

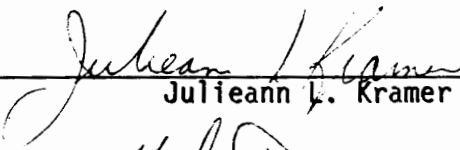
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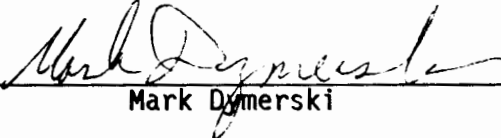
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ANALYTICAL RESULTS  
FOR  
U.S. GEOLOGICAL SURVEY  
ENSECO-RMAL NO. 022923

JUNE 24, 1992

Reviewed by:

  
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Julieann L. Kramer

  
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Mark Dymerski

KAFB1229  


## I. OVERVIEW

On May 22, 1992, Enseco-Rocky Mountain Analytical Laboratory received three aqueous sample from U.S. Geological Survey.

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:

- I. Overview
- II. Sample Description Information/Analytical Test Requests
- III. Analytical Results
- IV. Quality Control Report

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

## **II. SAMPLE DESCRIPTION INFORMATION/ANALYTICAL TEST REQUESTS**

### **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**

<b>Lab ID</b>	<b>Client ID</b>	<b>Matrix</b>	<b>Sampled Date</b>	<b>Time</b>	<b>Received Date</b>
022923-0001-SA	KAFB090217-2	AQUEOUS	21 MAY 92	08:15	22 MAY 92
022923-0002-SA	KAFB090216-2	AQUEOUS	21 MAY 92	10:50	22 MAY 92
022923-0003-SA	MVMWK09-2	AQUEOUS	21 MAY 92	14:00	22 MAY 92

**ANALYTICAL TEST REQUESTS  
 for  
 U.S. Geological Survey**

<b>Lab ID:</b> 022923	<b>Group Code</b>	<b>Analysis Description</b>	<b>Custom Test?</b>
0001 - 0002	A	Nitrate Plus Nitrite	N
		Total Organic Carbon (TOC)	N
		Total Organic Halogen (TOX)	N
		Halogenated Volatile Organics-2nd Column Analysis	N
		Halogenated Volatile Organics	N
0003	B	Nitrate Plus Nitrite	N
		Halogenated Volatile Organics-2nd Column Analysis	N
		Halogenated Volatile Organics	N

### III. 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. The date prepared is typically the date an extraction or digestion was initiated. For volatile organic compounds in water, the date prepared is the date the screening of the sample was performed.

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.

In addition, surrogate recovery data is presented for all GC/MS analyses. The surrogate recovery is an indication of the affect of the sample matrix on the performance of the method. The results from the Standard Enseco QA/QC Program, which generates data which are independent of matrix effects, is given in Section IV.

The analytical data reported are subject to the following limitations of the analytical methodology:

## Metals

All nominal reporting limits for metals have been established from instrument detection limit (IDL) evaluations and represent the level above which reliable data can be routinely obtained. Low level standards are analyzed seven times on three non-consecutive days on each instrument. The standard deviations of the three runs are summed to yield the IDL. Nominal reporting limits are generally 2-5 times the IDL (consistent with the American Chemical Society definition for the Limit of Quantification). The ability to achieve these quoted reporting limits is verified each quarter. Reporting limits above the nominal levels are often submitted due to matrix interferences or elevated analyte levels.

Reporting limits for metals analyzed by Inductively Coupled Plasma (ICP) are typically raised only for dilution due to an analyte exceeding the instrument linear range. Background and interelement interferences are corrected automatically and do not require dilution.

Metals analyzed by Graphite Furnace Atomic Absorption (GFAA) are subject to matrix interferences. Consequently, Enseco protocol is to analyze a spiked aliquot with every sample. The severity of the interference, based upon analyte level and spike recovery, is assessed against specific criteria and the need for an elevated reporting limit or dilution is determined.

The analysis of mercury by Cold Vapor Atomic Absorption (CVAA) is generally free from matrix interferences. As with ICP, reporting limits are raised only for dilution due to a sample concentration exceeding the linear range of the instrument.

Reporting limits for metals analyzed by inductively coupled plasma - mass spectrometry (ICPMS) may be raised for dilution due to an analyte exceeding the linear range of the instrument or matrix interference. An internal standard is analyzed with each sample to measure the degree of matrix interference - a dilution is performed when appropriate. Isobaric and

molecular interferences are corrected at the instrument and do not require dilution.



Halogenated Volatile Organics

Method 8010

Client Name: U.S. Geological Survey

Client ID: KAFB090217-2

Lab ID: 022923-0001-SA

Matrix: AQUEOUS

Authorized: 22 MAY 92

Sampled: 21 MAY 92

Prepared: NA

Received: 22 MAY 92

Analyzed: 22 MAY 92

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	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	86	%

(continued on following page)

ND = Not detected

NA = Not applicable

Reported By: Bret Collins

Approved By: Donna Reinwald

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Halogenated Volatile Organics (CONT.)

Method 8010

Client Name: U.S. Geological Survey

Client ID: KAFB090217-2

Lab ID: 022923-0001-SA

Matrix: AQUEOUS

Authorized: 22 MAY 92

Sampled: 21 MAY 92

Prepared: NA

Received: 22 MAY 92

Analyzed: 22 MAY 92

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

ND = Not detected

NA = Not applicable

Reported By: Bret Collins

Approved By: Donna Reinwald

Halogenated Volatile Organics

Method 8010

Client Name: U.S. Geological Survey

Client ID: KAFB090216-2

Lab ID: 022923-0002-SA

Matrix: AQUEOUS

Authorized: 22 MAY 92

Sampled: 21 MAY 92

Prepared: NA

Received: 22 MAY 92

Analyzed: 22 MAY 92

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	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	0.86	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: Bret Collins

Approved By: Donna Reinwald

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Halogenated Volatile Organics (CONT.)

Method 8010

Client Name: U.S. Geological Survey

Client ID: KAFB090216-2

Lab ID: 022923-0002-SA

Matrix: AQUEOUS

Authorized: 22 MAY 92

Sampled: 21 MAY 92

Prepared: NA

Received: 22 MAY 92

Analyzed: 22 MAY 92

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

ND = Not detected

NA = Not applicable

Reported By: Bret Collins

Approved By: Donna Reinwald

Halogenated Volatile Organics-2nd Column Analysis

Method 8010

Client Name: U.S. Geological Survey

Client ID: KAFB090216-2

Lab ID: 022923-0002-SA

Matrix: AQUEOUS

Authorized: 22 MAY 92

Sampled: 21 MAY 92

Prepared: NA

Received: 22 MAY 92

Analyzed: 22 MAY 92

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	ND	ug/L	0.30	
1,2-Dichloroethane	0.67	ug/L	0.50	
1,1,1-Trichloroethane	ND	ug/L	0.20	
Carbon tetrachloride	ND	ug/L	0.60	
Bromodichloromethane	0.70	ug/L	0.50	L
1,2-Dichloropropane	ND	ug/L	0.50	
trans-1,3-Dichloropropene	ND	ug/L	2.0	
Trichloroethene	0.70	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 88 %

(continued on following page)

ND = Not detected  
 NA = Not applicable

Reported By: Bret Collins

Approved By: Donna Reinwald

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

Method 8010

Client Name: U.S. Geological Survey

Client ID: KAFB090216-2

Lab ID: 022923-0002-SA

Matrix: AQUEOUS

Authorized: 22 MAY 92

Sampled: 21 MAY 92

Prepared: NA

Received: 22 MAY 92

Analyzed: 22 MAY 92

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

ND = Not detected  
NA = Not applicable

Reported By: - Bret Collins

Approved By: Donna Reinwald

Halogenated Volatile Organics

Method 8010

Client Name: U.S. Geological Survey

Client ID: MVMWK09-2

Lab ID: 022923-0003-SA

Matrix: AQUEOUS

Authorized: 22 MAY 92

Sampled: 21 MAY 92

Prepared: NA

Received: 22 MAY 92

Analyzed: 22 MAY 92

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	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

Surrogate

Recovery

Bromochloromethane

91 %

ND = Not detected

NA = Not applicable

Reported By: Bret Collins

Approved By: Donna Reinwald

General Inorganics

Client Name: U.S. Geological Survey  
 Client ID: KAFB090217-2  
 Lab ID: 022923-0001-SA  
 Matrix: AQUEOUS  
 Authorized: 22 MAY 92

Sampled: 21 MAY 92  
 Prepared: See Below

Received: 22 MAY 92  
 Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Nitrate plus Nitrite	ND	mg/L	0.050	353.2	NA	14 JUN 92
Total Organic Carbon	1.0	mg/L	0.50	9060	NA	16 JUN 92
Total Organic Halogen as Cl	ND	ug/L	30.0	9020	NA	17 JUN 92

ND = Not detected  
 NA = Not applicable

Reported By: Dan Appelhans

Approved By: Dave Roberts



General Inorganics

Client Name: U.S. Geological Survey  
 Client ID: KAFB090216-2  
 Lab ID: 022923-0002-SA  
 Matrix: AQUEOUS  
 Authorized: 22 MAY 92

Sampled: 21 MAY 92  
 Prepared: See Below

Received: 22 MAY 92  
 Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Nitrate plus Nitrite	1.3	mg/L	0.050	353.2	NA	14 JUN 92
Total Organic Carbon	1.3	mg/L	0.50	9060	NA	16 JUN 92
Total Organic Halogen as Cl	ND	ug/L	30.0	9020	NA	17 JUN 92

ND = Not detected  
 NA = Not applicable

Reported By: Dan Appelhans

Approved By: Dave Roberts

General Inorganics

Client Name: U.S. Geological Survey  
 Client ID: MVMWK09-2  
 Lab ID: 022923-0003-SA  
 Matrix: AQUEOUS  
 Authorized: 22 MAY 92

Sampled: 21 MAY 92  
 Prepared: See Below

Received: 22 MAY 92  
 Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Nitrate plus Nitrite	25.2	mg/L	1.0	353.2	NA	14 JUN 92

ND = Not detected  
 NA = Not applicable

Reported By: Matt Coyle

Approved By: Dave Roberts

#### IV. QUALITY CONTROL REPORT

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 surrogate compounds appropriate to the method being used. In cases where no surrogate is available, (e.g., metals or conventional analyses) a single DCS serves as the control sample. An SCS is prepared for each sample lot for which the DCS pair are not analyzed. The recovery of the SCS is charted in exactly the same manner as described for the DCS, and provides a daily check on the performance of the method.

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  
 Organics by Chromatography

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
022923-0001-SA	AQUEOUS	601-A	20 MAY 92-7F	22 MAY 92-7F
022923-0002-SA	AQUEOUS	601-A	20 MAY 92-7F	22 MAY 92-7F
022923-0002-SA	AQUEOUS	601-A	20 MAY 92-7F	22 MAY 92-7F
022923-0003-SA	AQUEOUS	601-A	20 MAY 92-7F	22 MAY 92-7F

DUPLICATE CONTROL SAMPLE REPORT  
Organics by Chromatography

Analyte	Spiked	Concentration		Measured	AVG	Accuracy		Precision	
		DCS1	DCS2			DCS	Limits	(RPD)	DCS Limit
Category:	601-A								
Matrix:	AQUEOUS								
QC Lot:	20 MAY 92-7F								
Concentration Units:	ug/L								
1,1-Dichloroethane	5.0	4.36	4.42	4.39	88	68-122	1.4	13	
Chloroform	5.0	4.81	4.34	4.58	92	71-145	1.0	13	
Bromodichloromethane	10	8.36	8.61	8.48	85	62-118	2.9	15	
Trichloroethene	5.0	4.38	4.30	4.34	87	70-129	1.8	14	
Chlorobenzene	5.0	4.03	3.99	4.01	80	62-115	1.0	19	

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

SINGLE CONTROL SAMPLE REPORT  
Organics by Chromatography

Analyte	Concentration		Accuracy(%)	
	Spiked	Measured	SCS	Limits
Category: 601-A Matrix: AQUEOUS QC Lot: 20 MAY 92-7F    QC Run: 22 MAY 92-7F Concentration Units: ug/L				
Bromochloromethane	5.00	4.33	87	50-144

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



METHOD BLANK REPORT  
Organics by Chromatography

Analyte	Result	Units	Reporting Limit
Test: 601-AFIR-A			
Matrix: AQUEOUS			
QC Lot: 20 MAY 92-7F QC Run: 22 MAY 92-7F			
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  
Organics by Chromatography (cont.)

Analyte	Result	Units	Reporting Limit
Test: 601-AFIR-2-A			
Matrix: AQUEOUS			
QC Lot: 20 MAY 92-7F QC Run: 22 MAY 92-7F			
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  
Organics by Chromatography (cont.)

Analyte	Result	Units	Reporting Limit
Test: 601-AFIR-A			
Matrix: AQUEOUS			
QC Lot: 20 MAY 92-7F QC Run: 22 MAY 92-7F			
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  
Wet Chemistry Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
022923-0001-SA	AQUEOUS	NO3-A	14 JUN 92-7K	-
022923-0001-SA	AQUEOUS	TOC-A	16 JUN 92-7A	-
022923-0001-SA	AQUEOUS	TOX-A	17 JUN 92-7A	-
022923-0002-SA	AQUEOUS	NO3-A	14 JUN 92-7K	-
022923-0002-SA	AQUEOUS	TOC-A	16 JUN 92-7A	-
022923-0002-SA	AQUEOUS	TOX-A	17 JUN 92-7A	-
022923-0003-SA	AQUEOUS	NO3-A	14 JUN 92-7L	-

DUPLICATE CONTROL SAMPLE REPORT  
 Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Concentration Measured		AVG	Accuracy Average(%)		Precision (RPD)		
		DCS1	DCS2		DCS	Limits	DCS	Limit	
Category: NO3-A Matrix: AQUEOUS QC Lot: 14 JUN 92-7K Concentration Units: mg/L									
Nitrate as N	2.0	1.96	1.96	1.96	98	91-109	0.0	10	
Category: TOC-A Matrix: AQUEOUS QC Lot: 16 JUN 92-7A Concentration Units: mg/L									
Total Organic Carbon	25	26.1	26.1	26.1	104	91-109	0.0	20	
Category: TOX-A Matrix: AQUEOUS QC Lot: 17 JUN 92-7A Concentration Units: ug Cl/L									
Total Organic Halogen as Cl	100	100	87.6	93.8	94	80-120	13	20	
Category: NO3-A Matrix: AQUEOUS QC Lot: 14 JUN 92-7L Concentration Units: mg/L									
Nitrate as N	2.0	2.01	1.95	1.98	99	91-109	3.0	10	

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

# Appendix

ENSECO ANALYTICAL SERVICES REQUEST FORM

27573-02

**Special Handling** (Circle as appropriate and explain in record 5)

Hazardous material

SAMPLE  
KAFB 090216-2  
Station Name

Field ID  
USGS/WRD/NM  
Field Office

KAFB-IRP  
Project

TOM CROUCH  
MIKO ROYBAL  
Collector

Site Type (circle one)

- SW - Surface Water
- GW - Ground Water
- ME - Meteorological
- LK - Lake
- ES - Estuary
- SP - Spring
- SS - Special Source

(505)262-5399  
Phone (FTS)

File Deposition\*  
(Circle one)

- Q - WATSTORE
- X - Lab File

For Laboratory Use Only

Sample identification

KAFB 090216-2  
Station ID or Unique Number\*

463536001  
Project Account #

1992 Year\*    05 Month\*    21 Day\*    1050 Time\*         Month         Day         Time    NM State Code\*    035 District/ User Code\*    001 County Code

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:	<del>APPX IX-VOC</del>		<del>APPX IX-SEMIVOC</del>		<del>APPX IX-PESTICIDES</del>		<del>APPX IX-HERBICIDES</del>
METHOD:	<del>SW5030/SW8240</del>		<del>SW3510/SW8270</del>		<del>SW3520/SW8080</del>		<del>SW3520/SW8150</del>
PARAMETER:	<del>APPX IX-DIOXINS</del>		<del>APPX IX-METALS(TOTAL)</del>		<del>APPX IX-METALS(DISS)</del>		<del>APPX IX-CYANIDE</del>
METHOD:	<del>SW3520/SW8280</del>		<del>SW3005/SW6010</del>		<del>SW3005/SW6010</del>		<del>SW9010</del>
PARAMETER:	<del>APPX IX-SULFIDE</del>		<u>NITRATE &amp; NITRITE</u>		<u>URANIUM, GROSS ALPHA &amp; BETA</u>		<u>VOX</u>
METHOD:	<del>SW 9030</del>		<u>E353.2</u>		<u>D2907,</u>		<u>SW5030/SW8010</u>

~~EXTRA SAMPLES/~~

Chain-of-Custody Record

TOC, TOX  
EHS.1, SW 9020

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

Relinquished by: (Signature) <u>Miko Roybal</u>	Received by: (Signature) <u>FEDERAL EXPRESS</u>	Date <u>21 MAY 92</u>	Time <u>1615</u>
Relinquished by: (Signature)	Received by: (Signature) <u>B. MUSIL</u>	Date <u>5-22-92</u>	Time <u>800</u>
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 SAMPLE FROM WELL NR. DOWNSTREAM OF TIERAS ARROYO.

Record 6     

Total number of sample bottles for this request: 5

SHIP TO:  
Enseco-Rocky Mountain Analytical  
4955 Yarrow Street  
Arvada, CO 80002  
(303) 421-6611  
ATTENTION: TRACY CONROY / JULIE CRAMER

ENSECO ANALYTICAL SERVICES REQUEST FORM

22973-03

**Special Handling** (Circle as appropriate and explain in record 5)  
 Hazardous material SAMPLE

**Site Type (circle one)**  
 SW - Surface Water  
 GW - Ground Water  
 ME - Meteorological  
 LK - Lake  
 ES - Estuary  
 SP - Spring  
 SS - Special Source

Station Name: KAFB MVMWK 09-2  
 Field ID: USGS/WRD/NM  
 Field Office: KAFB-IRP  
 Project: TOM CROUCH MIKO ROYBAL  
 Collector: (505)262-5399  
 Phone (FTS):

**File Deposition\*** (Circle one)  
 Q - WATSTORE  
 X - Lab File

**Sample identification**  
 Station ID or Unique Number\*: KAFB MVMWK 09-2  
 Project Account #: 463536001

Year\*: 1992 Month\*: 05 Day\*: 21 Time\*: 1400  
 Begin Date: 1992-05-21 1400  
 Composite End Date:   
 State Code\*: NM District/ User Code\*: 035 County Code: 001

**Analysis level codes and schedules**

Parameter	Method	Parameter	Method	Parameter	Method	Parameter	Method
APPX IX-VOG	SW5030/SW8240	APPX IX-SEMIVOC	SW3510/SW8270	APPX IX-PESTICIDES	SW3520/SW8080	APPX IX-HERBICIDES	SW3520/SW8150
APPX IX-DIOXINS	SW3520/SW8280	APPX IX-METALS (TOTAL)	SW3005/SW6010	APPX IX-METALS (DISS)	SW3005/SW6010	APPX IX-CYANIDE	SW9010
APPX IX-SULFIDE	SW 9030	NITRATE & NITRITE	E353.2	URANIUM, GROSS ALPHA & BETA	D2907, E900	VOX	SW5030/SW8010

EXTRA SAMPLES/

**Chain-of-Custody Record**

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

Relinquished by: (Signature) <u>Miko Roybal</u>	Received by: (Signature) FEDERAL EXPRESS	Date <u>21 MAY 92</u>	Time <u>1615</u>
Relinquished by: (Signature)	Received by: (Signature) <u>B. MUSIL</u>	Date <u>5-22-92</u>	Time <u>800</u>
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 SAMPLE FROM MVMWK WELL

Record 6

Total number of sample bottles for this request: 4

**SHIP TO:**  
 Enseco-Rocky Mountain Analytical  
 4955 Yarrow Street  
 Arvada, CO 80002  
 (303) 421-6611  
 ATTENTION: TRACY CONROY / JULIE CRAMER