/L	100
4-Aminobiphenyl	ND	ug/L	10
Aniline	ND	ug/L	10
Anthracene	ND	ug/L	10
Aramite	ND	ug/L	10
Benzo(a)anthracene	ND	ug/L	10
Benzo(b)fluoranthene	ND	ug/L	10
Benzo(k)fluoranthene	ND	ug/L	10
Benzo(g,h,i)perylene	ND	ug/L	10
Benzo(a)pyrene	ND	ug/L	10
Benzyl alcohol	ND	ug/L	10
4-Bromophenyl phenyl ether	ND	ug/L	10
Butyl benzyl phthalate	ND	ug/L	10
2-sec-Butyl-4,6-dinitro- phenol	ND	ug/L	10
4-Chloroaniline	ND	ug/L	10
bis(2-Chloroethoxy)- methane	ND	ug/L	10
bis(2-Chloroethyl) ether	ND	ug/L	10
bis(2-Chloroisopropyl)- ether	ND	ug/L	10
4-Chloro-3-methylphenol	ND	ug/L	10
2-Chloronaphthalene	ND	ug/L	10
2-Chlorophenol	ND	ug/L	10
4-Chlorophenyl phenyl ether	ND	ug/L	10
Chrysene	ND	ug/L	10
Dibenz(a,h)anthracene	ND	ug/L	10
Dibenzofuran	ND	ug/L	10
Di-n-butyl phthalate	16	ug/L	10
1,2-Dichlorobenzene	ND	ug/L	10
1,3-Dichlorobenzene	ND	ug/L	10
1,4-Dichlorobenzene	ND	ug/L	10
3,3'-Dichlorobenzidine	ND	ug/L	20
2,4-Dichlorophenol	ND	ug/L	10
2,6-Dichlorophenol	ND	ug/L	10
Diethyl phthalate	ND	ug/L	10

(continued on following page)

ND = Not detected  
NA = Not applicable

Reported By: Bob Martin

Approved By: Jeff Lowry

Semivolatile Organics  
Appendix IX List  
Method 8270

Client Name: U.S. Geological Survey  
Client ID: KAFB090209-2  
Lab ID: 012743-0002-SA  
Matrix: AQUEOUS  
Authorized: 07 DEC 90

Sampled: 06 DEC 90  
Prepared: 11 DEC 90

Received: 07 DEC 90  
Analyzed: 01 JAN 91

Parameter	Result	Units	Reporting Limit
Dimethoate	ND	ug/L	--
p-Dimethylaminoazobenzene	ND	ug/L	10
7,12-Dimethylbenz(a)-anthracene	ND	ug/L	10
3,3'-Dimethylbenzidine	ND	ug/L	10
a,a-Dimethylphenethylamine	ND	ug/L	10
2,4-Dimethylphenol	ND	ug/L	10
Dimethyl phthalate	ND	ug/L	10
1,3-Dinitrobenzene	ND	ug/L	10
4,6-Dinitro-2-methylphenol	ND	ug/L	50
2,4-Dinitrophenol	ND	ug/L	50
2,4-Dinitrotoluene	ND	ug/L	10
2,6-Dinitrotoluene	ND	ug/L	10
Di-n-octyl phthalate	ND	ug/L	10
Diphenylamine	ND	ug/L	10
Disulfoton	ND	ug/L	50
bis(2-Ethylhexyl) phthalate	ND	ug/L	10
Ethyl methanesulfonate	ND	ug/L	10
Famphur	ND	ug/L	--
Fluoranthene	ND	ug/L	10
Fluorene	ND	ug/L	10
Hexachlorobenzene	ND	ug/L	10
Hexachlorobutadiene	ND	ug/L	10
Hexachlorocyclopentadiene	ND	ug/L	10
Hexachloroethane	ND	ug/L	10
Hexachlorophene	ND	ug/L	--
Hexachloropropene	ND	ug/L	10
Indeno(1,2,3-cd)pyrene	ND	ug/L	10
Isophorone	ND	ug/L	10
Isosafrole	ND	ug/L	20
Methapyrilene	ND	ug/L	10
3-Methylcholanthrene	ND	ug/L	10
Methyl methanesulfonate	ND	ug/L	10
2-Methylnaphthalene	ND	ug/L	10
Methyl parathion	ND	ug/L	50
2-Methylphenol	ND	ug/L	10
3/4-Methylphenol	ND	ug/L	10
Naphthalene	ND	ug/L	10

(continued on following page)

ND = Not detected  
NA = Not applicable

Reported By: Bob Martin

Approved By: Jeff Lowry

Semivolatile Organics  
Appendix IX List  
Method 8270

Client Name: U.S. Geological Survey

Client ID: KAFB090209-2

Lab ID: 012743-0002-SA

Matrix: AQUEOUS

Authorized: 07 DEC 90

Sampled: 06 DEC 90

Prepared: 11 DEC 90

Received: 07 DEC 90

Analyzed: 01 JAN 91

Parameter	Result	Units	Reporting Limit
1,4-Naphthoquinone	ND	ug/L	10
1-Naphthylamine	ND	ug/L	10
2-Naphthylamine	ND	ug/L	10
2-Nitroaniline	ND	ug/L	50
3-Nitroaniline	ND	ug/L	50
4-Nitroaniline	ND	ug/L	50
Nitrobenzene	ND	ug/L	10
2-Nitrophenol	ND	ug/L	10
4-Nitrophenol	ND	ug/L	50
4-Nitroquinoline-1-oxide	ND	ug/L	--
N-Nitroso-di-n-butylamine	ND	ug/L	10
N-Nitrosodiethylamine	ND	ug/L	10
N-Nitrosodimethylamine	ND	ug/L	10
N-Nitrosodiphenylamine	ND	ug/L	10
N-Nitroso-di-n-propylamine	ND	ug/L	10
N-Nitrosomethylethylamine	ND	ug/L	10
N-Nitrosomorpholine	ND	ug/L	10
N-Nitrosopiperidine	ND	ug/L	10
N-Nitrosopyrrolidine	ND	ug/L	10
5-Nitro-o-toluidine	ND	ug/L	10
Parathion	ND	ug/L	50
Pentachlorobenzene	ND	ug/L	10
Pentachloroethane	ND	ug/L	10
Pentachloronitrobenzene	ND	ug/L	50
Pentachlorophenol	ND	ug/L	50
Phenacetin	ND	ug/L	10
Phenanthrene	ND	ug/L	10
Phenol	ND	ug/L	10
4-Phenylenediamine	ND	ug/L	--
Phorate	ND	ug/L	100
2-Picoline	ND	ug/L	10
Pronamide	ND	ug/L	10
Pyrene	ND	ug/L	10
Pyridine	ND	ug/L	20
Safrole	ND	ug/L	10
Sulfotepp	ND	ug/L	50
1,2,4,5-Tetrachloro-benzene	ND	ug/L	10
2,3,4,6-Tetrachlorophenol	ND	ug/L	50
Thionazin	ND	ug/L	50

(continued on following page)

ND = Not detected  
NA = Not applicable

Reported By: Bob Martin

Approved By: Jeff Lowry

Semivolatile Organics  
Appendix IX List  
Method 8270

Client Name: U.S. Geological Survey  
Client ID: KAFB090209-2  
Lab ID: 012743-0002-SA  
Matrix: AQUEOUS  
Authorized: 07 DEC 90

Sampled: 06 DEC 90  
Prepared: 11 DEC 90

Received: 07 DEC 90  
Analyzed: 01 JAN 91

Parameter	Result	Units	Reporting Limit
2-Toluidine	ND	ug/L	10
1,2,4-Trichlorobenzene	ND	ug/L	10
2,4,5-Trichlorophenol	ND	ug/L	50
2,4,6-Trichlorophenol	ND	ug/L	10
0,0,0-Triethylphosphorothioate	ND	ug/L	10
1,3,5-Trinitrobenzene	ND	ug/L	10
Surrogate	Recovery		
Nitrobenzene-d5	74	%	--
2-Fluorobiphenyl	61	%	--
Terphenyl-d14	58	%	--
Phenol-d5	66	%	--
2-Fluorophenol	70	%	--
2,4,6-Tribromophenol	70	%	--

ND = Not detected  
NA = Not applicable

Reported By: Bob Martin

Approved By: Jeff Lowry

TENTATIVELY IDENTIFIED COMPOUNDS

FOR

U.S. GEOLOGICAL SURVEY

SAMPLE NUMBER 012743-0002

<u>Compound Name</u>	<u>Fraction</u>	<u>Confidence Level</u>	<u>Estimated Concentration ug/L</u>
None Detected	BNA		

NOTES:

Confidence Levels

- Level 3 - Confirmed Identification
- Level 2 - Confident Identification
- Level 1 - Tentative Identification

Please refer to the discussion for further details.

Appendix IX Dioxins/Furans

Low Resolution

Client Name: U.S. Geological Survey

Client ID: KAFB090210-2

Lab ID: 012743-0001-SA

Matrix: AQUEOUS

Authorized: 07 DEC 90

Sampled: 06 DEC 90

Prepared: 10 DEC 90

Received: 07 DEC 90

Analyzed: 03 JAN 91

Sample Amount 500 MLS

Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
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Furans

TCDFs (total)	ND	ng/L	0.10	
PeCDFs (total)	ND	ng/L	0.12	
HxCDFs (total)	ND	ng/L	0.29	

Dioxins

TCDDs (total)	ND	ng/L	0.13	
2,3,7,8-TCDD	ND	ng/L	0.13	
PeCDDs (total)	ND	ng/L	0.20	
HxCDDs (total)	ND	ng/L	0.37	

% Recovery

13C-2,3,7,8-TCDF	93
13C-2,3,7,8-TCDD	92
13C-1,2,3,7,8-PeCDD	86
13C-1,2,3,6,7,8-HxCDD	99

ND = Not detected  
NA = Not applicable

Reported By: Bob Martin

Approved By: Jeff Lowry

Appendix IX Dioxins/Furans

Low Resolution

Client Name: U.S. Geological Survey  
 Client ID: KAFB090209-2  
 Lab ID: 012743-0002-SA  
 Matrix: AQUEOUS  
 Authorized: 07 DEC 90  
 Sampled: 06 DEC 90  
 Prepared: 10 DEC 90  
 Received: 07 DEC 90  
 Analyzed: 03 JAN 91

Sample Amount 500 MLS  
 Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
<b>Furans</b>				
TCDFs (total)	ND	ng/L	0.085	
PeCDFs (total)	ND	ng/L	0.14	
HxCDFs (total)	ND	ng/L	0.27	
<b>Dioxins</b>				
TCDDs (total)	ND	ng/L	0.16	
2,3,7,8-TCDD	ND	ng/L	0.16	
PeCDDs (total)	ND	ng/L	0.21	
HxCDDs (total)	ND	ng/L	0.40	
<b>% Recovery</b>				
13C-2,3,7,8-TCDF	82			
13C-2,3,7,8-TCDD	78			
13C-1,2,3,7,8-PeCDD	74			
13C-1,2,3,6,7,8-HxCDD	76			

ND = Not detected  
 NA = Not applicable

Reported By: Bob Martin

Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: U.S. Geological Survey  
 Client ID: KAFB090210-2  
 Lab ID: 012743-0001-SA  
 Matrix: AQUEOUS  
 Authorized: 07 DEC 90

Sampled: 06 DEC 90  
 Prepared: NA

Received: 07 DEC 90  
 Analyzed: 11 DEC 90

Parameter	Result	Units	Reporting Limit	
Chloromethane	ND	ug/L	1.1	T
Bromomethane	ND	ug/L	6.0	
Dichlorodifluoromethane	ND	ug/L	9.0	
Vinyl chloride	ND	ug/L	0.60	
Chloroethane	ND	ug/L	3.0	
Methylene chloride	ND	ug/L	2.0	
Trichlorofluoromethane	ND	ug/L	5.0	
1,1-Dichloroethene	ND	ug/L	0.70	
1,1-Dichloroethane	ND	ug/L	0.40	
trans-1,2-Dichloroethene	ND	ug/L	0.50	
Chloroform	0.36	ug/L	0.30	
1,2-Dichloroethane	ND	ug/L	0.50	
1,1,1-Trichloroethane	ND	ug/L	0.20	
Carbon tetrachloride	ND	ug/L	0.60	
Bromodichloromethane	ND	ug/L	0.50	
1,2-Dichloropropane	ND	ug/L	0.50	
trans-1,3-Dichloropropene	ND	ug/L	2.0	
Trichloroethene	ND	ug/L	0.60	
Dibromochloromethane	ND	ug/L	0.60	
1,1,2-Trichloroethane	ND	ug/L	0.20	
2-Chloroethyl vinyl ether	ND	ug/L	5.5	
Bromoform	ND	ug/L	1.0	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.4	
Tetrachloroethene	ND	ug/L	0.40	
Chlorobenzene	ND	ug/L	1.2	
1,3-Dichlorobenzene	ND	ug/L	1.0	
1,2-Dichlorobenzene	ND	ug/L	0.50	
1,4-Dichlorobenzene	ND	ug/L	0.50	
Benzyl chloride	ND	ug/L	6.8	
Bromobenzene	ND	ug/L	5.0	
bis(2-Chloroisopropyl)- ether	ND	ug/L	10	
1-Chlorohexane	ND	ug/L	5.0	
4-Chlorotoluene	ND	ug/L	23	
Dibromomethane	ND	ug/L	5.0	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	
1,2,3-Trichloropropane	ND	ug/L	5.0	

Surrogate	Recovery		
Bromochloromethane	96	%	--

(continued on following page)

ND = Not detected  
 NA = Not applicable

Reported By: Garth Atkins

Approved By: Jeff Lowry



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Halogenated Volatile Organics (CONT.)

Method 8010

Client Name: U.S. Geological Survey

Client ID: KAFB090210-2

Lab ID: 012743-0001-SA

Matrix: AQUEOUS

Authorized: 07 DEC 90

Sampled: 06 DEC 90

Prepared: NA

Received: 07 DEC 90

Analyzed: 11 DEC 90

Note T : Preferred values unless footnoted on secondary column test.

ND = Not detected

NA = Not applicable

Reported By: Garth Atkins

Approved By: Jeff Lowry

Halogenated Volatile Organics-2nd Column Analysis

Method 8010

Client Name: U.S. Geological Survey  
Client ID: KAFB090210-2  
Lab ID: 012743-0001-SA  
Matrix: AQUEOUS  
Authorized: 07 DEC 90

Sampled: 06 DEC 90  
Prepared: NA

Received: 07 DEC 90  
Analyzed: 11 DEC 90

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	1.1
Bromomethane	ND	ug/L	6.0
Dichlorodifluoromethane	ND	ug/L	9.0
Vinyl chloride	ND	ug/L	0.60
Chloroethane	ND	ug/L	3.0
Methylene chloride	ND	ug/L	2.0
Trichlorofluoromethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.70
1,1-Dichloroethane	ND	ug/L	0.40
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	0.83	ug/L	0.30
1,2-Dichloroethane	ND	ug/L	0.50
1,1,1-Trichloroethane	ND	ug/L	0.20
Carbon tetrachloride	ND	ug/L	0.60
Bromodichloromethane	ND	ug/L	0.50
1,2-Dichloropropane	ND	ug/L	0.50
trans-1,3-Dichloropropene	ND	ug/L	2.0
Trichloroethene	ND	ug/L	0.60
Dibromochloromethane	ND	ug/L	0.60
1,1,2-Trichloroethane	ND	ug/L	0.20
2-Chloroethyl vinyl ether	ND	ug/L	5.5
Bromoform	ND	ug/L	1.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.4
Tetrachloroethene	ND	ug/L	0.40
Chlorobenzene	ND	ug/L	1.2
1,3-Dichlorobenzene	ND	ug/L	1.0
1,2-Dichlorobenzene	ND	ug/L	0.50
1,4-Dichlorobenzene	ND	ug/L	0.50
Benzyl chloride	ND	ug/L	6.8
Bromobenzene	ND	ug/L	5.0
bis(2-Chloroisopropyl)- ether	ND	ug/L	10
1-Chlorohexane	ND	ug/L	5.0
4-Chlorotoluene	ND	ug/L	23
Dibromomethane	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0

Surrogate	Recovery		
Bromochloromethane	110	%	--

ND = Not detected  
NA = Not applicable

Reported By: Garth Atkins

Approved By: Jeff Lowry

Halogenated Volatile Organics

Method 8010

Client Name: U.S. Geological Survey  
 Client ID: KAFB090209-2  
 Lab ID: 012743-0002-SA  
 Matrix: AQUEOUS  
 Authorized: 07 DEC 90

Sampled: 06 DEC 90  
 Prepared: NA

Received: 07 DEC 90  
 Analyzed: 11 DEC 90

Parameter	Result	Units	Reporting Limit	
Chloromethane	ND	ug/L	1.1	T
Bromomethane	ND	ug/L	6.0	
Dichlorodifluoromethane	ND	ug/L	9.0	
Vinyl chloride	ND	ug/L	0.60	
Chloroethane	ND	ug/L	3.0	
Methylene chloride	ND	ug/L	2.0	
Trichlorofluoromethane	ND	ug/L	5.0	
1,1-Dichloroethene	ND	ug/L	0.70	
1,1-Dichloroethane	ND	ug/L	0.40	
trans-1,2-Dichloroethene	ND	ug/L	0.50	
Chloroform	ND	ug/L	0.30	
1,2-Dichloroethane	0.64	ug/L	0.50	
1,1,1-Trichloroethane	ND	ug/L	0.20	
Carbon tetrachloride	ND	ug/L	0.60	
Bromodichloromethane	ND	ug/L	0.50	
1,2-Dichloropropane	ND	ug/L	0.50	
trans-1,3-Dichloropropene	ND	ug/L	2.0	
Trichloroethene	0.90	ug/L	0.60	
Dibromochloromethane	ND	ug/L	0.60	
1,1,2-Trichloroethane	ND	ug/L	0.20	
2-Chloroethyl vinyl ether	ND	ug/L	5.5	
Bromoform	ND	ug/L	1.0	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.4	
Tetrachloroethene	ND	ug/L	0.40	
Chlorobenzene	ND	ug/L	1.2	
1,3-Dichlorobenzene	ND	ug/L	1.0	
1,2-Dichlorobenzene	ND	ug/L	0.50	
1,4-Dichlorobenzene	ND	ug/L	0.50	
Benzyl chloride	ND	ug/L	6.8	
Bromobenzene	ND	ug/L	5.0	
bis(2-Chloroisopropyl)- ether	ND	ug/L	10	
1-Chlorohexane	ND	ug/L	5.0	
4-Chlorotoluene	ND	ug/L	23	
Dibromomethane	ND	ug/L	5.0	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	
1,2,3-Trichloropropane	ND	ug/L	5.0	

Surrogate	Recovery		
Bromochloromethane	90	%	--

(continued on following page)

ND = Not detected  
 NA = Not applicable

Reported By: Garth Atkins

Approved By: Jeff Lowry

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Halogenated Volatile Organics (CONT.)

Method 8010

Client Name: U.S. Geological Survey  
Client ID: KAFB090209-2  
Lab ID: 012743-0002-SA  
Matrix: AQUEOUS  
Authorized: 07 DEC 90

Sampled: 06 DEC 90  
Prepared: NA

Received: 07 DEC 90  
Analyzed: 11 DEC 90

Note T : Preferred values unless footnoted on secondary column test.

ND = Not detected  
NA = Not applicable

Reported By: Garth Atkins

Approved By: Jeff Lowry

Halogenated Volatile Organics-2nd Column Analysis

Method 8010

Client Name: U.S. Geological Survey  
 Client ID: KAFB090209-2  
 Lab ID: 012743-0002-SA  
 Matrix: AQUEOUS  
 Authorized: 07 DEC 90

Sampled: 06 DEC 90  
 Prepared: NA

Received: 07 DEC 90  
 Analyzed: 11 DEC 90

Parameter	Result	Units	Reporting Limit	
Chloromethane	ND	ug/L	1.1	
Bromomethane	ND	ug/L	6.0	
Dichlorodifluoromethane	ND	ug/L	9.0	
Vinyl chloride	ND	ug/L	0.60	
Chloroethane	ND	ug/L	3.0	
Methylene chloride	ND	ug/L	2.0	
Trichlorofluoromethane	ND	ug/L	5.0	
1,1-Dichloroethene	ND	ug/L	0.70	
1,1-Dichloroethane	ND	ug/L	0.40	
trans-1,2-Dichloroethene	ND	ug/L	0.50	
Chloroform	0.36	ug/L	0.30	
1,2-Dichloroethane	0.76	ug/L	0.50	
1,1,1-Trichloroethane	ND	ug/L	0.20	
Carbon tetrachloride	ND	ug/L	0.60	
Bromodichloromethane	1.0	ug/L	0.50	L
1,2-Dichloropropane	ND	ug/L	0.50	
trans-1,3-Dichloropropene	ND	ug/L	2.0	
Trichloroethene	1.0	ug/L	0.60	L
Dibromochloromethane	ND	ug/L	0.60	
1,1,2-Trichloroethane	ND	ug/L	0.20	
2-Chloroethyl vinyl ether	ND	ug/L	5.5	
Bromoform	ND	ug/L	1.0	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.4	
Tetrachloroethene	ND	ug/L	0.40	
Chlorobenzene	ND	ug/L	1.2	
1,3-Dichlorobenzene	ND	ug/L	1.0	
1,2-Dichlorobenzene	ND	ug/L	0.50	
1,4-Dichlorobenzene	ND	ug/L	0.50	
Benzyl chloride	ND	ug/L	6.8	
Bromobenzene	ND	ug/L	5.0	
bis(2-Chloroisopropyl)- ether	ND	ug/L	10	
1-Chlorohexane	ND	ug/L	5.0	
4-Chlorotoluene	ND	ug/L	23	
Dibromomethane	ND	ug/L	5.0	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	
1,2,3-Trichloropropane	ND	ug/L	5.0	

Surrogate	Recovery		
Bromochloromethane	96	%	--

(continued on following page)

ND = Not detected  
 NA = Not applicable

Reported By: Garth Atkins

Approved By: Jeff Lowry

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Halogenated Volatile Organics-2nd Column Analysis (CONT.)

Method 8010

Client Name: U.S. Geological Survey  
Client ID: KAFB090209-2  
Lab ID: 012743-0002-SA  
Matrix: AQUEOUS  
Authorized: 07 DEC 90

Sampled: 06 DEC 90  
Prepared: NA

Received: 07 DEC 90  
Analyzed: 11 DEC 90

Note L : These components are not separable using this method and are therefore quantified together.

ND = Not detected  
NA = Not applicable

Reported By: Garth Atkins

Approved By: Jeff Lowry

Chlorinated Pesticides and PCB's  
Appendix IX List  
Method 8080

Client Name: U.S. Geological Survey  
Client ID: KAFB090210-2  
Lab ID: 012743-0001-SA  
Matrix: AQUEOUS  
Authorized: 07 DEC 90

Sampled: 06 DEC 90  
Prepared: 11 DEC 90

Received: 07 DEC 90  
Analyzed: 19 DEC 90

Parameter	Result	Units	Reporting Limit
Aldrin	ND	ug/L	0.050
Aroclor 1016	ND	ug/L	1.0
Aroclor 1221	ND	ug/L	1.0
Aroclor 1232	ND	ug/L	1.0
Aroclor 1242	ND	ug/L	1.0
Aroclor 1248	ND	ug/L	1.0
Aroclor 1254	ND	ug/L	1.0
Aroclor 1260	ND	ug/L	1.0
alpha-BHC	ND	ug/L	0.050
beta-BHC	ND	ug/L	0.050
delta-BHC	ND	ug/L	0.050
gamma-BHC (Lindane)	ND	ug/L	0.050
alpha-Chlordane	ND	ug/L	0.050
gamma-Chlordane	ND	ug/L	0.050
Chlorobenzilate	ND	ug/L	0.10
4,4'-DDD	ND	ug/L	0.10
4,4'-DDE	ND	ug/L	0.10
4,4'-DDT	ND	ug/L	0.10
Diallate	ND	ug/L	1.0
Dieldrin	ND	ug/L	0.10
Endosulfan I	ND	ug/L	0.050
Endosulfan II	ND	ug/L	0.10
Endosulfan sulfate	ND	ug/L	0.10
Endrin	ND	ug/L	0.10
Endrin aldehyde	ND	ug/L	0.10
Heptachlor	ND	ug/L	0.050
Heptachlor epoxide	ND	ug/L	0.050
Isodrin	ND	ug/L	0.10
Kepone	ND	ug/L	1.0
Methoxychlor	ND	ug/L	0.50
Toxaphene	ND	ug/L	5.0

Surrogate	Recovery		
Dibutyl chlorendate	52	%	--

ND = Not detected  
NA = Not applicable

Reported By: Ann Steyert

Approved By: Jeff Lowry

Chlorinated Pesticides and PCB's  
Appendix IX List  
Method 8080

Client Name: U.S. Geological Survey  
Client ID: KAFB090209-2  
Lab ID: 012743-0002-SA  
Matrix: AQUEOUS  
Authorized: 07 DEC 90

Sampled: 06 DEC 90  
Prepared: 11 DEC 90

Received: 07 DEC 90  
Analyzed: 19 DEC 90

Parameter	Result	Units	Reporting Limit
Aldrin	ND	ug/L	0.050
Aroclor 1016	ND	ug/L	1.0
Aroclor 1221	ND	ug/L	1.0
Aroclor 1232	ND	ug/L	1.0
Aroclor 1242	ND	ug/L	1.0
Aroclor 1248	ND	ug/L	1.0
Aroclor 1254	ND	ug/L	1.0
Aroclor 1260	ND	ug/L	1.0
alpha-BHC	ND	ug/L	0.050
beta-BHC	ND	ug/L	0.050
delta-BHC	ND	ug/L	0.050
gamma-BHC (Lindane)	ND	ug/L	0.050
alpha-Chlordane	ND	ug/L	0.050
gamma-Chlordane	ND	ug/L	0.050
Chlorobenzilate	ND	ug/L	0.10
4,4'-DDD	ND	ug/L	0.10
4,4'-DDE	ND	ug/L	0.10
4,4'-DDT	ND	ug/L	0.10
Diallate	ND	ug/L	1.0
Dieldrin	ND	ug/L	0.10
Endosulfan I	ND	ug/L	0.050
Endosulfan II	ND	ug/L	0.10
Endosulfan sulfate	ND	ug/L	0.10
Endrin	ND	ug/L	0.10
Endrin aldehyde	ND	ug/L	0.10
Heptachlor	ND	ug/L	0.050
Heptachlor epoxide	ND	ug/L	0.050
Isodrin	ND	ug/L	0.10
Kepone	ND	ug/L	1.0
Methoxychlor	ND	ug/L	0.50
Toxaphene	ND	ug/L	5.0
Surrogate	Recovery		
Dibutyl chlorendate	71	%	--

ND = Not detected  
NA = Not applicable

Reported By: Ann Steyert

Approved By: Jeff Lowry



Appendix IX Herbicides

Method 8150

Client Name: U.S. Geological Survey  
 Client ID: KAFB090210-2  
 Lab ID: 012743-0001-SA  
 Matrix: AQUEOUS  
 Authorized: 07 DEC 90

Sampled: 06 DEC 90  
 Prepared: 11 DEC 90

Received: 07 DEC 90  
 Analyzed: 22 DEC 90

Parameter	Result	Units	Reporting Limit
2,4-D	ND	ug/L	1.2
2,4,5-T	ND	ug/L	0.20
2,4,5-TP (Silvex)	ND	ug/L	0.17
Surrogate	Recovery		
DCAA	96	%	

ND = Not detected  
 NA = Not applicable

Reported By: Stan Dunlavy

Approved By: Jeff Lowry

Appendix IX Herbicides

Method 8150

Client Name: U.S. Geological Survey

Client ID: KAFB090209-2

Lab ID: 012743-0002-SA

Matrix: AQUEOUS

Authorized: 07 DEC 90

Sampled: 06 DEC 90

Prepared: 11 DEC 90

Received: 07 DEC 90

Analyzed: 22 DEC 90

Parameter	Result	Units	Reporting Limit
2,4-D	ND	ug/L	1.2
2,4,5-T	ND	ug/L	0.20
2,4,5-TP (Silvex)	ND	ug/L	0.17
Surrogate	Recovery		
DCAA	71	%	

ND = Not detected  
NA = Not applicable

Reported By: Stan Dunlavy

Approved By: Jeff Lowry

Metals

Total Metals

Client Name: U.S. Geological Survey  
 Client ID: KAFB090210-2  
 Lab ID: 012743-0001-SA  
 Matrix: AQUEOUS  
 Authorized: 07 DEC 90

Sampled: 06 DEC 90  
 Prepared: See Below

Received: 07 DEC 90  
 Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	24 JAN 91	25 JAN 91
Chromium	0.0093	mg/L	0.0010	7191	24 JAN 91	22 JAN 91
Arsenic	0.0059	mg/L	0.0050	7060	21 JAN 91	22 JAN 91
Barium	ND	mg/L	0.010	6010	24 JAN 91	25 JAN 91
Beryllium	ND	mg/L	0.0020	6010	24 JAN 91	25 JAN 91
Cadmium	ND	mg/L	0.0050	6010	24 JAN 91	25 JAN 91
Chromium	0.015	mg/L	0.010	6010	24 JAN 91	25 JAN 91
Cobalt	ND	mg/L	0.010	6010	24 JAN 91	25 JAN 91
Copper	ND	mg/L	0.020	6010	24 JAN 91	25 JAN 91
Lead	ND	mg/L	0.0050	7421	21 JAN 91	22 JAN 91
Mercury	ND	mg/L	0.00020	7470	02 JAN 91	02 JAN 91
Nickel	ND	mg/L	0.040	6010	24 JAN 91	25 JAN 91
Selenium	ND	mg/L	0.0050	7740	21 JAN 91	22 JAN 91
Silver	ND	mg/L	0.010	6010	24 JAN 91	25 JAN 91
Thallium	ND	mg/L	0.0050	7841	21 JAN 91	22 JAN 91
Tin	ND	mg/L	0.10	6010	24 JAN 91	25 JAN 91
Vanadium	ND	mg/L	0.010	6010	24 JAN 91	25 JAN 91
Zinc	0.028	mg/L	0.020	6010	24 JAN 91	25 JAN 91

ND = Not detected  
 NA = Not applicable

Reported By: Sandra Jones

Approved By: John Laferty

Metals

Total Metals

Client Name: U.S. Geological Survey  
 Client ID: KAFB090209-2  
 Lab ID: 012743-0002-SA  
 Matrix: AQUEOUS  
 Authorized: 07 DEC 90

Sampled: 06 DEC 90  
 Prepared: See Below

Received: 07 DEC 90  
 Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	24 JAN 91	25 JAN 91
Chromium	0.013	mg/L	0.0010	7191	24 JAN 91	22 JAN 91
Arsenic	ND	mg/L	0.0050	7060	21 JAN 91	22 JAN 91
Barium	0.26	mg/L	0.010	6010	24 JAN 91	25 JAN 91
Beryllium	ND	mg/L	0.0020	6010	24 JAN 91	25 JAN 91
Cadmium	ND	mg/L	0.0050	6010	24 JAN 91	25 JAN 91
Chromium	0.038	mg/L	0.010	6010	24 JAN 91	25 JAN 91
Cobalt	ND	mg/L	0.010	6010	24 JAN 91	25 JAN 91
Copper	ND	mg/L	0.020	6010	24 JAN 91	25 JAN 91
Lead	0.0083	mg/L	0.0050	7421	21 JAN 91	22 JAN 91
Mercury	ND	mg/L	0.00020	7470	02 JAN 91	02 JAN 91
Nickel	ND	mg/L	0.040	6010	24 JAN 91	25 JAN 91
Selenium	ND	mg/L	0.010	7740	21 JAN 91	22 JAN 91
Silver	ND	mg/L	0.010	6010	24 JAN 91	25 JAN 91
Thallium	ND	mg/L	0.020	7841	21 JAN 91	22 JAN 91
Tin	ND	mg/L	0.10	6010	24 JAN 91	25 JAN 91
Vanadium	0.012	mg/L	0.010	6010	24 JAN 91	25 JAN 91
Zinc	0.16	mg/L	0.020	6010	24 JAN 91	25 JAN 91

ND = Not detected  
 NA = Not applicable

Reported By: Sandra Jones

Approved By: John Laferty

Metals

Dissolved Metals

Client Name: U.S. Geological Survey  
 Client ID: KAFB090210-2  
 Lab ID: 012743-0001-SA  
 Matrix: AQUEOUS  
 Authorized: 07 DEC 90

Sampled: 06 DEC 90  
 Prepared: See Below

Received: 07 DEC 90  
 Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	NA	22 JAN 91
Chromium	ND	mg/L	0.0010	7191	NA	21 JAN 91
Arsenic	0.0053	mg/L	0.0050	7060	NA	21 JAN 91
Barium	ND	mg/L	0.010	6010	NA	22 JAN 91
Beryllium	ND	mg/L	0.0020	6010	NA	22 JAN 91
Cadmium	ND	mg/L	0.0050	6010	NA	22 JAN 91
Chromium	ND	mg/L	0.010	6010	NA	22 JAN 91
Cobalt	ND	mg/L	0.010	6010	NA	22 JAN 91
Copper	ND	mg/L	0.020	6010	NA	22 JAN 91
Lead	ND	mg/L	0.0050	7421	NA	21 JAN 91
Mercury	ND	mg/L	0.00020	7470	28 DEC 90	28 DEC 90
Nickel	ND	mg/L	0.040	6010	NA	22 JAN 91
Selenium	ND	mg/L	0.0050	7740	NA	21 JAN 91
Silver	ND	mg/L	0.010	6010	NA	22 JAN 91
Thallium	ND	mg/L	0.0050	7841	NA	21 JAN 91
Tin	ND	mg/L	0.10	6010	NA	22 JAN 91
Vanadium	ND	mg/L	0.010	6010	NA	22 JAN 91
Zinc	ND	mg/L	0.020	6010	NA	22 JAN 91

ND = Not detected  
 NA = Not applicable

Reported By: Dan Appelhans

Approved By: John Laferty

Metals

Dissolved Metals

Client Name: U.S. Geological Survey  
 Client ID: KAFB090209-2  
 Lab ID: 012743-0002-SA  
 Matrix: AQUEOUS  
 Authorized: 07 DEC 90

Sampled: 06 DEC 90  
 Prepared: See Below

Received: 07 DEC 90  
 Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	NA	22 JAN 91
Chromium	0.014	mg/L	0.0010	7191	NA	21 JAN 91
Arsenic	ND	mg/L	0.0050	7060	NA	21 JAN 91
Barium	0.18	mg/L	0.010	6010	NA	22 JAN 91
Beryllium	ND	mg/L	0.0020	6010	NA	22 JAN 91
Cadmium	ND	mg/L	0.0050	6010	NA	22 JAN 91
Chromium	ND	mg/L	0.010	6010	NA	22 JAN 91
Cobalt	ND	mg/L	0.010	6010	NA	22 JAN 91
Copper	ND	mg/L	0.020	6010	NA	22 JAN 91
Lead	ND	mg/L	0.0050	7421	NA	21 JAN 91
Mercury	ND	mg/L	0.00020	7470	28 DEC 90	28 DEC 90
Nickel	ND	mg/L	0.040	6010	NA	22 JAN 91
Selenium	ND	mg/L	0.020	7740	NA	21 JAN 91
Silver	ND	mg/L	0.010	6010	NA	22 JAN 91
Thallium	ND	mg/L	0.010	7841	NA	21 JAN 91
Tin	ND	mg/L	0.10	6010	NA	22 JAN 91
Vanadium	ND	mg/L	0.010	6010	NA	22 JAN 91
Zinc	0.083	mg/L	0.020	6010	NA	22 JAN 91

ND = Not detected  
 NA = Not applicable

Reported By: Dan Appelhans

Approved By: John Laferty

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General Inorganics

Client Name: U.S. Geological Survey  
Client ID: KAFB090210-2  
Lab ID: 012743-0001-SA  
Matrix: AQUEOUS  
Authorized: 07 DEC 90

Sampled: 06 DEC 90  
Prepared: See Below

Received: 07 DEC 90  
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Cyanide	ND	mg/L	0.010	9012	NA	18 DEC 90
Nitrate plus Nitrite	ND	mg/L	0.050	353.2	NA	19 DEC 90
Sulfide, Total	ND	mg/L	0.050	376.2	NA	13 DEC 90
Total Organic Carbon	0.76	mg/L	0.50	9060	NA	18 DEC 90
Total Organic Halogen as Cl	ND	ug/L	30.0	9020	NA	19 DEC 90

ND = Not detected  
NA = Not applicable

Reported By: Steve Pope

Approved By: John Laferty

General Inorganics

Client Name: U.S. Geological Survey  
 Client ID: KAFB090209-2  
 Lab ID: 012743-0002-SA  
 Matrix: AQUEOUS  
 Authorized: 07 DEC 90

Sampled: 06 DEC 90  
 Prepared: See Below

Received: 07 DEC 90  
 Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Cyanide	ND	mg/L	0.010	9012	NA	18 DEC 90
Nitrate plus Nitrite	1.2	mg/L	0.10	353.2	NA	19 DEC 90
Sulfide, Total	0.053	mg/L	0.050	376.2	NA	13 DEC 90
Total Organic Carbon	0.91	mg/L	0.50	9060	NA	18 DEC 90
Total Organic Halogen as Cl	ND	ug/L	30.0	9020	NA	19 DEC 90

ND = Not detected  
 NA = Not applicable

Reported By: Steve Pope

Approved By: John Laferty



## Quality Control Results

The Enseco laboratories operate under a vigorous QA/QC program designed to ensure the generation of scientifically valid, legally defensible data by monitoring every aspect of laboratory operations. Routine QA/QC procedures include the use of approved methodologies, independent verification of analytical standards, use of duplicate Laboratory Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

In addition, the Enseco laboratories maintain a comprehensive set of certifications from both state and federal governmental agencies which require frequent analyses of blind audit samples. Enseco - Rocky Mountain Analytical Laboratory is certified by the EPA under the EPA/CLP program for both Organic and Inorganic analyses, under the USATHAMA (U.S. Army) program, by the Army Corps of Engineers, and the states of Colorado, New Jersey, New York, Utah, and Florida, among others.

The standard laboratory QC package is designed to:

- 1) establish a strong, cost-effective QC program that ensures the generation of scientifically valid, legally defensible data
- 2) assess the laboratory's performance of the analytical method using control limits generated with a well-defined matrix
- 3) establish clear-cut guidelines for acceptability of analytical data so that QC decisions can be made immediately at the bench, and
- 4) provide a standard set of reportables which assures the client of the quality of his data.

The Enseco QC program is based upon monitoring the precision and accuracy of an analytical method by analyzing a set of Duplicate Control Samples (DCS) at frequent, well-defined intervals. Each DCS is a well-characterized matrix which is spiked with target compounds at 5-100 times the reporting limit, depending upon the methodology being monitored. The purpose of the DCS is not to duplicate the sample matrix, but rather to provide an interference-free, homogeneous matrix from which to gather data to establish control limits. These limits are used to determine whether data generated by the laboratory on any given day is in control.

Control limits for accuracy (percent recovery) are based on the average, historical percent recovery +/- 3 standard deviation units. Control limits for precision (relative percent difference) range from 0 (identical duplicate DCS results) to the average, historical relative percent difference + 3 standard deviation units. These control limits are fairly narrow based on the consistency of the matrix being monitored and are updated on a quarterly basis.

For each batch of samples analyzed, an additional control measure is taken in the form of a Single Control Sample (SCS). The SCS consists of a control matrix that is spiked with either representative target compounds or surrogate compounds appropriate to the method being used. An SCS is prepared for each sample lot for which the DCS pair are not analyzed.

Accuracy for DCS and SCS is measured by Percent Recovery.

$$\% \text{ Recovery} = \frac{\text{Measured Concentration}}{\text{Actual Concentration}} \times 100$$

Precision for DCS is measured by Relative Percent Difference (RPD).

$$\text{RPD} = \frac{|\text{Measured Concentration DCS1} - \text{Measured Concentration DCS2}|}{(\text{Measured Concentration DCS1} + \text{Measured Concentration DCS2})/2} \times 100$$

All samples analyzed concurrently by the same test are assigned the same QC lot number. Projects which contain numerous samples, analyzed over several days, may have multiple QC lot numbers associated with each test. The QC information which follows includes a listing of the QC lot numbers associated with each of the samples reported, DCS and SCS (where applicable) recoveries from the QC lots associated with the samples, and control limits for these lots. The QC data is reported by test code, in the order that the tests are reported in the analytical results section of this report.

QC LOT ASSIGNMENT REPORT  
Volatile Organics by GC/MS

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
012743-0001-SA	AQUEOUS	624-A	09 DEC 90-D	13 DEC 90-D
012743-0002-SA	AQUEOUS	624-A	09 DEC 90-D	13 DEC 90-D

DUPLICATE CONTROL SAMPLE REPORT  
Volatile Organics by GC/MS

Analyte	Concentration Spiked	Concentration Measured		AVG	Accuracy Average(%)		Precision (RPD)		
		DCS1	DCS2		DCS	Limits	DCS Limit		
Category: 624-A									
Matrix: AQUEOUS									
QC Lot: 09 DEC 90-D									
Concentration Units: ug/L									
1,1-Dichloroethene	50	46.2	47.7	47.0	94	61-145	3.2	14	
Trichloroethene	50	44.2	45.9	45.0	90	71-120	3.8	14	
Benzene	50	51.0	51.5	51.2	103	76-127	1.0	11	
Toluene	50	47.9	46.6	47.2	95	76-125	2.8	13	
Chlorobenzene	50	44.7	43.9	44.3	89	75-130	1.8	13	

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

SINGLE CONTROL SAMPLE REPORT  
Volatile Organics by GC/MS

Analyte	Concentration		Accuracy(%)	
	Spiked	Measured	SCS	Limits
Category: 624-A				
Matrix: AQUEOUS				
QC Lot: 09 DEC 90-D		QC Run: 13 DEC 90-D		
Concentration Units: ug/L				
1,2-Dichloroethane-d4	50.0	52.2	104	76-114
4-Bromofluorobenzene	50.0	50.4	101	86-115
Toluene-d8	50.0	52.4	105	88-110

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

METHOD BLANK REPORT  
Volatile Organics by GC/MS

Analyte	Result	Units	Reporting Limit
Test: 8240CP-AP9-AP			
Matrix: AQUEOUS			
QC Lot: 09 DEC 90-D	QC Run: 13 DEC 90-D		
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro- propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro- 2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

METHOD BLANK REPORT  
Volatile Organics by GC/MS (cont.)

Analyte	Result	Units	Reporting Limit
Test: 8240CP-AP9-AP			
Matrix: AQUEOUS			
QC Lot: 09 DEC 90-D    QC Run: 13 DEC 90-D			
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0



QC LOT ASSIGNMENT REPORT  
Semivolatile Organics by GC/MS

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
012743-0001-SA	AQUEOUS	625-A	09 DEC 90-B	10 DEC 90-A
012743-0001-SA	AQUEOUS	8280-AP9-A	10 DEC 90-A	-
012743-0001-MB	AQUEOUS	8280-AP9-A	10 DEC 90-A	-
012743-0002-SA	AQUEOUS	625-A	09 DEC 90-B	10 DEC 90-A
012743-0002-SA	AQUEOUS	8280-AP9-A	10 DEC 90-A	-

DUPLICATE CONTROL SAMPLE REPORT  
Semivolatiles by GC/MS

Analyte	Concentration		Measured	AVG	Accuracy		Precision	
	Spiked	DCS1			DCS2	DCS	Average(%) Limits	(RPD)
Category: 625-A								
Matrix: AQUEOUS								
QC Lot: 09 DEC 90-B								
Concentration Units: ug/L								
Phenol	160	108	109	108	68	12- 89	0.9	42
2-Chlorophenol	160	112	115	114	71	27-123	2.6	40
1,4-Dichlorobenzene	80.0	51.8	52.9	52.4	65	36- 97	2.1	28
N-Nitroso-di- n-propylamine	80.0	62.2	74.0	68.1	85	41-116	17	38
1,2,4-Trichlorobenzene	80.0	54.3	56.3	55.3	69	39- 98	3.6	28
4-Chloro-3-methylphenol	160	110	127	118	74	23- 97	14	42
Acenaphthene	80.0	52.2	59.6	55.9	70	46-118	13	31
4-Nitrophenol	160	123	140	132	82	10- 80	13	50
2,4-Dinitrotoluene	80.0	52.5	63.8	58.2	73	24- 96	19	38
Pentachlorophenol	160	85.4	101	93.2	58	9-103	17	50
Pyrene	80.0	44.3	52.7	48.5	61	26-127	17	31

Category: 8280-AP9-A  
Matrix: AQUEOUS  
QC Lot: 10 DEC 90-A  
Concentration Units: ng/L

2,3,7,8-TCDF	10.0	9.45	10.3	9.88	99	60-140	8.6	20
1,2,3,7,8-PeCDF	10.0	8.88	10.3	9.59	96	60-140	15	20
1,2,3,4,7,8-HeCDF	10.0	8.75	10.2	9.48	95	60-140	15	20
1,2,3,4,6,7,8-HpCDF	10.0	ND	ND	NC	NC	60-140	NC	20
OCDF	20.0	ND	ND	NC	NC	60-140	NC	20
2,3,7,8-TCDD	10.0	9.69	10.3	10.0	100	60-140	6.1	20
1,2,3,7,8-PeCDD	10.0	9.37	10.5	9.94	99	60-140	11	20
1,2,3,4,7,8-HeCDD	10.0	9.84	11.9	10.9	109	60-140	19	20
1,2,3,4,6,7,8-HpCDD	10.0	ND	ND	NC	NC	60-140	NC	20
OCDD	20.0	ND	ND	NC	NC	60-140	NC	20

ND = Not detected  
NC = Not calculated, calculation not applicable  
NA = Not applicable

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

SINGLE CONTROL SAMPLE REPORT  
Semivolatile Organics by GC/MS

Analyte	Concentration		Accuracy(%)	
	Spiked	Measured	SCS	Limits
Category: 625-A				
Matrix: AQUEOUS				
QC Lot: 09 DEC 90-B    QC Run: 10 DEC 90-A				
Concentration Units: ug/L				
Nitrobenzene-d5	100	65.9	66	35-114
2-Fluorobiphenyl	100	76.0	76	43-116
Terphenyl-d14	100	89.6	90	33-141
2-Fluorophenol	200	179	90	21-100
Phenol-d5	200	166	83	10- 94
2,4,6-Tribromophenol	200	156	78	10-123

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

METHOD BLANK REPORT  
Semivolatile Organics by GC/MS

Analyte	Result	Units	Reporting Limit
Test: 8270CP-AP9-A			
Matrix: AQUEOUS			
QC Lot: 09 DEC 90-B    QC Run: 10 DEC 90-A			
Acenaphthene	ND	ug/L	10
Acenaphthylene	ND	ug/L	10
Acetophenone	ND	ug/L	10
2-Acetylaminofluorene	ND	ug/L	100
4-Aminobiphenyl	ND	ug/L	10
Aniline	ND	ug/L	10
Anthracene	ND	ug/L	10
Aramite	ND	ug/L	10
Benzo(a)anthracene	ND	ug/L	10
Benzo(b)fluoranthene	ND	ug/L	10
Benzo(k)fluoranthene	ND	ug/L	10
Benzo(g,h,i)perylene	ND	ug/L	10
Benzo(a)pyrene	ND	ug/L	10
Benzyl alcohol	ND	ug/L	10
4-Bromophenyl phenyl ether	ND	ug/L	10
Butyl benzyl phthalate	ND	ug/L	10
2-sec-Butyl-4,6-dinitro- phenol	ND	ug/L	10
4-Chloroaniline	ND	ug/L	10
bis(2-Chloroethoxy)- methane	ND	ug/L	10
bis(2-Chloroethyl) ether	ND	ug/L	10
bis(2-Chloroisopropyl)- ether	ND	ug/L	10
4-Chloro-3-methylphenol	ND	ug/L	10
2-Chloronaphthalene	ND	ug/L	10
2-Chlorophenol	ND	ug/L	10
4-Chlorophenyl phenyl ether	ND	ug/L	10
Chrysene	ND	ug/L	10
Dibenz(a,h)anthracene	ND	ug/L	10
Dibenzofuran	ND	ug/L	10
Di-n-butyl phthalate	ND	ug/L	10
1,2-Dichlorobenzene	ND	ug/L	10
1,3-Dichlorobenzene	ND	ug/L	10
1,4-Dichlorobenzene	ND	ug/L	10
3,3'-Dichlorobenzidine	ND	ug/L	20
2,4-Dichlorophenol	ND	ug/L	10
2,6-Dichlorophenol	ND	ug/L	10
Diethyl phthalate	ND	ug/L	10

METHOD BLANK REPORT  
Semivolatile Organics by GC/MS (cont.)

Analyte	Result	Units	Reporting Limit
Test: 8270CP-AP9-A			
Matrix: AQUEOUS			
QC Lot: 09 DEC 90-B QC Run: 10 DEC 90-A			
Dimethoate	ND	ug/L	--
p-Dimethylaminoazobenzene	ND	ug/L	10
7,12-Dimethylbenz(a)-anthracene	ND	ug/L	10
3,3'-Dimethylbenzidine	ND	ug/L	10
a,a-Dimethylphenethylamine	ND	ug/L	10
2,4-Dimethylphenol	ND	ug/L	10
Dimethyl phthalate	ND	ug/L	10
1,3-Dinitrobenzene	ND	ug/L	10
4,6-Dinitro-2-methylphenol	ND	ug/L	50
2,4-Dinitrophenol	ND	ug/L	50
2,4-Dinitrotoluene	ND	ug/L	10
2,6-Dinitrotoluene	ND	ug/L	10
Di-n-octyl phthalate	ND	ug/L	10
Diphenylamine	ND	ug/L	10
Disulfoton	ND	ug/L	50
bis(2-Ethylhexyl) phthalate	ND	ug/L	10
Ethyl methanesulfonate	ND	ug/L	10
Famphur	ND	ug/L	--
Fluoranthene	ND	ug/L	10
Fluorene	ND	ug/L	10
Hexachlorobenzene	ND	ug/L	10
Hexachlorobutadiene	ND	ug/L	10
Hexachlorocyclopentadiene	ND	ug/L	10
Hexachloroethane	ND	ug/L	10
Hexachlorophene	ND	ug/L	--
Hexachloropropene	ND	ug/L	10
Indeno(1,2,3-cd)pyrene	ND	ug/L	10
Isophorone	ND	ug/L	10
Isosafrole	ND	ug/L	20
Methapyrilene	ND	ug/L	10
3-Methylcholanthrene	ND	ug/L	10
Methyl methanesulfonate	ND	ug/L	10
2-Methylnaphthalene	ND	ug/L	10
Methyl parathion	ND	ug/L	50
2-Methylphenol	ND	ug/L	10
3/4-Methylphenol	ND	ug/L	10
Naphthalene	ND	ug/L	10

METHOD BLANK REPORT  
Semivolatile Organics by GC/MS (cont.)

Analyte	Result	Units	Reporting Limit
Test: 8270CP-AP9-A			
Matrix: AQUEOUS			
QC Lot: 09 DEC 90-B	QC Run: 10 DEC 90-A		
1,4-Naphthoquinone	ND	ug/L	10
1-Naphthylamine	ND	ug/L	10
2-Naphthylamine	ND	ug/L	10
2-Nitroaniline	ND	ug/L	50
3-Nitroaniline	ND	ug/L	50
4-Nitroaniline	ND	ug/L	50
Nitrobenzene	ND	ug/L	10
2-Nitrophenol	ND	ug/L	10
4-Nitrophenol	ND	ug/L	50
4-Nitroquinoline-1-oxide	ND	ug/L	--
N-Nitroso-di-n-butylamine	ND	ug/L	10
N-Nitrosodiethylamine	ND	ug/L	10
N-Nitrosodimethylamine	ND	ug/L	10
N-Nitrosodiphenylamine	ND	ug/L	10
N-Nitroso-di-n-propylamine	ND	ug/L	10
N-Nitrosomethylethylamine	ND	ug/L	10
N-Nitrosomorpholine	ND	ug/L	10
N-Nitrosopiperidine	ND	ug/L	10
N-Nitrosopyrrolidine	ND	ug/L	10
5-Nitro-o-toluidine	ND	ug/L	10
Parathion	ND	ug/L	50
Pentachlorobenzene	ND	ug/L	10
Pentachloroethane	ND	ug/L	10
Pentachloronitrobenzene	ND	ug/L	50
Pentachlorophenol	ND	ug/L	50
Phenacetin	ND	ug/L	10
Phenanthrene	ND	ug/L	10
Phenol	ND	ug/L	10
4-Phenylenediamine	ND	ug/L	--
Phorate	ND	ug/L	100
2-Picoline	ND	ug/L	10
Pronamide	ND	ug/L	10
Pyrene	ND	ug/L	10
Pyridine	ND	ug/L	20
Safrole	ND	ug/L	10
Sulfotepp	ND	ug/L	50
1,2,4,5-Tetrachlorobenzene	ND	ug/L	10
2,3,4,6-Tetrachlorophenol	ND	ug/L	50
Thionazin	ND	ug/L	50

METHOD BLANK REPORT  
Semivolatile Organics by GC/MS (cont.)

Analyte	Result	Units	Reporting Limit
Test: 8270CP-AP9-A			
Matrix: AQUEOUS			
QC Lot: 09 DEC 90-B    QC Run: 10 DEC 90-A			
2-Toluidine	ND	ug/L	10
1,2,4-Trichlorobenzene	ND	ug/L	10
2,4,5-Trichlorophenol	ND	ug/L	50
2,4,6-Trichlorophenol	ND	ug/L	10
0,0,0-Triethylphosphorothioate	ND	ug/L	10
1,3,5-Trinitrobenzene	ND	ug/L	10

Appendix IX Dioxins/Furans

Low Resolution

Client Name: U.S. Geological Survey  
 Client ID: Dioxin Method Blank  
 Lab ID: 012743-0001-MB  
 Matrix: AQUEOUS  
 Authorized: 07 DEC 90  
 Sampled: NA  
 Prepared: 10 DEC 90  
 Received: NA  
 Analyzed: 02 JAN 91

Sample Amount 500 MLS  
 Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
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Furans

TCDFs (total)	ND	ng/L	0.12	
PeCDFs (total)	ND	ng/L	0.16	
HxCDFs (total)	ND	ng/L	0.28	

Dioxins

TCDDs (total)	ND	ng/L	0.20	
2,3,7,8-TCDD	ND	ng/L	0.20	
PeCDDs (total)	ND	ng/L	0.34	
HxCDDs (total)	ND	ng/L	0.52	

% Recovery

13C-2,3,7,8-TCDF	94
13C-2,3,7,8-TCDD	96
13C-1,2,3,7,8-PeCDD	101
13C-1,2,3,6,7,8-HxCDD	105

ND = Not detected  
 NA = Not applicable

Reported By: Bob Martin

Approved By: Jeff Lowry



QC LOT ASSIGNMENT REPORT  
Volatile Organics by GC

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
012743-0001-SA	AQUEOUS	601-A	10 DEC 90-F	10 DEC 90-F
012743-0001-SA	AQUEOUS	601-A	10 DEC 90-F	10 DEC 90-F2
012743-0002-SA	AQUEOUS	601-A	10 DEC 90-F	10 DEC 90-F
012743-0002-SA	AQUEOUS	601-A	10 DEC 90-F	10 DEC 90-F2

DUPLICATE CONTROL SAMPLE REPORT  
Volatile Organics by GC

Analyte	Concentration		Measured	AVG	Accuracy		Precision	
	Spiked	DCS1			DCS2	Average (%)	Limits	(RPD)
Category: 601-A								
Matrix: AQUEOUS								
QC Lot: 10 DEC 90-F								
Concentration Units: ug/L								
1,1-Dichloroethane	5.0	4.34	4.57	4.46	89	80-130	5.2	20
Chloroform	5.0	4.47	4.73	4.60	92	80-120	5.7	20
Bromodichloromethane	10	9.10	9.46	9.28	93	80-120	3.9	20
Trichloroethene	5.0	4.83	5.26	5.04	101	70-120	8.5	20
Chlorobenzene	5.0	3.89	4.15	4.02	80	80-120	6.5	20

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

SINGLE CONTROL SAMPLE REPORT  
Volatile Organics by GC

Analyte	Concentration		Accuracy(%)	
	Spiked	Measured	SCS	Limits

Category: 601-A  
Matrix: AQUEOUS  
QC Lot: 10 DEC 90-F    QC Run: 10 DEC 90-F  
Concentration Units: ug/L

Bromochloromethane	5.00	4.43	89	20-160
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Category: 601-A  
Matrix: AQUEOUS  
QC Lot: 10 DEC 90-F    QC Run: 10 DEC 90-F2  
Concentration Units: ug/L

Bromochloromethane	5.00	4.73	95	20-160
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Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT  
Volatile Organics by GC

Analyte	Result	Units	Reporting Limit
Test: 601-AFIR-A			
Matrix: AQUEOUS			
QC Lot: 10 DEC 90-F    QC Run: 10 DEC 90-F			
Chloromethane	ND	ug/L	1.1
Bromomethane	ND	ug/L	6.0
Dichlorodifluoromethane	ND	ug/L	9.0
Vinyl chloride	ND	ug/L	0.60
Chloroethane	ND	ug/L	3.0
Methylene chloride	ND	ug/L	2.0
Trichlorofluoromethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.70
1,1-Dichloroethane	ND	ug/L	0.40
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.30
1,2-Dichloroethane	ND	ug/L	0.50
1,1,1-Trichloroethane	ND	ug/L	0.20
Carbon tetrachloride	ND	ug/L	0.60
Bromodichloromethane	ND	ug/L	0.50
1,2-Dichloropropane	ND	ug/L	0.50
trans-1,3-Dichloropropene	ND	ug/L	2.0
Trichloroethene	ND	ug/L	0.60
Dibromochloromethane	ND	ug/L	0.60
1,1,2-Trichloroethane	ND	ug/L	0.20
2-Chloroethyl vinyl ether	ND	ug/L	5.5
Bromoform	ND	ug/L	1.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.4
Tetrachloroethene	ND	ug/L	0.40
Chlorobenzene	ND	ug/L	1.2
1,3-Dichlorobenzene	ND	ug/L	1.0
1,2-Dichlorobenzene	ND	ug/L	0.50
1,4-Dichlorobenzene	ND	ug/L	0.50
Benzyl chloride	ND	ug/L	6.8
Bromobenzene	ND	ug/L	5.0
bis(2-Chloroisopropyl)- ether	ND	ug/L	10
1-Chlorohexane	ND	ug/L	5.0
4-Chlorotoluene	ND	ug/L	23
Dibromomethane	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0

METHOD BLANK REPORT  
Volatile Organics by GC (cont.)

Analyte	Result	Units	Reporting Limit
Test: 601-AFIR-2-A			
Matrix: AQUEOUS			
QC Lot: 10 DEC 90-F QC Run: 10 DEC 90-F2			
Chloromethane	ND	ug/L	1.1
Bromomethane	ND	ug/L	6.0
Dichlorodifluoromethane	ND	ug/L	9.0
Vinyl chloride	ND	ug/L	0.60
Chloroethane	ND	ug/L	3.0
Methylene chloride	ND	ug/L	2.0
Trichlorofluoromethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.70
1,1-Dichloroethane	ND	ug/L	0.40
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.30
1,2-Dichloroethane	ND	ug/L	0.50
1,1,1-Trichloroethane	ND	ug/L	0.20
Carbon tetrachloride	ND	ug/L	0.60
Bromodichloromethane	ND	ug/L	0.50
1,2-Dichloropropane	ND	ug/L	0.50
trans-1,3-Dichloropropene	ND	ug/L	2.0
Trichloroethene	ND	ug/L	0.60
Dibromochloromethane	ND	ug/L	0.60
1,1,2-Trichloroethane	ND	ug/L	0.20
2-Chloroethyl vinyl ether	ND	ug/L	5.5
Bromoform	ND	ug/L	1.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.4
Tetrachloroethene	ND	ug/L	0.40
Chlorobenzene	ND	ug/L	1.2
1,3-Dichlorobenzene	ND	ug/L	1.0
1,2-Dichlorobenzene	ND	ug/L	0.50
1,4-Dichlorobenzene	ND	ug/L	0.50
Benzyl chloride	ND	ug/L	6.8
Bromobenzene	ND	ug/L	5.0
bis(2-Chloroisopropyl)- ether	ND	ug/L	10
1-Chlorohexane	ND	ug/L	5.0
4-Chlorotoluene	ND	ug/L	23
Dibromomethane	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0

QC LOT ASSIGNMENT REPORT  
Semivolatile Organics by GC

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
012743-0001-SA	AQUEOUS	608-A	11 DEC 90-A	11 DEC 90-A
012743-0001-SA	AQUEOUS	615-A	11 DEC 90-A	11 DEC 90-A
012743-0002-SA	AQUEOUS	608-A	11 DEC 90-A	11 DEC 90-A
012743-0002-SA	AQUEOUS	615-A	11 DEC 90-A	11 DEC 90-A

DUPLICATE CONTROL SAMPLE REPORT  
Semivolatile Organics by GC

Analyte	Concentration		Measured	AVG	Accuracy		Precision	
	Spiked	DCS1			DCS2	Average (%)	Limits	(RPD)
Category: 608-A								
Matrix: AQUEOUS								
QC Lot: 11 DEC 90-A								
Concentration Units: ug/L								
gamma-BHC (Lindane)	0.200	0.155	0.199	0.177	89	56-123	25	15
Heptachlor	0.200	0.168	0.208	0.188	94	40-131	21	20
Aldrin	0.200	0.152	0.185	0.168	84	40-120	20	22
Dieldrin	0.500	0.398	0.514	0.456	91	52-126	25	18
Endrin	0.500	0.399	0.517	0.458	92	56-121	26	21
4,4'-DDT	0.500	0.400	0.499	0.450	90	38-127	22	27

Category: 615-A  
Matrix: AQUEOUS  
QC Lot: 11 DEC 90-A  
Concentration Units: ug/L

2,4-D	5.0	2.89	3.19	3.04	61	19-129	9.9	54
2,4,5-TP (Silvex)	1.0	0.647	0.732	0.690	69	23-127	12	39
2,4,5-T	1.0	0.604	0.684	0.644	64	40-112	12	20

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

SINGLE CONTROL SAMPLE REPORT  
Semivolatile Organics by GC

Analyte	Concentration		Accuracy(%)	
	Spiked	Measured	SCS	Limits
Category: 608-A Matrix: AQUEOUS QC Lot: 11 DEC 90-A    QC Run: 11 DEC 90-A Concentration Units: ug/L				
Dibutyl chlorendate	1.00	0.663	66	48-136
Category: 615-A Matrix: AQUEOUS QC Lot: 11 DEC 90-A    QC Run: 11 DEC 90-A Concentration Units: ug/L				
DCAA	5.00	4.76	95	60-120

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



METHOD BLANK REPORT  
Semivolatile Organics by GC

Analyte	Result	Units	Reporting Limit
Test: 8080CP-AP9-A			
Matrix: AQUEOUS			
QC Lot: 11 DEC 90-A    QC Run: 11 DEC 90-A			
Aldrin	ND	ug/L	0.050
Aroclor 1016	ND	ug/L	1.0
Aroclor 1221	ND	ug/L	1.0
Aroclor 1232	ND	ug/L	1.0
Aroclor 1242	ND	ug/L	1.0
Aroclor 1248	ND	ug/L	1.0
Aroclor 1254	ND	ug/L	1.0
Aroclor 1260	ND	ug/L	1.0
alpha-BHC	ND	ug/L	0.050
beta-BHC	ND	ug/L	0.050
delta-BHC	ND	ug/L	0.050
gamma-BHC (Lindane)	ND	ug/L	0.050
alpha-Chlordane	ND	ug/L	0.050
gamma-Chlordane	ND	ug/L	0.050
Chlorobenzilate	ND	ug/L	0.10
4,4'-DDD	ND	ug/L	0.10
4,4'-DDE	ND	ug/L	0.10
4,4'-DDT	ND	ug/L	0.10
Diallate	ND	ug/L	1.0
Dieldrin	ND	ug/L	0.10
Endosulfan I	ND	ug/L	0.050
Endosulfan II	ND	ug/L	0.10
Endosulfan sulfate	ND	ug/L	0.10
Endrin	ND	ug/L	0.10
Endrin aldehyde	ND	ug/L	0.10
Heptachlor	ND	ug/L	0.050
Heptachlor epoxide	ND	ug/L	0.050
Isodrin	ND	ug/L	0.10
Kepone	ND	ug/L	1.0
Methoxychlor	ND	ug/L	0.50
Toxaphene	ND	ug/L	5.0

Test: 615-AP9-A  
Matrix: AQUEOUS  
QC Lot: 11 DEC 90-A    QC Run: 11 DEC 90-A

2,4-D	ND	ug/L	1.2
2,4,5-T	ND	ug/L	0.20
2,4,5-TP (Silvex)	ND	ug/L	0.17

QC LOT ASSIGNMENT REPORT  
Metals Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
012743-0001-SA	AQUEOUS	CR-FAA-AD	21 JAN 91-A	-
012743-0001-SA	AQUEOUS	CR-FAA-AT	21 JAN 91-A	21 JAN 91-A
012743-0001-SA	AQUEOUS	ICP-AT	24 JAN 91-A	24 JAN 91-A
012743-0001-SA	AQUEOUS	AS-FAA-AT	21 JAN 91-A	21 JAN 91-A
012743-0001-SA	AQUEOUS	TL-FAA-AT	21 JAN 91-A	21 JAN 91-A
012743-0001-SA	AQUEOUS	SE-FAA-AT	21 JAN 91-A	21 JAN 91-A
012743-0001-SA	AQUEOUS	PB-FAA-AT	21 JAN 91-A	21 JAN 91-A
012743-0001-SA	AQUEOUS	ICP-AD	22 JAN 91-K	-
012743-0001-SA	AQUEOUS	AS-FAA-AD	21 JAN 91-A	-
012743-0001-SA	AQUEOUS	TL-FAA-AD	21 JAN 91-A	-
012743-0001-SA	AQUEOUS	SE-FAA-AD	21 JAN 91-A	-
012743-0001-SA	AQUEOUS	PB-FAA-AD	21 JAN 91-C	-
012743-0001-SA	AQUEOUS	HG-CVAA-AT	28 DEC 90-A	28 DEC 90-A
012743-0001-SA	AQUEOUS	HG-CVAA-AT	02 JAN 91-A	02 JAN 91-A
012743-0002-SA	AQUEOUS	CR-FAA-AD	21 JAN 91-A	-
012743-0002-SA	AQUEOUS	CR-FAA-AT	21 JAN 91-A	21 JAN 91-A
012743-0002-SA	AQUEOUS	ICP-AT	24 JAN 91-A	24 JAN 91-A
012743-0002-SA	AQUEOUS	AS-FAA-AT	21 JAN 91-A	21 JAN 91-A
012743-0002-SA	AQUEOUS	TL-FAA-AT	21 JAN 91-A	21 JAN 91-A
012743-0002-SA	AQUEOUS	SE-FAA-AT	21 JAN 91-A	21 JAN 91-A
012743-0002-SA	AQUEOUS	PB-FAA-AT	21 JAN 91-A	21 JAN 91-A
012743-0002-SA	AQUEOUS	ICP-AD	22 JAN 91-K	-
012743-0002-SA	AQUEOUS	AS-FAA-AD	21 JAN 91-A	-
012743-0002-SA	AQUEOUS	TL-FAA-AD	21 JAN 91-A	-
012743-0002-SA	AQUEOUS	SE-FAA-AD	21 JAN 91-A	-
012743-0002-SA	AQUEOUS	PB-FAA-AD	21 JAN 91-C	-
012743-0002-SA	AQUEOUS	HG-CVAA-AT	28 DEC 90-A	28 DEC 90-A
012743-0002-SA	AQUEOUS	HG-CVAA-AT	02 JAN 91-A	02 JAN 91-A

DUPLICATE CONTROL SAMPLE REPORT  
Metals Analysis and Preparation

Analyte	Concentration Spiked	Concentration Measured		AVG	Accuracy Average(%)		Precision (RPD)		
		DCS1	DCS2		DCS	Limits	DCS	Limit	
Category: CR-FAA-AD Matrix: AQUEOUS QC Lot: 21 JAN 91-A Concentration Units: mg/L									
Chromium	0.02	0.0202	0.0202	0.0202	101	75-125	0.0	20	
Category: CR-FAA-AT Matrix: AQUEOUS QC Lot: 21 JAN 91-A Concentration Units: mg/L									
Chromium	0.20	0.203	0.214	0.208	104	75-125	5.3	20	
Category: ICP-AT Matrix: AQUEOUS QC Lot: 24 JAN 91-A Concentration Units: mg/L									
Aluminum	2.0	1.95	1.92	1.93	97	75-125	1.2	20	
Antimony	0.5	0.443	0.444	0.444	89	75-125	0.1	20	
Arsenic	0.5	0.442	0.462	0.452	90	75-125	4.5	20	
Barium	2.0	1.86	1.85	1.85	93	75-125	0.4	20	
Beryllium	0.05	0.0493	0.0473	0.0483	97	75-125	4.1	20	
Cadmium	0.05	0.0437	0.0403	0.0420	84	75-125	8.2	20	
Calcium	100	97.1	97.8	97.5	97	75-125	0.6	20	
Chromium	0.2	0.193	0.195	0.194	97	75-125	1.3	20	
Cobalt	0.5	0.471	0.467	0.469	94	75-125	0.8	20	
Copper	0.25	0.253	0.246	0.250	100	75-125	2.6	20	
Iron	1.0	0.984	0.971	0.978	98	75-125	1.3	20	
Lead	0.5	0.446	0.459	0.452	90	75-125	2.7	20	
Magnesium	50	49.4	49.5	49.5	99	75-125	0.2	20	
Manganese	0.5	0.475	0.475	0.475	95	75-125	0.2	20	
Nickel	0.5	0.475	0.478	0.476	95	75-125	0.6	20	
Potassium	50	49.7	49.3	49.5	99	75-125	0.8	20	
Silver	0.05	0.0446	0.0472	0.0459	92	75-125	5.8	20	
Sodium	100	101	100	101	101	75-125	1.4	20	
Vanadium	0.5	0.486	0.480	0.483	97	75-125	1.3	20	
Zinc	0.5	0.455	0.458	0.456	91	75-125	0.6	20	

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

DUPLICATE CONTROL SAMPLE REPORT  
Metals Analysis and Preparation (cont.)

Analyte	Spiked	Concentration		AVG	Accuracy		Precision		
		DCS1	Measured DCS2		Average(%) DCS	Limits	(RPD) DCS	Limit	
Category: AS-FAA-AT Matrix: AQUEOUS QC Lot: 21 JAN 91-A Concentration Units: mg/L									
Arsenic	0.04	0.0400	0.0380	0.0390	98	75-125	5.1	20	
Category: TL-FAA-AT Matrix: AQUEOUS QC Lot: 21 JAN 91-A Concentration Units: mg/L									
Thallium	0.05	0.0477	0.0459	0.0468	94	75-125	3.8	20	
Category: SE-FAA-AT Matrix: AQUEOUS QC Lot: 21 JAN 91-A Concentration Units: mg/L									
Selenium	0.01	0.0111	0.00980	0.0104	105	75-125	12	20	
Category: PB-FAA-AT Matrix: AQUEOUS QC Lot: 21 JAN 91-A Concentration Units: mg/L									
Lead	0.02	0.0208	0.0196	0.0202	101	75-125	5.9	20	
Category: ICP-AD Matrix: AQUEOUS QC Lot: 22 JAN 91-K Concentration Units: mg/L									
Aluminum	2.0	1.94	1.96	1.95	98	75-125	1.2	20	
Antimony	0.5	0.453	0.469	0.461	92	75-125	3.5	20	
Arsenic	0.5	0.444	0.452	0.448	90	75-125	1.6	20	
Barium	2.0	1.84	1.87	1.85	93	75-125	2.0	20	
Beryllium	0.05	0.0510	0.0491	0.0500	100	75-125	3.8	20	
Cadmium	0.05	0.0380	0.0400	0.0390	78	75-125	5.0	20	
Calcium	100	96.1	98.0	97.1	97	75-125	2.0	20	
Chromium	0.2	0.190	0.188	0.189	95	75-125	0.7	20	

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

DUPLICATE CONTROL SAMPLE REPORT  
Metals Analysis and Preparation (cont.)

Analyte	Spiked	Concentration		AVG	Accuracy		Precision		
		DCS1	Measured DCS2		Average(%) DCS	Limits	(RPD) DCS	Limit	
Category: ICP-AD									
Matrix: AQUEOUS									
QC Lot: 22 JAN 91-K									
Concentration Units: mg/L									
Cobalt	0.5	0.459	0.467	0.463	93	75-125	1.7	20	
Copper	0.25	0.249	0.251	0.250	100	75-125	1.1	20	
Iron	1.0	0.988	0.994	0.991	99	75-125	0.5	20	
Lead	0.5	0.454	0.446	0.450	90	75-125	1.7	20	
Magnesium	50	48.3	48.9	48.6	97	75-125	1.1	20	
Manganese	0.5	0.468	0.474	0.471	94	75-125	1.3	20	
Nickel	0.5	0.468	0.471	0.469	94	75-125	0.6	20	
Potassium	50	45.1	46.8	46.0	92	75-125	3.6	20	
Silver	0.05	0.0472	0.0501	0.0486	97	75-125	6.0	20	
Sodium	100	94.6	96.4	95.5	96	75-125	1.9	20	
Vanadium	0.5	0.484	0.487	0.486	97	75-125	0.5	20	
Zinc	0.5	0.450	0.461	0.456	91	75-125	2.4	20	

Category: AS-FAA-AD  
Matrix: AQUEOUS  
QC Lot: 21 JAN 91-A  
Concentration Units: mg/L

Arsenic	0.04	0.0300	0.0303	0.0302	75	75-125	1.0	20
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Category: TL-FAA-AD  
Matrix: AQUEOUS  
QC Lot: 21 JAN 91-A  
Concentration Units: mg/L

Thallium	0.05	0.0488	0.0494	0.0491	98	75-125	1.2	20
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Category: SE-FAA-AD  
Matrix: AQUEOUS  
QC Lot: 21 JAN 91-A  
Concentration Units: mg/L

Selenium	0.01	0.00890	0.00920	0.00905	91	75-125	3.3	20
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Calculations are performed before rounding to avoid round-off errors in calculated results.

DUPLICATE CONTROL SAMPLE REPORT  
Metals Analysis and Preparation (cont.)

Analyte	Spiked	Concentration		AVG	Accuracy Average (%)		Precision (RPD)		
		DCS1	DCS2		DCS	Limits	DCS	Limit	
Category: PB-FAA-AD Matrix: AQUEOUS QC Lot: 21 JAN 91-C Concentration Units: mg/L									
Lead	0.02	0.0168	0.0171	0.0170	85	75-125	1.8	20	
Category: HG-CVAA-AT Matrix: AQUEOUS QC Lot: 28 DEC 90-A Concentration Units: mg/L									
Mercury	0.0010	0.00102	0.00100	0.00101	101	75-125	2.0	20	
Category: HG-CVAA-AT Matrix: AQUEOUS QC Lot: 02 JAN 91-A Concentration Units: mg/L									
Mercury	0.0010	0.00102	0.00103	0.00102	103	75-125	1.0	20	

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

**METHOD BLANK REPORT**  
**Metals Analysis and Preparation**

Analyte	Result	Units	Reporting Limit
Test: CR-FAA-AT Matrix: AQUEOUS QC Lot: 21 JAN 91-A    QC Run: 21 JAN 91-A			
Chromium	0.0010	mg/L	0.0010
Test: ICP-AP9-AT Matrix: AQUEOUS QC Lot: 24 JAN 91-A    QC Run: 24 JAN 91-A			
Antimony	ND	mg/L	0.060
Barium	ND	mg/L	0.010
Beryllium	ND	mg/L	0.0020
Cadmium	ND	mg/L	0.0050
Chromium	ND	mg/L	0.010
Cobalt	ND	mg/L	0.010
Copper	ND	mg/L	0.020
Nickel	ND	mg/L	0.040
Silver	ND	mg/L	0.010
Tin	ND	mg/L	0.10
Vanadium	ND	mg/L	0.010
Zinc	ND	mg/L	0.020
Test: AS-FAA-AT Matrix: AQUEOUS QC Lot: 21 JAN 91-A    QC Run: 21 JAN 91-A			
Arsenic	ND	mg/L	0.0050
Test: TL-FAA-AT Matrix: AQUEOUS QC Lot: 21 JAN 91-A    QC Run: 21 JAN 91-A			
Thallium	ND	mg/L	0.0050

METHOD BLANK REPORT  
Metals Analysis and Preparation (cont.)

Analyte	Result	Units	Reporting Limit
Test: SE-FAA-AT Matrix: AQUEOUS QC Lot: 21 JAN 91-A    QC Run: 21 JAN 91-A			
Selenium	ND	mg/L	0.0050
Test: PB-FAA-AT Matrix: AQUEOUS QC Lot: 21 JAN 91-A    QC Run: 21 JAN 91-A			
Lead	ND	mg/L	0.0050
Test: HG-CVAA-AD Matrix: AQUEOUS QC Lot: 28 DEC 90-A    QC Run: 28 DEC 90-A			
Mercury	ND	mg/L	0.00020
Test: HG-CVAA-AT Matrix: AQUEOUS QC Lot: 02 JAN 91-A    QC Run: 02 JAN 91-A			
Mercury	ND	mg/L	0.00020



QC LOT ASSIGNMENT REPORT  
Wet Chemistry Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
012743-0001-SA	AQUEOUS	TOC-A	18 DEC 90-X	-
012743-0001-SA	AQUEOUS	TOX-A	19 DEC 90-M	-
012743-0001-SA	AQUEOUS	CN-A	18 DEC 90-G	18 DEC 90-G
012743-0001-SA	AQUEOUS	S-A	13 DEC 90-A	-
012743-0001-SA	AQUEOUS	NO3-A	19 DEC 90-A	-
012743-0002-SA	AQUEOUS	TOC-A	18 DEC 90-X	-
012743-0002-SA	AQUEOUS	TOX-A	19 DEC 90-M	-
012743-0002-SA	AQUEOUS	CN-A	18 DEC 90-G	18 DEC 90-G
012743-0002-SA	AQUEOUS	S-A	13 DEC 90-A	-
012743-0002-SA	AQUEOUS	NO3-A	19 DEC 90-A	-

DUPLICATE CONTROL SAMPLE REPORT  
Wet Chemistry Analysis and Preparation

Analyte	Spiked	Concentration		AVG	Accuracy		Precision		
		DCS1	Measured DCS2		Average(%) DCS	Limits	(RPD) DCS	Limit	
Category: TOC-A Matrix: AQUEOUS QC Lot: 18 DEC 90-X Concentration Units: mg/L									
Total Organic Carbon	25.0	24.1	24.0	24.0	96	91-109	0.4	20	
Category: TOX-A Matrix: AQUEOUS QC Lot: 19 DEC 90-M Concentration Units: ug Cl/L									
Total Organic Halogen as Cl	100	95.3	98.8	97.0	97	80-120	3.6	20	
Category: CN-A Matrix: AQUEOUS QC Lot: 18 DEC 90-G Concentration Units: mg/L									
Cyanide	0.20	0.182	0.181	0.182	91	75-125	0.6	20	
Category: S-A Matrix: AQUEOUS QC Lot: 13 DEC 90-A Concentration Units: mg/L									
Sulfide, Total	0.434	0.410	0.410	0.410	94	80-120	0.0	20	
Category: NO3-A Matrix: AQUEOUS QC Lot: 19 DEC 90-A Concentration Units: mg/L									
Nitrate as N	5.4	5.36	5.35	5.36	99	91-109	0.2	10	

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

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METHOD BLANK REPORT  
Wet Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: CNTOT-TEC-A			
Matrix: AQUEOUS			
QC Lot: 18 DEC 90-G	QC Run: 18 DEC 90-G		
Cyanide	ND	mg/L	0.010

# Appendix

Special Handling

(Circle as appropriate and explain in record 5)

RMA #12743

Site Type (circle one)

SW - Surface Water  
**GW** - Ground Water  
ME - Meteorological

LK - Lake  
ES - Estuary  
SP - Spring  
SS - Special Source  
Phone (FTS) (305) 262-5340

Hazardous material

EQUIPMENT BLANK SAMPLE

Field ID

KIRTLAND

KAFB090210-2

USGS/WRD/NEWMEXICO

AFB IRP

R. Wilcox

Station Name

Field Office

Project

Collector

Phone (FTS)

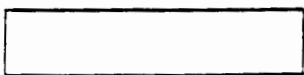
File Deposition\*

(Circle one)

Q - WATSTORE

X - Lab File

Sample identification



KAFB090210-2

463536001

For Laboratory Use Only

Station ID or Unique Number\*

Project Account #

1 9 9 0 12 06 10 15 12 06 11 58 NM 035 001  
Year\* Month\* Day\* Time\* Month\* Day\* Time\* State Code\* District/User Code\* County Code  
Begin Date Composite End Date

Analysis level codes and schedules

6 Geologic Unit H or 9 Analysis Status\*\* 9 Analysis Source\*\* 9 Hydrologic Condition\*\* 9 Sample Type\*\* 9 Hydrologic Event\*\*

PARAMETER:

TOC TOX

DISSOLVED CHROMIUM

TOTAL CHROMIUM

VOX

APPE VDC

METHOD:

SW 9060 SW 9020

SW 3005/SW 7191

SW 3020/SW 7191

SW 5030/SW 8010

SW 5030/SW 8240

PARAMETER:

APPE SEMI VDC

APPE PESTICIDES

APPE HERBICIDES

APPE DIOXINS

APPE

METHOD:

SW 3570/SW 8270

SW 3520/SW 8080

SW 3520/SW 8150

SW 3520/SW 8280

EXTRA SAMPLE

PARAMETER:

APPE ICP, TOTAL

APPE ICP, DISS

APPE

APPE

NITRATE

METHOD:

SW 3005/SW 6010

SW 3005/SW 6010

CYANIDE

SULFIDE

E353.24 & E354.1

Chain-of-Custody Record

PROJECT NAME KIRTLAND AFB IRP PROJECT NO. 463536001 P.O. NO.

Relinquished by: (Signature) Ft. Edlen Royal Received by: (Signature) AIRBORNE EXPRESS Date 12/5/90 Time 1515

Relinquished by: (Signature) Received by: (Signature) Justin Chappell Date 12-7-90 Time 900 AM

Relinquished by: (Signature) Received at lab by: (Signature) Date Time

Relinquished from lab by: (Signature) Received by: (Signature) Date Time

Comments (Only 50 characters stored in NWIS)

Record 5 WELL NR TIJERAS ARROYO DOWN STR, EQUIPMENT BLANK SAMPLE

Record 6

Total number of sample bottles for this request: 19

SHIP TO:

Enseco-Rocky Mountain Analytical  
4955 Yarrow Street  
Arvada, CO 80002  
(303) 421-6611

ATTENTION: LINDSAY BRYER

Special Handling

(Circle as appropriate and explain in record 5)

RMA #12 743

Site Type (circle one)

Hazardous material

SW - Surface Water  
GW - Ground Water  
ME - Meteorological

LK - Lake  
ES - Estuary  
SP - Spring  
SS - Special Source

KAFB 090209-2

Field ID KIRTLAND

USGS/WRD/NEWMEXICO AFB IRP

Collector R. WILCOX

Phone (FTS) (305) 262-5340

File Deposition\*

(Circle one)  
Q - WATSTORE  
X - Lab File

Sample identification

For Laboratory Use Only

KAFB 090209-2

463536001

1990  
Year\*

12  
Month\*

06  
Day\*

1015  
Time\*

12  
Month

06  
Day

1158  
Time

NM  
State Code\*

035  
District/ User Code\*

001  
County Code

Begin Date

Composite End Date

Analysis level codes and schedules

6 Sample Medium\*\*  
Geologic Unit  
H or 9 Analysis Status\*\*  
9 Analysis Source\*\*  
Hydrologic Condition\*\*  
9 Sample Type\*\*  
9 Hydrologic Event\*\*

PARAMETER:	TOC	TDX	DISSOLVED CHROMIUM	TOTAL CHROMIUM	VDX	APPTX VDC
METHOD:	SW9060	SW9020	SW3005/SW7191	SW3020/SW7191	SW5030/SW8010	SW5030/SW8240
PARAMETER:	APPTX SEMI VDC	APPTX PESTICIDES	APPTX HERBICIDES	APPTX PLOXINS	APPTX EXTRA SHRE	
METHOD:	SW3510/SW8270	SW3520/SW8080	SW3520/SW8150	SW3520/SW8280		
PARAMETER:	APPTX ICP TOTAL	APPTX ICP DISS	APPTX CYANIDE	APPTX SULLFIDE	NITRATE	
METHOD:	SW3005/SW6010	SW3005/SW600			E353.24 + E354.1	

Chain-of-Custody Record

PROJECT NAME KIRTLAND AFB IRP PROJECT NO. 463536001 P.O. NO.

Relinquished by: (Signature)	Received by: (Signature)	Date	Time
<i>Fl. Eileen Royal</i>	AIRBORNE EXPRESS	12/5/90	1515
Relinquished by: (Signature)	Received by: (Signature)	Date	Time
	<i>Justin Chappell</i>	12-7-90	0900
Relinquished by: (Signature)	Received at lab by: (Signature)	Date	Time
Relinquished from lab by: (Signature)	Received by: (Signature)	Date	Time

Comments (Only 50 characters stored in NWIS)

Record 5 WELL NR TIJERAS ARROYO DOWN STR.

Record 6

Total number of sample bottles for this request: 19

SHIP TO: Enseco-Rocky Mountain Analytical  
4955 Yarrow Street  
Arvada, CO 80002  
(303) 421-6611  
ATTENTION: LINDSAY BRYER