Analytical Resources, Incorporated
Analytical Chemists and Consultants

AMEC E&E
Received
SEP 20 2011
SEATTLE ORG. 5009

September 15, 2011

John Long
AMEC/Geomatrix
600 University Suite 600
Seattle, WA 98101

RE: Client Project: Former Rhone Poulenc- 8769 Shoreline Investigation
ARI Job Number: TK88, TK89

Dear John:

Please find enclosed the final data package for samples for the project referenced above. ARI received three water samples and one trip blank on September 2, 2011.

Please refer to the case narrative for details on the analyses of these samples.

A copy of this package will be kept on file at ARI. If you have questions or problems, please feel free to contact me at any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
206/695-6211
kellyb@arilabs.com

Enclosures

cc: file TK88_TK89

KFB/esj

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

Chain of Custody Documentation

ARI Job ID: TK88, TK89

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

ARI Assigned Number: TK88
Turn-around Requested: STANDARD
Page: 1 of 1
Date: 9/2/11
Ice Present? Y
ARI Client Company: AMEC
Phone: (206) 342-1773
No. of Coolers: 1
Cooler Temps: 2.4
Client Contact: JOHN LONG / NIK BACHER
Client Project Name: FNP 2011 SHORELINE INVESTIGATION
Client Project #: 8769
Samplers: NIK BACHER / DEVIN O'REILLY

Analysis Requested

Sample ID	Date	Time	Matrix	No. Containers	TOTAL METALS 6010B	MERCURY 7470A	pH 150.1	VOCs 8260C					Notes/Comments
FNP-090211-001	9/2/11	1250	H_2O	5	X	X	X	X					
FNP-090211-002	↓	1445	↓	5	X	X	X	X					
FNP-090211-003	↓	1515	↓	5	X	X	X	X					
TRIP BLANK	↓		↓	2				X					

Comments/Special Instructions
METALS INCLUDE: Al, As, Cd, Cr, Cu, Pb, Ni, Se, Th, V, Zn - SEE COC.
VOAS ARE NOT PRESERVED

Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
Printed Name: Nik Bacher	Printed Name: Jennifer Millsap	Printed Name:	Printed Name:
Company: AMEC	Company: ARI	Company:	Company:
Date & Time: 9/2/11 1615	Date & Time: 9/2/11 1615	Date & Time:	Date & Time:

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: AMEC

Project Name: FRP 2011 Shoaling Investigation

COC No(s): _____ (NA)

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: TK88

Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES (NO)

Were custody papers included with the cooler? ..... (YES) NO

Were custody papers properly filled out (ink, signed, etc.) ..... (YES) NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)..... 2.4 ____ ____ ____ ____

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 90941619

Cooler Accepted by: JM Date: 9/2/11 Time: 1615

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? ..... YES (NO)

What kind of packing material was used? ... Bubble Wrap (Wet Ice) Gel Packs Baggies (Foam Block) Paper Other: _____

Was sufficient ice used (if appropriate)? ..... NA (YES) NO

Were all bottles sealed in individual plastic bags? ..... YES (NO)

Did all bottles arrive in good condition (unbroken)? ..... (YES) NO

Were all bottle labels complete and legible? ..... (YES) NO

Did the number of containers listed on COC match with the number of containers received? ..... (YES) NO

Did all bottle labels and tags agree with custody papers? ..... (YES) NO

Were all bottles used correct for the requested analyses? ..... (YES) NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA (YES) NO

Were all VOC vials free of air bubbles? ..... NA (YES) NO

Was sufficient amount of sample sent in each bottle? ..... (YES) NO

Date VOC Trip Blank was made at ARI..... NA 8/29/11

Was Sample Split by ARI : (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: JM Date: 9/2/11 Time: 1620

*** Notify Project Manager of discrepancies or concerns ***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:

Small Air Bubbles ~2mm	Peabubbles 2-4 mm	LARGE Air Bubbles > 4 mm	
			Small → "sm"
			Peabubbles → "pb"
			Large → "lg"
			Headspace → "hs"

PRESERVATION VERIFICATION 09/02/11

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **TK88**

PC: Kelly
VTSR: 09/02/11

Inquiry Number: NONE
Analysis Requested: 09/05/11
Contact: Long, John
Client: AMEC Geomatrix
Logged by: JM
Sample Set Used: Yes-481
Validatable Package: No
Deliverables:

Project #: 8769
Project: FRP 2011 Shoreline Investigation
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	AK102 <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
11-19092 **TK88A**	FRP-090211-001						TOT MW															
11-19093 **TK88B**	FRP-090211-002						TOT															
11-19094 **TK88C**	FRP-090211-003						TOT															

Checked By JM Date 9/2/11

TK88 : 000035

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: AMEC

Project Name: FRP 2011 Shoreline Investigation

COC No(s): _____ (NA)

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: TK89

Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES (NO)

Were custody papers included with the cooler? ..... (YES) NO

Were custody papers properly filled out (ink, signed, etc.) ..... (YES) NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)..... 2.4 ___ ___ ___

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 90941619

Cooler Accepted by: JM Date: 9/2/11 Time: 1615

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? ..... YES (NO)

What kind of packing material was used? ... Bubble Wrap (Wet Ice) Gel Packs Baggies (Foam Block) Paper Other: _____

Was sufficient ice used (if appropriate)? ..... NA (YES) NO

Were all bottles sealed in individual plastic bags? ..... YES (NO)

Did all bottles arrive in good condition (unbroken)? ..... (YES) NO

Were all bottle labels complete and legible? ..... (YES) NO

Did the number of containers listed on COC match with the number of containers received? ..... (YES) NO

Did all bottle labels and tags agree with custody papers? ..... (YES) NO

Were all bottles used correct for the requested analyses? ..... (YES) NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA (YES) NO

Were all VOC vials free of air bubbles? ..... NA (YES) NO

Was sufficient amount of sample sent in each bottle? ..... (YES) NO

Date VOC Trip Blank was made at ARI..... NA 8/29/11

Was Sample Split by ARI : (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: JM Date: 9/2/11 Time: 1620

*** Notify Project Manager of discrepancies or concerns ***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:

Small Air Bubbles <2mm	Peabubbles 2-4 mm	LARGE Air Bubbles > 4 mm	Small → "sm"
			Peabubbles → "pb"
			Large → "lg"
			Headspace → "hs"

PRESERVATION VERIFICATION 09/02/11

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **TK89**

Inquiry Number: NONE
Analysis Requested: 09/05/11
Contact: Long, John
Client: AMEC Geomatrix
Logged by: JM
Sample Set Used: Yes-481
Validatable Package: No
Deliverables:

PC: Kelly
VTSR: 09/02/11

Project #: 8769
Project: FRP 2011 Shoreline Investigation
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	AK102 <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
11-19096 **TK89A**	FRP-090211-001						TOT MM															
11-19097 **TK89B**	FRP-090211-002						TOT															
11-19098 **TK89C**	FRP-090211-003						TOT															

Checked By JM Date 9/2/11

TK89 : 000007

Case Narrative, Data Qualifiers, Control Limits

ARI Job ID: TK88, TK89

Case Narrative

AMEC/Geomatrix
Client Project: Former Rhone Poulenc- 8769 Shoreline Investigation
ARI Job Number: TK88, TK89
Water
September 19, 2011

Sample Receipt:

Please find enclosed the original chain of custody (COC) record and analytical results for the project referenced above. Analytical Resources, Inc. accepted three water samples and one trip blank in good condition on 9/02/11. Please see the enclosed Cooler Receipt Form for further details.

Volatiles by 8260C

The samples were analyzed on 9/5/11 - within the method recommended holding time.

Initial calibration (s): All analytes of interest were within method acceptance criteria.

Continuing calibration (s): The 9/5/11 VOCs CCAL is out of control low for acrolein. All associated samples that contain this analyte have been flagged with a "Q" qualifier.

LCS/LCSD/RPDs: All RPDs and recoveries are within control limits.

Surrogates: All surrogate recoveries were within control limits.

Method Blank: The method blank contained methylene chloride and naphthalene. All associated samples that contain this analyte have been flagged with a "B" qualifier.

Samples: There were no anomalies associated with these samples.

Metals Analysis (6010, 200.8 and 7000 series)

All samples were digested on 9/6/11 - within the method recommended holding time and analyzed on 9/8/11 and 9/9/11.

Initial calibration (s): All analytes of interest were within method acceptance criteria.

Continuing calibration (s): All analytes of interest were within method acceptance criteria.

Internal Standards: Internal standard areas were within control limits

LCS/LCSD/RPDs: All percent recoveries and RPDs are within control limits.

Samples: There were no anomalies associated with these samples.

Method Blank (s): The method blank was free of contamination.

Matrix spike/ Matrix spike duplicate/RPD(s): All percent recoveries and RPDs are in control.

pH by method 150.1:

The samples were analyzed on 9/2/11 within method recommended holding time.

Initial calibration (s): All analytes of interest were within method acceptance criteria.

LCS/LCSD/RPDs: The percent recovery is within control limits.

Sample duplicate/ RPD(s): The RPD is within control limits.

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: TK88
Client: AMEC Geomatrix
Project Event: 8769
Project Name: FRP 2011 Shoreline Investigation

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	FRP-090211-001	TK88A	11-19092	Water	09/02/11 12:50	09/02/11 16:15
2.	FRP-090211-002	TK88B	11-19093	Water	09/02/11 14:45	09/02/11 16:15
3.	FRP-090211-003	TK88C	11-19094	Water	09/02/11 15:15	09/02/11 16:15
4.	Trip Blank	TK88D	11-19095	Water	09/02/11	09/02/11 16:15

Printed 09/02/11

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: TK89
Client: AMEC Geomatrix
Project Event: 8769
Project Name: FRP 2011 Shoreline Investigation

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	FRP-090211-001	TK89A	11-19096	Water	09/02/11 12:50	09/02/11 16:15
2.	FRP-090211-002	TK89B	11-19097	Water	09/02/11 14:45	09/02/11 16:15
3.	FRP-090211-003	TK89C	11-19098	Water	09/02/11 15:15	09/02/11 16:15

Printed 09/02/11

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Data Reporting Qualifiers

Effective 2/14/2011

Inorganic Data

U — Indicates that the target analyte was not detected at the reported concentration

* — Duplicate RPD is not within established control limits

B — Reported value is less than the CRDL but ≥ the Reporting Limit

N — Matrix Spike recovery not within established control limits

NA — Not Applicable, analyte not spiked

H — The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible

L — Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U — Indicates that the target analyte was not detected at the reported concentration

* — Flagged value is not within established control limits

B — Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.

J — Estimated concentration when the value is less than ARI's established reporting limits

D — The spiked compound was not detected due to sample extract dilution

E — Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

Q — Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20%Drift or minimum RRF).

TK88 : 00013

S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte

NA The flagged analyte was not analyzed for

NR Spiked compound recovery is not reported due to chromatographic interference

NS The flagged analyte was not spiked into the sample

M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses

M2 The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.

N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"

Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.

EMPC Estimated Maximum Possible Concentration (EMPC) defined in EPA Statement of Work DLM02.2 as a value "calculated for 2,3,7,8-substituted isomers for which the quantitation and /or confirmation ion(s) has signal to noise in excess of 2.5, but does not meet identification criteria" **(Dioxin/Furan analysis only)**

C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column

P The analyte was detected on both chromatographic columns but the quantified values differ by ≥40% RPD with no obvious chromatographic interference

X Analyte signal includes interference from polychlorinated diphenyl ethers. **(Dioxin/Furan analysis only)**

Z Analyte signal includes interference from the sample matrix or perfluorokerosene ions. **(Dioxin/Furan analysis only)**

TK88 : 00014

Geotechnical Data

A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.

F Samples were frozen prior to particle size determination

SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations

SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis

W Weight of sample in some pipette aliquots was below the level required for accurate weighting

TK88 : 00015

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Spike Recovery Control Limits for Analysis of Aqueous Samples Volatile Organic Compounds (VOA) EPA SW-846 Methods 8260C 10 mL Purge Volume [1,6]

Effective: 8/30/2010

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. http://www.arilabs.com/portal/downloads/ARI-CLs.zip

	ARI Control Limits	ARI ME Control Limits[2]
LCS Spike Recovery [5]		
Dichlorodifluoromethane	69 - 122	60 - 131
Chloromethane	76 - **120**	69 - 123
Vinyl Chloride	**80 - 120**	75 - 123
Bromomethane	71 - 120	63 - 129
Chloroethane	**80 - 120**	75 - 124
1,1,2-Trichloro-1,2,2-trifluoroethane	**80** - 121	76 - 128
Acrolein	69 - 126	60 - 136
Acetone	71 - **120**	64 - **120**
1,1-Dichloroethene	**80 - 120**	79 - 122
Bromoethane	**80 - 120**	80 - 121
Methyl Iodide	76 - 120	69 - 127
Methylene Chloride	**80 - 120**	77 - **120**
Acrylonitrile	79 - **120**	74 - **120**
Methyl tert-Butyl Ether	**80 - 120**	77 - 121
Carbon Disulfide	**80 - 120**	78 - 121
trans-1,2-Dichloroethene	**80 - 120**	**80 - 120**
Vinyl Acetate	**80 - 120**	76 - **120**
1,1-Dichloroethane	**80 - 120**	**80 - 120**
2-Butanone	**80 - 120**	76 - **120**
2,2-Dichloropropane	**80 - 120**	77 - 120
cis-1,2-Dichloroethene	**80 - 120**	**80 - 120**
Chloroform	**80 - 120**	**80 - 120**
Bromodichloromethane	**80 - 120**	**80 - 120**
1,1,1-Trichloroethane	**80 - 120**	**80 - 120**
1,1-Dichloropropene	**80 - 120**	**80 - 120**
Carbon Tetrachloride	**80 - 120**	**80** - 123
1,2-Dichloroethane	**80 - 120**	**80 - 120**
Benzene	**80 - 120**	**80 - 120**
Trichloroethene	**80 - 120**	**80** - 120
1,2-Dichloropropane	**80 - 120**	**80 - 120**
Bromochloromethane	**80 - 120**	**80 - 120**
Dibromomethane	**80 - 120**	**80 - 120**
2-Chloroethylvinylether	**80 - 120**	75 - **120**
4-Methyl-2-Pentanone	**80 - 120**	78 - **120**
cis-1,3-Dichloropropene	**80 - 120**	**80 - 120**
Toluene	**80 - 120**	**80 - 120**
trans-1,3-Dichloropropene	**80 - 120**	**80 - 120**

TK88 : 00015

2-Hexanone	80 - 120	75 - 120
1,1,2-Trichloroethane	80 - 120	80 - 120
1,3-Dichloropropane	80 - 120	80 - 120
Tetrachloroethene	80 - 120	80 - 120
Dibromochloromethane	80 - 120	80 - 120
Ethylene Dibromide	80 - 120	80 - 120
Chlorobenzene	80 - 120	80 - 120
Ethylbenzene	80 - 120	80 - 121
1,1,2,2-Tetrachloroethane	80 - 120	78 - 120
m,p-Xylene	80 - 120	80 - 120
o-Xylene	80 - 120	80 - 120
Styrene	80 - 120	80 - 122
Trichlorofluoromethane	80 - 120	78 123
Isopropylbenzene	80 - 120	79 - 121
Bromoform	80 - 120	79 - 120
1,1,1,2-Tetrachloroethane	80 - 120	80 - 120
1,2,3-Trichloropropane	80 - 120	77 - 120
trans-1,4-Dichloro-2-butene	74 - 122	66 - 130
n-Propylbenzene	80 - 120	80 - 120
Bromobenzene	80 - 120	78 - 120
1,3,5-Trimethylbenzene	80 - 120	80 - 120
2-Chlorotoluene	80 - 120	80 - 120
4-Chlorotoluene	80 - 120	80 - 120
tert-Butylbenzene	80 - 120	80 - 121
1,2,4-Trimethylbenzene	80 - 120	80 - 120
sec-Butylbenzene	80 - 120	80 - 121
4-Isopropyltoluene	80 - 120	80 - 123
1,3-Dichlorobenzene	80 - 120	80 - 120
1,4-Dichlorobenzene	80 - 120	80 - 120
n-Butylbenzene	80 - 120	80 - 122
1,2-Dichlorobenzene	80 - 120	80 - 120
1,2-Dibromo-3-chloropropane	76 - 120	71 - 120
1,2,4-Trichlorobenzene	77 - 120	71 - 120
Hexachloro-1,3-butadiene	77 - 120	70 - 127
Naphthalene	76 - 120	70 - 120
1,2,3-Trichlorobenzene	79 - 120	74 - 120
MB/LCS Surrogate Recovery		
Dibromofluoromethane	80 - 120	(3)
d4-1,2-Dichloroethane	80 - 120	(3)
d8-Toluene	80 - 120	(3)
4-Bromofluorobenzene	80 - 120	(3)
d4-1,2-Dichlorobenzene	80 - 120	(3)
Sample Surrogate Recovery		
Dibromofluoromethane	80 - 120	(3)

TK88 : 00017

d4-1,2-Dichloroethane	**80 - 120**	(3)
d8-Toluene	**80 - 120**	(3)
4-Bromofluorobenzene	**80 - 120**	(3)
D4-1,2-Dichlorobenzene	**80 - 120**	(3)

(1) Control Limits calculated using all data generated 7/1/09 through 6/30/10.
(2) **ME** = A **marginal exceedance** defined in the NELAC Standard[4] as beyond the LCS-CL but still within the ME limits. ME limits are between 3 and 4 standard deviations around the mean. A maximum of four marginal exceedances are acceptable. Five or more marginal exceedances require corrective action.
(3) Marginal Exceedances not allowed for surrogate standards. A corrective action is required for each surrogate recovery outside of the control limit range.
(4) **2003 NELAC Standard (EPA/600/R-04/003), July 2003**, Chapter 5, pages 251-252.
(5) Laboratory Control Sample (LCS) spike recovery control limits also used as advisory control limits for sample matrix spike (MS) analyzes. MS recovery values are advisory and not used to assess the acceptability of an analytical batch.
(6) Highlighted control limits (**bold font**) are adjusted from the calculated values as follows:

a) ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.

b) Control limits for analyzes with no separate preparation procedure are adjusted to reflect the minimum uncertainty in the calibration of the instrument allowed by the referenced analytical method.

TK88 : 00018

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Summary of Laboratory Control Limits Metals Analyses (All Methods & Sample Matrices)

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. http://www.arilabs.com/portal/downloads/ARI-CLs.zip

Element	Matrix Spike Recovery	LCS Recovery	Replicate RPD
Aluminum	75 - 125	80 - 120	≤ 20%
Antimony	75 - 125	80 - 120	≤ 20%
Arsenic	75 - 125	80 - 120	≤ 20%
Barium	75 - 125	80 - 120	≤ 20%
Beryllium	75 - 125	80 - 120	≤ 20%
Boron	75 - 125	80 - 120	≤ 20%
Cadmium	75 - 125	80 - 120	≤ 20%
Calcium	75 - 125	80 - 120	≤ 20%
Chromium	75 - 125	80 - 120	≤ 20%
Cobalt	75 - 125	80 - 120	≤ 20%
Copper	75 - 125	80 - 120	≤ 20%
Iron	75 - 125	80 - 120	≤ 20%
Lead	75 - 125	80 - 120	≤ 20%
Magnesium	75 - 125	80 - 120	≤ 20%
Manganese	75 - 125	80 - 120	≤ 20%
Mercury	75 - 125	80 - 120	≤ 20%
Nickel	75 - 125	80 - 120	≤ 20%
Potassium	75 - 125	80 - 120	≤ 20%
Selenium	75 - 125	80 - 120	≤ 20%
Silica	75 - 125	80 - 120	≤ 20%
Silver	75 - 125	80 - 120	≤ 20%
Sodium	75 - 125	80 - 120	≤ 20%
Strontium	75 - 125	80 - 120	≤ 20%
Thallium	75 - 125	80 - 120	≤ 20%
Vanadium	75 - 125	80 - 120	≤ 20%
Zinc	75 - 125	80 - 120	≤ 20%

TK88 : 00019

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Spike Recovery Control Limits for Conventional Wet Chemistry Effective 5/1/09		
Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. http://www.arilabs.com/portal/downloads/ARI-CLs.zip		
	ARI's Control Limits	
Sample Matrix:	Water	Soil / Sediment
Matrix Spike Recoveries	% Recovery	% Recovery
Ammonia	75 - 125	75 - 125
Bromide	75 125	75 - 125
Chloride	75 125	75 - 125
Cyanide	75 - 125	75 - 125
Ferrous Iron	75 - 125	75 - 125
Fluoride	75 - 125	75 - 125
Formaldehyde	75 - 125	75 - 125
Hexane Extractable Material	-- - --	78 - 114
Hexavalent Chromium	75 - 125	75 - 125
Nitrate/Nitrite	75 - 125	75 - 125
Oil and Grease	75 - 125	75 - 125
Phenol	75 - 125	75 - 125
Phosphorous	75 - 125	75 - 125
Sulfate	75 - 125	75 - 125
Sulfide	75 - 125	75 - 125
Total Kjeldahl Nitrogen	75 - 125	75 - 125
Total Organic Carbon	75 - 125	75 - 125
Duplicate RPDs		
Acidity	±20%	±20%
Alkalinity	±20%	±20%
BOD	±20%	±20%
Cation Exchange	±20%	±20%
COD	±20%	±20%
Conductivity	±20%	±20%
Salinity	±20%	±20%
Solids	±20%	±20%
Turbidity	±20%	±20%

TK88 : 00820

Volatile Analysis
Report and Summary QC Forms

ARI Job ID: TK88, TK89

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: FRP-090211-001**
 SAMPLE

Lab Sample ID: TK88A
LIMS ID: 11-19092
Matrix: Water
Data Release Authorized:
Reported: 09/06/11

QC Report No: TK88-AMEC Geomatrix
Project: FRP 2011 Shoreline Investigation 8769
Date Sampled: 09/02/11
Date Received: 09/02/11

Instrument/Analyst: NT3/PKC
Date Analyzed: 09/05/11 17:19

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	MDL	RL	Result
74-87-3	Chloromethane	0.10	0.5	< 0.5 U
74-83-9	Bromomethane	0.04	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.08	0.2	< 0.2 U
75-00-3	Chloroethane	0.15	0.2	< 0.2 U
75-09-2	Methylene Chloride	0.39	0.5	< 0.5 U
67-64-1	Acetone	0.72	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.09	0.2	< 0.2 U
75-35-4	1,1-Dichloroethene	0.09	0.2	< 0.2 U
75-34-3	1,1-Dichloroethane	0.05	0.2	< 0.2 U
156-60-5	trans-1,2-Dichloroethene	0.08	0.2	< 0.2 U
156-59-2	cis-1,2-Dichloroethene	0.10	0.2	< 0.2 U
67-66-3	Chloroform	0.08	0.2	< 0.2 U
107-06-2	1,2-Dichloroethane	0.08	0.2	< 0.2 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.09	0.2	< 0.2 U
56-23-5	Carbon Tetrachloride	0.08	0.2	< 0.2 U
108-05-4	Vinyl Acetate	0.07	1.0	< 1.0 U
75-27-4	Bromodichloromethane	0.05	0.2	< 0.2 U
78-87-5	1,2-Dichloropropane	0.09	0.2	< 0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.2	< 0.2 U
79-01-6	Trichloroethene	0.08	0.2	< 0.2 U
124-48-1	Dibromochloromethane	0.09	0.2	< 0.2 U
79-00-5	1,1,2-Trichloroethane	0.04	0.2	< 0.2 U
71-43-2	Benzene	0.06	0.2	< 0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.06	0.2	< 0.2 U
110-75-8	2-Chloroethylvinylether	0.09	1.0	< 1.0 U
75-25-2	Bromoform	0.07	0.2	< 0.2 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.38	5.0	< 5.0 U
591-78-6	2-Hexanone	0.31	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.09	0.2	< 0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.07	0.2	< 0.2 U R
108-88-3	**Toluene**	**0.06**	**0.2**	**0.3** U
108-90-7	Chlorobenzene	0.04	0.2	< 0.2 U
100-41-4	**Ethylbenzene**	**0.09**	**0.2**	**0.1 J**
100-42-5	Styrene	0.07	0.2	< 0.2 U
75-69-4	Trichlorofluoromethane	0.09	0.2	< 0.2 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.11	0.2	< 0.2 U
179601-23-1	**m,p-Xylene**	**0.14**	**0.4**	**0.5** J
95-47-6	**o-Xylene**	**0.06**	**0.2**	**0.2** J U
95-50-1	1,2-Dichlorobenzene	0.06	0.2	< 0.2 U
541-73-1	1,3-Dichlorobenzene	0.04	0.2	< 0.2 U
106-46-7	1,4-Dichlorobenzene	0.06	0.2	< 0.2 U
107-02-8	Acrolein	0.29	5.0	< 5.0 UJ
74-88-4	Methyl Iodide	0.04	1.0	< 1.0 U
74-96-4	Bromoethane	0.09	0.2	< 0.2 U
107-13-1	Acrylonitrile	0.18	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.09	0.2	< 0.2 U
74-95-3	Dibromomethane	0.08	0.2	< 0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.07	0.2	< 0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	0.21	0.5	< 0.5 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: FRP-090211-001**
 SAMPLE

Lab Sample ID: TK88A
LIMS ID: 11-19092
Matrix: Water
Date Analyzed: 09/05/11 17:19

QC Report No: TK88-AMEC Geomatrix
Project: FRP 2011 Shoreline Investigation
8769

CAS Number	Analyte	MDL	RL	Result
96-18-4	1,2,3-Trichloropropane	0.23	0.5	< 0.5 U
110-57-6	trans-1,4-Dichloro-2-butene	0.24	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.06	0.2	< 0.2 U
95-63-6	**1,2,4-Trimethylbenzene**	**0.06**	**0.2**	**0.4** U
87-68-3	Hexachlorobutadiene	0.11	0.5	< 0.5 U
106-93-4	Ethylene Dibromide	0.08	0.2	< 0.2 U
74-97-5	Bromochloromethane	0.07	0.2	< 0.2 U
594-20-7	2,2-Dichloropropane	0.08	0.2	< 0.2 U
142-28-9	1,3-Dichloropropane	0.02	0.2	< 0.2 U
98-82-8	Isopropylbenzene	0.06	0.2	< 0.2 U
103-65-1	n-Propylbenzene	0.08	0.2	< 0.2 U
108-86-1	Bromobenzene	0.05	0.2	< 0.2 U
95-49-8	2-Chlorotoluene	0.04	0.2	< 0.2 U
106-43-4	4-Chlorotoluene	0.07	0.2	< 0.2 U
98-06-6	tert-Butylbenzene	0.06	0.2	< 0.2 U
135-98-8	sec-Butylbenzene	0.08	0.2	< 0.2 U
99-87-6	4-Isopropyltoluene	0.08	0.2	< 0.2 U
104-51-8	n-Butylbenzene	0.11	0.2	< 0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	< 0.5 U
91-20-3	**Naphthalene**	**0.07**	**0.5**	~~**0.2 JB**~~ 0.5U
87-61-6	1,2,3-Trichlorobenzene	0.09	0.5	< 0.5 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	100%
d8-Toluene	100%
Bromofluorobenzene	98.1%
d4-1,2-Dichlorobenzene	104%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

09/20/12

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: FRP-090211-002
SAMPLE

Lab Sample ID: TK88B
LIMS ID: 11-19093
Matrix: Water
Data Release Authorized:
Reported: 09/06/11

QC Report No: TK88-AMEC Geomatrix
Project: FRP 2011 Shoreline Investigation
8769
Date Sampled: 09/02/11
Date Received: 09/02/11

Instrument/Analyst: NT3/PKC
Date Analyzed: 09/05/11 17:46

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	MDL	RL	Result
74-87-3	Chloromethane	0.10	0.5	< 0.5 U
74-83-9	Bromomethane	0.04	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.08	0.2	< 0.2 U
75-00-3	Chloroethane	0.15	0.2	< 0.2 U
75-09-2	Methylene Chloride	0.39	0.5	< 0.5 U
67-64-1	**Acetone**	**0.72**	**5.0**	**1.2 J**
75-15-0	**Carbon Disulfide**	**0.09**	**0.2**	**0.2**
75-35-4	1,1-Dichloroethene	0.09	0.2	< 0.2 U
75-34-3	1,1-Dichloroethane	0.05	0.2	< 0.2 U
156-60-5	trans-1,2-Dichloroethene	0.08	0.2	< 0.2 U
156-59-2	cis-1,2-Dichloroethene	0.10	0.2	< 0.2 U
67-66-3	Chloroform	0.08	0.2	< 0.2 U
107-06-2	1,2-Dichloroethane	0.08	0.2	< 0.2 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.09	0.2	< 0.2 U
56-23-5	Carbon Tetrachloride	0.08	0.2	< 0.2 U
108-05-4	Vinyl Acetate	0.07	1.0	< 1.0 U
75-27-4	Bromodichloromethane	0.05	0.2	< 0.2 U
78-87-5	1,2-Dichloropropane	0.09	0.2	< 0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.2	< 0.2 U
79-01-6	Trichloroethene	0.08	0.2	< 0.2 U
124-48-1	Dibromochloromethane	0.09	0.2	< 0.2 U
79-00-5	1,1,2-Trichloroethane	0.04	0.2	< 0.2 U
71-43-2	**Benzene**	**0.06**	**0.2**	**0.7**
10061-02-6	trans-1,3-Dichloropropene	0.06	0.2	< 0.2 U
110-75-8	2-Chloroethylvinylether	0.09	1.0	< 1.0 U
75-25-2	Bromoform	0.07	0.2	< 0.2 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.38	5.0	< 5.0 U
591-78-6	2-Hexanone	0.31	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.09	0.2	< 0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.07	0.2	< 0.2 U R
108-88-3	**Toluene**	**0.06**	**0.2**	**1.8** J
108-90-7	Chlorobenzene	0.04	0.2	< 0.2 U
100-41-4	**Ethylbenzene**	**0.09**	**0.2**	**0.4**
100-42-5	Styrene	0.07	0.2	< 0.2 U
75-69-4	Trichlorofluoromethane	0.09	0.2	< 0.2 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.11	0.2	< 0.2 U
179601-23-1	**m,p-Xylene**	**0.14**	**0.4**	**1.8** J
95-47-6	**o-Xylene**	**0.06**	**0.2**	**0.9** J
95-50-1	1,2-Dichlorobenzene	0.06	0.2	< 0.2 U
541-73-1	1,3-Dichlorobenzene	0.04	0.2	< 0.2 U
106-46-7	1,4-Dichlorobenzene	0.06	0.2	< 0.2 U
107-02-8	Acrolein	0.29	5.0	< 5.0 U J
74-88-4	Methyl Iodide	0.04	1.0	< 1.0 U
74-96-4	Bromoethane	0.09	0.2	< 0.2 U
107-13-1	Acrylonitrile	0.18	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.09	0.2	< 0.2 U
74-95-3	Dibromomethane	0.08	0.2	< 0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.07	0.2	< 0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	0.21	0.5	< 0.5 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: FRP-090211-002
SAMPLE

Lab Sample ID: TK88B
LIMS ID: 11-19093
Matrix: Water
Date Analyzed: 09/05/11 17:46

QC Report No: TK88-AMEC Geomatrix
Project: FRP 2011 Shoreline Investigation
8769

CAS Number	Analyte	MDL	RL	Result
96-18-4	1,2,3-Trichloropropane	0.23	0.5	< 0.5 U
110-57-6	trans-1,4-Dichloro-2-butene	0.24	1.0	< 1.0 U
108-67-8	**1,3,5-Trimethylbenzene**	**0.06**	**0.2**	**0.2 J**
95-63-6	**1,2,4-Trimethylbenzene**	**0.06**	**0.2**	**0.9** ~~J~~
87-68-3	Hexachlorobutadiene	0.11	0.5	< 0.5 U
106-93-4	Ethylene Dibromide	0.08	0.2	< 0.2 U
74-97-5	Bromochloromethane	0.07	0.2	< 0.2 U
594-20-7	2,2-Dichloropropane	0.08	0.2	< 0.2 U
142-28-9	1,3-Dichloropropane	0.02	0.2	< 0.2 U
98-82-8	Isopropylbenzene	0.06	0.2	< 0.2 U
103-65-1	n-Propylbenzene	0.08	0.2	< 0.2 U
108-86-1	Bromobenzene	0.05	0.2	< 0.2 U
95-49-8	2-Chlorotoluene	0.04	0.2	< 0.2 U
106-43-4	4-Chlorotoluene	0.07	0.2	< 0.2 U
98-06-6	tert-Butylbenzene	0.06	0.2	< 0.2 U
135-98-8	sec-Butylbenzene	0.08	0.2	< 0.2 U
99-87-6	4-Isopropyltoluene	0.08	0.2	< 0.2 U
104-51-8	n-Butylbenzene	0.11	0.2	< 0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	< 0.5 U
91-20-3	**Naphthalene**	**0.07**	**0.5**	~~**0.4 JB**~~ 0.5U
87-61-6	1,2,3-Trichlorobenzene	0.09	0.5	< 0.5 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	107%
d8-Toluene	102%
Bromofluorobenzene	99.8%
d4-1,2-Dichlorobenzene	103%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: FRP-090211-003**
 SAMPLE

Lab Sample ID: TK88C
LIMS ID: 11-19094
Matrix: Water
Data Release Authorized:
Reported: 09/06/11

QC Report No: TK88-AMEC Geomatrix
Project: FRP 2011 Shoreline Investigation 8769
Date Sampled: 09/02/11
Date Received: 09/02/11

Instrument/Analyst: NT3/PKC
Date Analyzed: 09/05/11 18:13

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	MDL	RL	Result
74-87-3	Chloromethane	0.10	0.5	< 0.5 U
74-83-9	Bromomethane	0.04	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.08	0.2	< 0.2 U
75-00-3	Chloroethane	0.15	0.2	< 0.2 U
75-09-2	**Methylene Chloride**	**0.39**	**0.5**	**1.0 ~~B~~ U**
67-64-1	Acetone	0.72	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.09	0.2	< 0.2 U
75-35-4	1,1-Dichloroethene	0.09	0.2	< 0.2 U
75-34-3	1,1-Dichloroethane	0.05	0.2	< 0.2 U
156-60-5	trans-1,2-Dichloroethene	0.08	0.2	< 0.2 U
156-59-2	cis-1,2-Dichloroethene	0.10	0.2	< 0.2 U
67-66-3	**Chloroform**	**0.08**	**0.2**	**1.6**
107-06-2	1,2-Dichloroethane	0.08	0.2	< 0.2 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.09	0.2	< 0.2 U
56-23-5	Carbon Tetrachloride	0.08	0.2	< 0.2 U
108-05-4	Vinyl Acetate	0.07	1.0	< 1.0 U
75-27-4	Bromodichloromethane	0.05	0.2	< 0.2 U
78-87-5	1,2-Dichloropropane	0.09	0.2	< 0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.2	< 0.2 U
79-01-6	Trichloroethene	0.08	0.2	< 0.2 U
124-48-1	Dibromochloromethane	0.09	0.2	< 0.2 U
79-00-5	1,1,2-Trichloroethane	0.04	0.2	< 0.2 U
71-43-2	Benzene	0.06	0.2	< 0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.06	0.2	< 0.2 U
110-75-8	2-Chloroethylvinylether	0.09	1.0	< 1.0 U
75-25-2	Bromoform	0.07	0.2	< 0.2 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.38	5.0	< 5.0 U
591-78-6	2-Hexanone	0.31	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.09	0.2	< 0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.07	0.2	< 0.2 U R
108-88-3	**Toluene**	**0.06**	**0.2**	**0.4**
108-90-7	Chlorobenzene	0.04	0.2	< 0.2 U
100-41-4	Ethylbenzene	0.09	0.2	< 0.2 U
100-42-5	Styrene	0.07	0.2	< 0.2 U
75-69-4	Trichlorofluoromethane	0.09	0.2	< 0.2 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.11	0.2	< 0.2 U
179601-23-1	**m,p-Xylene**	**0.14**	**0.4**	**0.4**
95-47-6	**o-Xylene**	**0.06**	**0.2**	**0.2**
95-50-1	1,2-Dichlorobenzene	0.06	0.2	< 0.2 U
541-73-1	1,3-Dichlorobenzene	0.04	0.2	< 0.2 U
106-46-7	1,4-Dichlorobenzene	0.06	0.2	< 0.2 U
107-02-8	Acrolein	0.29	5.0	< 5.0 U J
74-88-4	Methyl Iodide	0.04	1.0	< 1.0 U
74-96-4	Bromoethane	0.09	0.2	< 0.2 U
107-13-1	Acrylonitrile	0.18	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.09	0.2	< 0.2 U
74-95-3	Dibromomethane	0.08	0.2	< 0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.07	0.2	< 0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	0.21	0.5	< 0.5 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: FRP-090211-003**
 SAMPLE

Lab Sample ID: TK88C
LIMS ID: 11-19094
Matrix: Water
Date Analyzed: 09/05/11 18:13

QC Report No: TK88-AMEC Geomatrix
Project: FRP 2011 Shoreline Investigation
8769

CAS Number	Analyte	MDL	RL	Result
96-18-4	1,2,3-Trichloropropane	0.23	0.5	< 0.5 U
110-57-6	trans-1,4-Dichloro-2-butene	0.24	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.06	0.2	< 0.2 U
95-63-6	**1,2,4-Trimethylbenzene**	**0.06**	**0.2**	**0.3**
87-68-3	Hexachlorobutadiene	0.11	0.5	< 0.5 U
106-93-4	Ethylene Dibromide	0.08	0.2	< 0.2 U
74-97-5	Bromochloromethane	0.07	0.2	< 0.2 U
594-20-7	2,2-Dichloropropane	0.08	0.2	< 0.2 U
142-28-9	1,3-Dichloropropane	0.02	0.2	< 0.2 U
98-82-8	Isopropylbenzene	0.06	0.2	< 0.2 U
103-65-1	n-Propylbenzene	0.08	0.2	< 0.2 U
108-86-1	Bromobenzene	0.05	0.2	< 0.2 U
95-49-8	2-Chlorotoluene	0.04	0.2	< 0.2 U
106-43-4	4-Chlorotoluene	0.07	0.2	< 0.2 U
98-06-6	tert-Butylbenzene	0.06	0.2	< 0.2 U
135-98-8	sec-Butylbenzene	0.08	0.2	< 0.2 U
99-87-6	4-Isopropyltoluene	0.08	0.2	< 0.2 U
104-51-8	n-Butylbenzene	0.11	0.2	< 0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	< 0.5 U
91-20-3	**Naphthalene**	**0.07**	**0.5**	~~**0.1 JB**~~ 0.5 U
87-61-6	1,2,3-Trichlorobenzene	0.09	0.5	< 0.5 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	103%
d8-Toluene	99.8%
Bromofluorobenzene	97.7%
d4-1,2-Dichlorobenzene	101%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: Trip Blank**
 SAMPLE

Lab Sample ID: TK88D
LIMS ID: 11-19095
Matrix: Water
Data Release Authorized:
Reported: 09/06/11

QC Report No: TK88-AMEC Geomatrix
Project: FRP 2011 Shoreline Investigation 8769
Date Sampled: 09/02/11
Date Received: 09/02/11

Instrument/Analyst: NT3/PKC
Date Analyzed: 09/05/11 11:46

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	MDL	RL	Result
74-87-3	Chloromethane	0.10	0.5	< 0.5 U
74-83-9	Bromomethane	0.04	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.08	0.2	< 0.2 U
75-00-3	Chloroethane	0.15	0.2	< 0.2 U
75-09-2	**Methylene Chloride**	**0.39**	**0.5**	**0.7 B**
67-64-1	Acetone	0.72	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.09	0.2	< 0.2 U
75-35-4	1,1-Dichloroethene	0.09	0.2	< 0.2 U
75-34-3	1,1-Dichloroethane	0.05	0.2	< 0.2 U
156-60-5	trans-1,2-Dichloroethene	0.08	0.2	< 0.2 U
156-59-2	cis-1,2-Dichloroethene	0.10	0.2	< 0.2 U
67-66-3	Chloroform	0.08	0.2	< 0.2 U
107-06-2	1,2-Dichloroethane	0.08	0.2	< 0.2 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.09	0.2	< 0.2 U
56-23-5	Carbon Tetrachloride	0.08	0.2	< 0.2 U
108-05-4	Vinyl Acetate	0.07	1.0	< 1.0 U
75-27-4	Bromodichloromethane	0.05	0.2	< 0.2 U
78-87-5	1,2-Dichloropropane	0.09	0.2	< 0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.2	< 0.2 U
79-01-6	Trichloroethene	0.08	0.2	< 0.2 U
124-48-1	Dibromochloromethane	0.09	0.2	< 0.2 U
79-00-5	1,1,2-Trichloroethane	0.04	0.2	< 0.2 U
71-43-2	Benzene	0.06	0.2	< 0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.06	0.2	< 0.2 U
110-75-8	2-Chloroethylvinylether	0.09	1.0	< 1.0 U
75-25-2	Bromoform	0.07	0.2	< 0.2 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.38	5.0	< 5.0 U
591-78-6	2-Hexanone	0.31	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.09	0.2	< 0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.07	0.2	< 0.2 U
108-88-3	Toluene	0.06	0.2	< 0.2 U
108-90-7	Chlorobenzene	0.04	0.2	< 0.2 U
100-41-4	Ethylbenzene	0.09	0.2	< 0.2 U
100-42-5	**Styrene**	**0.07**	**0.2**	**0.1 J**
75-69-4	Trichlorofluoromethane	0.09	0.2	< 0.2 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.11	0.2	< 0.2 U
179601-23-1	m,p-Xylene	0.14	0.4	< 0.4 U
95-47-6	o-Xylene	0.06	0.2	< 0.2 U
95-50-1	1,2-Dichlorobenzene	0.06	0.2	< 0.2 U
541-73-1	1,3-Dichlorobenzene	0.04	0.2	< 0.2 U
106-46-7	1,4-Dichlorobenzene	0.06	0.2	< 0.2 U
107-02-8	Acrolein	0.29	5.0	< 5.0 U
74-88-4	Methyl Iodide	0.04	1.0	< 1.0 U
74-96-4	Bromoethane	0.09	0.2	< 0.2 U
107-13-1	Acrylonitrile	0.18	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.09	0.2	< 0.2 U
74-95-3	Dibromomethane	0.08	0.2	< 0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.07	0.2	< 0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	0.21	0.5	< 0.5 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: Trip Blank**
 SAMPLE

Lab Sample ID: TK88D
LIMS ID: 11-19095
Matrix: Water
Date Analyzed: 09/05/11 11:46

QC Report No: TK88-AMEC Geomatrix
Project: FRP 2011 Shoreline Investigation
8769

CAS Number	Analyte	MDL	RL	Result
96-18-4	1,2,3-Trichloropropane	0.23	0.5	< 0.5 U
110-57-6	trans-1,4-Dichloro-2-butene	0.24	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.06	0.2	< 0.2 U
95-63-6	1,2,4-Trimethylbenzene	0.06	0.2	< 0.2 U
87-68-3	Hexachlorobutadiene	0.11	0.5	< 0.5 U
106-93-4	Ethylene Dibromide	0.08	0.2	< 0.2 U
74-97-5	Bromochloromethane	0.07	0.2	< 0.2 U
594-20-7	2,2-Dichloropropane	0.08	0.2	< 0.2 U
142-28-9	1,3-Dichloropropane	0.02	0.2	< 0.2 U
98-82-8	Isopropylbenzene	0.06	0.2	< 0.2 U
103-65-1	n-Propylbenzene	0.08	0.2	< 0.2 U
108-86-1	Bromobenzene	0.05	0.2	< 0.2 U
95-49-8	2-Chlorotoluene	0.04	0.2	< 0.2 U
106-43-4	4-Chlorotoluene	0.07	0.2	< 0.2 U
98-06-6	tert-Butylbenzene	0.06	0.2	< 0.2 U
135-98-8	sec-Butylbenzene	0.08	0.2	< 0.2 U
99-87-6	4-Isopropyltoluene	0.08	0.2	< 0.2 U
104-51-8	n-Butylbenzene	0.11	0.2	< 0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	< 0.5 U
91-20-3	Naphthalene	0.07	0.5	< 0.5 U
87-61-6	1,2,3-Trichlorobenzene	0.09	0.5	< 0.5 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%
d8-Toluene	102%
Bromofluorobenzene	101%
d4-1,2-Dichlorobenzene	103%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

ANALYTICAL RESOURCES INCORPORATED

VOA SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: TK88-AMEC Geomatrix
Project: FRP 2011 Shoreline Investigation
8769

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
MB-090511	Method Blank	10	102%	100%	99.9%	103%	0
LCS-090511	Lab Control	10	99.7%	99.5%	103%	104%	0
LCSD-090511	Lab Control Dup	10	98.3%	99.9%	101%	102%	0
TK88A	FRP-090211-001	10	100%	100%	98.1%	104%	0
TK88B	FRP-090211-002	10	107%	102%	99.8%	103%	0
TK88C	FRP-090211-003	10	103%	99.8%	97.7%	101%	0
TK88D	Trip Blank	10	102%	102%	101%	103%	0

SW8260C	LCS/MB LIMITS	QC LIMITS
(DCE) = d4-1,2-Dichloroethane	80-120	80-120
(TOL) = d8-Toluene	80-120	80-120
(BFB) = Bromofluorobenzene	80-120	80-120
(DCB) = d4-1,2-Dichlorobenzene	80-120	80-120

Prep Method: SW5030B
Log Number Range: 11-19092 to 11-19095

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LCS-090511**

LAB CONTROL SAMPLE

Lab Sample ID: LCS-090511
LIMS ID: 11-19092
Matrix: Water
Data Release Authorized:
Reported: 09/06/11

QC Report No: TK88-AMEC Geomatrix
Project: FRP 2011 Shoreline Investigation
8769
Date Sampled: NA
Date Received: NA

Instrument/Analyst LCS: NT3/PKC
LCSD: NT3/PKC
Date Analyzed LCS: 09/05/11 09:54
LCSD: 09/05/11 10:21

Sample Amount LCS: 10.0 mL
LCSD: 10.0 mL
Purge Volume LCS: 10.0 mL
LCSD: 10.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Chloromethane	9.7	10.0	97.0%	9.5	10.0	95.0%	2.1%
Bromomethane	9.8	10.0	98.0%	9.6	10.0	96.0%	2.1%
Vinyl Chloride	9.4	10.0	94.0%	9.5	10.0	95.0%	1.1%
Chloroethane	9.5	10.0	95.0%	9.4	10.0	94.0%	1.1%
Methylene Chloride	10.0 B	10.0	100%	9.6 B	10.0	96.0%	4.1%
Acetone	48.4	50.0	96.8%	47.1	50.0	94.2%	2.7%
Carbon Disulfide	9.5	10.0	95.0%	9.5	10.0	95.0%	0.0%
1,1-Dichloroethene	9.3	10.0	93.0%	9.3	10.0	93.0%	0.0%
1,1-Dichloroethane	9.4	10.0	94.0%	9.4	10.0	94.0%	0.0%
trans-1,2-Dichloroethene	9.3	10.0	93.0%	9.2	10.0	92.0%	1.1%
cis-1,2-Dichloroethene	9.2	10.0	92.0%	9.2	10.0	92.0%	0.0%
Chloroform	9.5	10.0	95.0%	9.4	10.0	94.0%	1.1%
1,2-Dichloroethane	9.1	10.0	91.0%	9.4	10.0	94.0%	3.2%
2-Butanone	45.8	50.0	91.6%	47.8	50.0	95.6%	4.3%
1,1,1-Trichloroethane	9.5	10.0	95.0%	9.4	10.0	94.0%	1.1%
Carbon Tetrachloride	9.6	10.0	96.0%	9.8	10.0	98.0%	2.1%
Vinyl Acetate	9.2	10.0	92.0%	9.2	10.0	92.0%	0.0%
Bromodichloromethane	9.9	10.0	99.0%	9.5	10.0	95.0%	4.1%
1,2-Dichloropropane	9.8	10.0	98.0%	9.8	10.0	98.0%	0.0%
cis-1,3-Dichloropropene	9.8	10.0	98.0%	9.9	10.0	99.0%	1.0%
Trichloroethene	9.1	10.0	91.0%	9.3	10.0	93.0%	2.2%
Dibromochloromethane	10.4	10.0	104%	10.2	10.0	102%	1.9%
1,1,2-Trichloroethane	9.4	10.0	94.0%	9.6	10.0	96.0%	2.1%
Benzene	9.7	10.0	97.0%	9.7	10.0	97.0%	0.0%
trans-1,3-Dichloropropene	10.0	10.0	100%	10.1	10.0	101%	1.0%
2-Chloroethylvinylether	10.0	10.0	100%	10.3	10.0	103%	3.0%
Bromoform	10.4	10.0	104%	10.5	10.0	105%	1.0%
4-Methyl-2-Pentanone (MIBK)	49.2	50.0	98.4%	49.9	50.0	99.8%	1.4%
2-Hexanone	50.2	50.0	100%	49.3	50.0	98.6%	1.8%
Tetrachloroethene	9.6	10.0	96.0%	9.2	10.0	92.0%	4.3%
1,1,2,2-Tetrachloroethane	9.6	10.0	96.0%	9.5	10.0	95.0%	1.0%
Toluene	9.6	10.0	96.0%	9.6	10.0	96.0%	0.0%
Chlorobenzene	9.8	10.0	98.0%	9.7	10.0	97.0%	1.0%
Ethylbenzene	10.0	10.0	100%	9.8	10.0	98.0%	2.0%
Styrene	9.9	10.0	99.0%	9.8	10.0	98.0%	1.0%
Trichlorofluoromethane	9.7	10.0	97.0%	9.4	10.0	94.0%	3.1%
1,1,2-Trichloro-1,2,2-trifluoroetha	9.5	10.0	95.0%	9.4	10.0	94.0%	1.1%
m,p-Xylene	19.9	20.0	99.5%	19.4	20.0	97.0%	2.5%
o-Xylene	9.9	10.0	99.0%	9.7	10.0	97.0%	2.0%
1,2-Dichlorobenzene	9.6	10.0	96.0%	9.4	10.0	94.0%	2.1%
1,3-Dichlorobenzene	9.6	10.0	96.0%	9.6	10.0	96.0%	0.0%
1,4-Dichlorobenzene	9.5	10.0	95.0%	9.5	10.0	95.0%	0.0%
Acrolein	41.3 Q	50.0	82.6%	40.4 Q	50.0	80.8%	2.2%
Methyl Iodide	9.5	10.0	95.0%	9.3	10.0	93.0%	2.1%
Bromoethane	9.6	10.0	96.0%	9.4	10.0	94.0%	2.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LCS-090511**

LAB CONTROL SAMPLE

Lab Sample ID: LCS-090511
LIMS ID: 11-19092
Matrix: Water

QC Report No: TK88-AMEC Geomatrix
Project: FRP 2011 Shoreline Investigation
8769

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Acrylonitrile	10.0	10.0	100%	9.2	10.0	92.0%	8.3%
1,1-Dichloropropene	9.6	10.0	96.0%	9.6	10.0	96.0%	0.0%
Dibromomethane	9.4	10.0	94.0%	9.4	10.0	94.0%	0.0%
1,1,1,2-Tetrachloroethane	9.8	10.0	98.0%	9.5	10.0	95.0%	3.1%
1,2-Dibromo-3-chloropropane	9.7	10.0	97.0%	10.1	10.0	101%	4.0%
1,2,3-Trichloropropane	9.7	10.0	97.0%	9.4	10.0	94.0%	3.1%
trans-1,4-Dichloro-2-butene	10.0	10.0	100%	9.6	10.0	96.0%	4.1%
1,3,5-Trimethylbenzene	10.2	10.0	102%	9.9	10.0	99.0%	3.0%
1,2,4-Trimethylbenzene	10.1	10.0	101%	9.9	10.0	99.0%	2.0%
Hexachlorobutadiene	10.2	10.0	102%	10.0	10.0	100%	2.0%
Ethylene Dibromide	9.6	10.0	96.0%	10.0	10.0	100%	4.1%
Bromochloromethane	9.3	10.0	93.0%	9.6	10.0	96.0%	3.2%
2,2-Dichloropropane	9.7	10.0	97.0%	9.6	10.0	96.0%	1.0%
1,3-Dichloropropane	9.7	10.0	97.0%	9.9	10.0	99.0%	2.0%
Isopropylbenzene	10.0	10.0	100%	9.8	10.0	98.0%	2.0%
n-Propylbenzene	10.3	10.0	103%	10.0	10.0	100%	3.0%
Bromobenzene	9.8	10.0	98.0%	9.8	10.0	98.0%	0.0%
2-Chlorotoluene	9.9	10.0	99.0%	9.8	10.0	98.0%	1.0%
4-Chlorotoluene	10.0	10.0	100%	9.9	10.0	99.0%	1.0%
tert-Butylbenzene	10.0	10.0	100%	9.7	10.0	97.0%	3.0%
sec-Butylbenzene	10.2	10.0	102%	10.0	10.0	100%	2.0%
4-Isopropyltoluene	10.2	10.0	102%	10.0	10.0	100%	2.0%
n-Butylbenzene	10.5	10.0	105%	10.1	10.0	101%	3.9%
1,2,4-Trichlorobenzene	10.1	10.0	101%	10.1	10.0	101%	0.0%
Naphthalene	10.3 B	10.0	103%	10.2 B	10.0	102%	1.0%
1,2,3-Trichlorobenzene	10.1	10.0	101%	10.0	10.0	100%	1.0%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	99.7%	98.3%
d8-Toluene	99.5%	99.9%
Bromofluorobenzene	103%	101%
d4-1,2-Dichlorobenzene	104%	102%

4A
VOLATILE METHOD BLANK SUMMARY

Method Blank ID.

MB0905

Lab Name: ANALYTICAL RESOURCES INC

Client: GEOMATRIX, INC.

ARI Job No: TK70

Project: FRP 2011 SHORELINE INVE

Lab File ID: MB0905

Lab Sample ID: MB0905

Date Analyzed: 09/05/11

Time Analyzed: 1048

Instrument ID: NT3

Heated Purge: (Y/N) N

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	LCS0905	LCS0905	LCS0905	0954
02	LCS0905	LCS0905	LCS0905A	1021
03	TRIP BLANKS	TK70I	TK70I	1119
04	TRIP BLANK	TK88D	TK88D	1146
05	FRP-090111-0	TK70A	TK70A	1346
06	FRP-090111-0	TK70B	TK70B	1413
07	FRP-090111-0	TK70C	TK70C	1440
08	FRP-090111-0	TK70D	TK70D	1507
09	FRP-090111-0	TK70E	TK70E	1533
10	FRP-090111-0	TK70F	TK70F	1559
11	FRP-090111-0	TK70G	TK70G	1626
12	FRP-090111-0	TK70H	TK70H	1653
13	FRP-090211-0	TK88A	TK88A	1719
14	FRP-090211-0	TK88B	TK88B	1746
15	FRP-090211-0	TK88C	TK88C	1813
16	FRP-090111-0	TK70A	TK70AMS	2026
17	FRP-090111-0	TK70A	TK70AMSD	2052
18				
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COMMENTS:

FORM IV VOA

OLM3.2M

TK88:00033

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MB-090511**

METHOD BLANK

Lab Sample ID: MB-090511
LIMS ID: 11-19092
Matrix: Water
Data Release Authorized:
Reported: 09/06/11

QC Report No: TK88-AMEC Geomatrix
Project: FRP 2011 Shoreline Investigation 8769
Date Sampled: NA
Date Received: NA

Instrument/Analyst: NT3/PKC
Date Analyzed: 09/05/11 10:48

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	MDL	RL	Result
74-87-3	Chloromethane	0.10	0.5	< 0.5 U
74-83-9	Bromomethane	0.04	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.08	0.2	< 0.2 U
75-00-3	Chloroethane	0.15	0.2	< 0.2 U
75-09-2	**Methylene Chloride**	**0.39**	**0.5**	**0.5 J**
67-64-1	Acetone	0.72	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.09	0.2	< 0.2 U
75-35-4	1,1-Dichloroethene	0.09	0.2	< 0.2 U
75-34-3	1,1-Dichloroethane	0.05	0.2	< 0.2 U
156-60-5	trans-1,2-Dichloroethene	0.08	0.2	< 0.2 U
156-59-2	cis-1,2-Dichloroethene	0.10	0.2	< 0.2 U
67-66-3	Chloroform	0.08	0.2	< 0.2 U
107-06-2	1,2-Dichloroethane	0.08	0.2	< 0.2 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.09	0.2	< 0.2 U
56-23-5	Carbon Tetrachloride	0.08	0.2	< 0.2 U
108-05-4	Vinyl Acetate	0.07	1.0	< 1.0 U
75-27-4	Bromodichloromethane	0.05	0.2	< 0.2 U
78-87-5	1,2-Dichloropropane	0.09	0.2	< 0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.2	< 0.2 U
79-01-6	Trichloroethene	0.08	0.2	< 0.2 U
124-48-1	Dibromochloromethane	0.09	0.2	< 0.2 U
79-00-5	1,1,2-Trichloroethane	0.04	0.2	< 0.2 U
71-43-2	Benzene	0.06	0.2	< 0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.06	0.2	< 0.2 U
110-75-8	2-Chloroethylvinylether	0.09	1.0	< 1.0 U
75-25-2	Bromoform	0.07	0.2	< 0.2 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.38	5.0	< 5.0 U
591-78-6	2-Hexanone	0.31	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.09	0.2	< 0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.07	0.2	< 0.2 U
108-88-3	Toluene	0.06	0.2	< 0.2 U
108-90-7	Chlorobenzene	0.04	0.2	< 0.2 U
100-41-4	Ethylbenzene	0.09	0.2	< 0.2 U
100-42-5	Styrene	0.07	0.2	< 0.2 U
75-69-4	Trichlorofluoromethane	0.09	0.2	< 0.2 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.11	0.2	< 0.2 U
179601-23-1	m,p-Xylene	0.14	0.4	< 0.4 U
95-47-6	o-Xylene	0.06	0.2	< 0.2 U
95-50-1	1,2-Dichlorobenzene	0.06	0.2	< 0.2 U
541-73-1	1,3-Dichlorobenzene	0.04	0.2	< 0.2 U
106-46-7	1,4-Dichlorobenzene	0.06	0.2	< 0.2 U
107-02-8	Acrolein	0.29	5.0	< 5.0 U
74-88-4	Methyl Iodide	0.04	1.0	< 1.0 U
74-96-4	Bromoethane	0.09	0.2	< 0.2 U
107-13-1	Acrylonitrile	0.18	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.09	0.2	< 0.2 U
74-95-3	Dibromomethane	0.08	0.2	< 0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.07	0.2	< 0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	0.21	0.5	< 0.5 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MB-090511**

METHOD BLANK

Lab Sample ID: MB-090511
LIMS ID: 11-19092
Matrix: Water
Date Analyzed: 09/05/11 10:48

QC Report No: TK88-AMEC Geomatrix
Project: FRP 2011 Shoreline Investigation
8769

CAS Number	Analyte	MDL	RL	Result
96-18-4	1,2,3-Trichloropropane	0.23	0.5	< 0.5 U
110-57-6	trans-1,4-Dichloro-2-butene	0.24	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.06	0.2	< 0.2 U
95-63-6	1,2,4-Trimethylbenzene	0.06	0.2	< 0.2 U
87-68-3	Hexachlorobutadiene	0.11	0.5	< 0.5 U
106-93-4	Ethylene Dibromide	0.08	0.2	< 0.2 U
74-97-5	Bromochloromethane	0.07	0.2	< 0.2 U
594-20-7	2,2-Dichloropropane	0.08	0.2	< 0.2 U
142-28-9	1,3-Dichloropropane	0.02	0.2	< 0.2 U
98-82-8	Isopropylbenzene	0.06	0.2	< 0.2 U
103-65-1	n-Propylbenzene	0.08	0.2	< 0.2 U
108-86-1	Bromobenzene	0.05	0.2	< 0.2 U
95-49-8	2-Chlorotoluene	0.04	0.2	< 0.2 U
106-43-4	4-Chlorotoluene	0.07	0.2	< 0.2 U
98-06-6	tert-Butylbenzene	0.06	0.2	< 0.2 U
135-98-8	sec-Butylbenzene	0.08	0.2	< 0.2 U
99-87-6	4-Isopropyltoluene	0.08	0.2	< 0.2 U
104-51-8	n-Butylbenzene	0.11	0.2	< 0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	< 0.5 U
91-20-3	**Naphthalene**	**0.07**	**0.5**	**0.3 J**
87-61-6	1,2,3-Trichlorobenzene	0.09	0.5	< 0.5 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%
d8-Toluene	100%
Bromofluorobenzene	99.9%
d4-1,2-Dichlorobenzene	103%

5A
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ANALYTICAL RESOURCES INC Contract: GEOMATRIX, INC.

Lab Code: ARI Case No.: FRP 2011 SHORELINE INVESTIGATION SDG No.: TK70

Lab File ID: BFB0901 BFB Injection Date: 09/01/11

Instrument ID: NT3 BFB Injection Time: 1058

GC Column: RTXVMS ID: 0.18 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	16.3
75	30.0 - 66.0% of mass 95	48.7
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.2
173	Less than 2.0% of mass 174	0.3 (0.4)1
174	50.0 - 101.0% of mass 95	76.7
175	4.0 - 9.0% of mass 174	5.5 (7.1)1
176	93.0 - 101.0% of mass 174	74.2 (96.7)1
177	5.0 - 9.0% of mass 176	4.9 (6.7)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD0.2	VSTD0.2	00_20901	09/01/11	1147
02	VSTD0.5	VSTD0.5	00_50901	09/01/11	1214
03	VSTD01	VSTD01	01_00901	09/01/11	1241
04	VSTD02	VSTD02	02_00901	09/01/11	1308
05	VSTD10	VSTD10	10_00901	09/01/11	1334
06	VSTD20	VSTD20	20_00901	09/01/11	1402
07	VSTD40	VSTD40	40_00901	09/01/11	1428
08	VSTD80	VSTD80	80_00901	09/01/11	1455
09	ICV10	ICV10	ICV0901	09/01/11	1548
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM V VOA OLM3.2M

TK88:00035

5A
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ANALYTICAL RESOURCES INC Contract: GEOMATRIX, INC.

Lab Code: ARI Case No.: FRP 2011 SHORELINE INVESTIGATION SDG No.: TK70

Lab File ID: BFB0905 BFB Injection Date: 09/05/11

Instrument ID: NT3 BFB Injection Time: 0854

GC Column: RTXVMS ID: 0.18 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	14.6
75	30.0 - 66.0% of mass 95	48.8
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.1
173	Less than 2.0% of mass 174	0.5 (0.6)1
174	50.0 - 101.0% of mass 95	77.1
175	4.0 - 9.0% of mass 174	5.6 (7.3)1
176	93.0 - 101.0% of mass 174	74.3 (96.3)1
177	5.0 - 9.0% of mass 176	4.3 (5.7)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	CC0905	CC0905	CC0905	09/05/11	0927
02	LCS0905	LCS0905	LCS0905	09/05/11	0954
03	LCS0905	LCS0905	LCS0905A	09/05/11	1021
04	MB0905	MB0905	MB0905	09/05/11	1048
05	TRIP BLANKS	TK70I	TK70I	09/05/11	1119
06	TRIP BLANK	TK88D	TK88D	09/05/11	1146
07	FRP-090111-001	TK70A	TK70A	09/05/11	1346
08	FRP-090111-002	TK70B	TK70B	09/05/11	1413
09	FRP-090111-003	TK70C	TK70C	09/05/11	1440
10	FRP-090111-004	TK70D	TK70D	09/05/11	1507
11	FRP-090111-005	TK70E	TK70E	09/05/11	1533
12	FRP-090111-006	TK70F	TK70F	09/05/11	1559
13	FRP-090111-007	TK70G	TK70G	09/05/11	1626
14	FRP-090111-008	TK70H	TK70H	09/05/11	1653
15	FRP-090211-001	TK88A	TK88A	09/05/11	1719
16	FRP-090211-002	TK88B	TK88B	09/05/11	1746
17	FRP-090211-003	TK88C	TK88C	09/05/11	1813
18	FRP-090111-001	TK70A	TK70AMS	09/05/11	2026
19	FRP-090111-001	TK70A	TK70AMSD	09/05/11	2052
20					
21					
22					

FORM V VOA OLM3.2M

TK88:00037

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOMATRIX, INC.

ARI Job No: TK70 Project: FRP 2011 SHORELINE INVESTIG

Instrument ID: NT3 Calibration Date: 09/01/11

LAB FILE ID: RF0.2: 00_20901 RF0.5: 00_50901 RF1: 01_00901
RF2: 02_00901 RF10: 10_00901

COMPOUND	RF0.2	RF0.5	RF1	RF2	RF10
Chloromethane	0.531	0.556	0.498	0.490	0.489
Vinyl Chloride	0.652	0.660	0.641	0.595	0.596
Bromomethane		0.375	0.409	0.351	0.381
Chloroethane	0.444	0.412	0.401	0.368	0.370
Trichlorofluoromethane	0.870	0.860	0.849	0.829	0.828
Acrolein		0.025	0.028	0.025	0.026
112Trichloro122Trifluoroetha	0.745	0.629	0.583	0.568	0.573
Acetone		0.042	0.039	0.035	0.037
1,1-Dichloroethene	0.553	0.517	0.524	0.474	0.486
Bromoethane	0.406	0.461	0.396	0.400	0.423
Iodomethane		0.902	0.907	0.823	0.870
Methylene Chloride		0.882	0.683	0.546	0.478
Acrylonitrile			0.030	0.050	0.048
Carbon Disulfide	2.027	1.704	1.684	1.574	1.647
Trans-1,2-Dichloroethene	0.640	0.576	0.566	0.546	0.553
Vinyl Acetate			0.281	0.259	0.282
1,1-Dichloroethane	0.940	0.837	0.872	0.823	0.846
2-Butanone		0.051	0.059	0.052	0.055
2,2-Dichloropropane	0.900	0.794	0.826	0.754	0.760
Cis-1,2-Dichloroethene	0.614	0.563	0.543	0.530	0.531
Chloroform	0.814	0.900	0.873	0.843	0.860
Bromochloromethane	0.194	0.191	0.207	0.190	0.208
1,1,1-Trichloroethane	0.977	0.932	0.909	0.856	0.912
1,1-Dichloropropene	0.480	0.475	0.450	0.422	0.451
Carbon Tetrachloride	0.497	0.497	0.462	0.445	0.486
1,2-Dichloroethane	0.276	0.280	0.282	0.265	0.256
Benzene	1.241	1.298	1.268	1.244	1.249
Trichloroethene	0.420	0.372	0.378	0.370	0.367
1,2-Dichloropropane	0.225	0.274	0.249	0.244	0.251
Bromodichloromethane	0.333	0.316	0.333	0.310	0.317
Dibromomethane	0.101	0.116	0.112	0.116	0.105
2-Chloroethyl Vinyl Ether		0.076	0.079	0.068	0.082
4-Methyl-2-Pentanone		0.094	0.090	0.095	0.099
Cis 1,3-dichloropropene	0.348	0.355	0.359	0.338	0.362
Toluene	0.935	0.850	0.873	0.870	0.844
Trans 1,3-Dichloropropene	0.277	0.304	0.269	0.271	0.289
2-Hexanone		0.058	0.064	0.066	0.067

TK88:00038

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOMATRIX, INC.

ARI Job No: TK70 Project: FRP 2011 SHORELINE INVESTIG

Instrument ID: NT3 Calibration Date: 09/01/11

LAB FILE ID: RF0.2: 00_20901 RF0.5: 00_50901 RF1: 01_00901
RF2: 02_00901 RF10: 10_00901

COMPOUND	RF0.2	RF0.5	RF1	RF2	RF10
1,1,2-Trichloroethane	0.153	0.160	0.163	0.168	0.161
1,3-Dichloropropane	0.278	0.260	0.291	0.280	0.283
Tetrachloroethene	0.466	0.416	0.422	0.398	0.398
Chlorodibromomethane	0.174	0.188	0.192	0.188	0.205
1,2-Dibromoethane	0.134	0.157	0.152	0.152	0.162
Chlorobenzene	1.013	1.012	1.035	1.002	0.984
Ethyl Benzene	1.976	1.852	1.847	1.803	1.820
1,1,1,2-Tetrachloroethane	0.283	0.327	0.316	0.307	0.315
m,p-xylene	0.781	0.742	0.704	0.716	0.727
o-Xylene	0.725	0.681	0.728	0.707	0.716
Styrene	1.071	0.954	1.053	1.028	1.080
Bromoform	0.172	0.149	0.156	0.161	0.169
1,1,2,2-Tetrachloroethane	0.292	0.316	0.349	0.313	0.309
1,2,3-Trichloropropane		0.103	0.103	0.108	0.096
Trans-1,4-Dichloro 2-Butene			0.082	0.074	0.076
N-Propyl Benzene	4.033	3.815	3.775	3.775	3.693
Bromobenzene	0.622	0.714	0.702	0.660	0.670
Isopropyl Benzene	3.644	3.370	3.421	3.240	3.226
2-Chloro Toluene	2.361	2.429	2.335	2.289	2.303
4-Chloro Toluene	2.378	2.364	2.370	2.287	2.284
T-Butyl Benzene	2.674	2.679	2.543	2.534	2.536
1,3,5-Trimethyl Benzene	2.939	2.931	2.863	2.861	2.862
1,2,4-Trimethylbenzene	3.083	3.024	2.922	2.872	2.905
S-Butyl Benzene	3.988	3.888	3.750	3.756	3.652
4-Isopropyl Toluene	3.593	3.238	3.210	3.209	3.160
1,3-Dichlorobenzene	1.715	1.599	1.551	1.541	1.525
1,4-Dichlorobenzene	1.654	1.631	1.556	1.504	1.494
N-Butyl Benzene	2.998	2.865	2.818	2.743	2.737
1,2-Dichlorobenzene	1.335	1.374	1.330	1.326	1.293
1,2-Dibromo 3-Chloropropane		0.057	0.053	0.053	0.050
1,2,4-Trichlorobenzene		0.872	0.839	0.855	0.867
Hexachloro 1,3-Butadiene		0.488	0.508	0.458	0.416
Naphthalene		0.977	1.064	1.052	1.157
1,2,3-Trichlorobenzene		0.641	0.618	0.640	0.648
Dichlorodifluoromethane	0.589	0.606	0.551	0.516	0.540
Methyl tert butyl ether	0.748	0.932	1.000	0.903	0.946

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOMATRIX, INC.

ARI Job No: TK70 Project: FRP 2011 SHORELINE INVESTIG

Instrument ID: NT3 Calibration Date: 09/01/11

LAB FILE ID: RF0.2: 00_20901 RF0.5: 00_50901 RF1: 01_00901
RF2: 02_00901 RF10: 10_00901

COMPOUND	RF0.2	RF0.5	RF1	RF2	RF10
d4-1,2-Dichloroethane	0.336	0.366	0.360	0.365	0.365
d8-Toluene	1.309	1.268	1.258	1.255	1.269
4-Bromofluorobenzene	0.484	0.504	0.507	0.515	0.508
d4-1,2-Dichlorobenzene	0.822	0.865	0.848	0.851	0.846
Dibromofluoromethane	0.418	0.444	0.432	0.439	0.439

TK88:00040

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOMATRIX, INC.

ARI Job No: TK70 Project: FRP 2011 SHORELINE INVESTIG

Instrument ID: NT3 Calibration Date: 09/01/11

LAB FILE ID: RF20: 20_00901 RF40: 40_00901 RF80: 80_00901

COMPOUND	RF20	RF40	RF80
Chloromethane	0.498	0.520	0.483
Vinyl Chloride	0.605	0.635	0.610
Bromomethane	0.368	0.389	0.357
Chloroethane	0.381	0.404	0.353
Trichlorofluoromethane	0.850	0.881	0.822
Acrolein	0.027	0.029	0.028
112Trichloro122Trifluoroetha	0.585	0.616	0.567
Acetone	0.039	0.041	0.040
1,1-Dichloroethene	0.491	0.526	0.488
Bromoethane	0.424	0.443	0.412
Iodomethane	0.891	0.913	0.852
Methylene Chloride	0.470	0.487	0.456
Acrylonitrile	0.052	0.056	0.054
Carbon Disulfide	1.670	1.746	1.596
Trans-1,2-Dichloroethene	0.566	0.591	0.558
Vinyl Acetate	0.296	0.317	0.332
1,1-Dichloroethane	0.854	0.895	0.846
2-Butanone	0.056	0.059	0.059
2,2-Dichloropropane	0.756	0.800	0.707
Cis-1,2-Dichloroethene	0.544	0.570	0.539
Chloroform	0.874	0.905	0.866
Bromochloromethane	0.202	0.210	0.203
1,1,1-Trichloroethane	0.906	0.968	0.895
1,1-Dichloropropene	0.452	0.470	0.443
Carbon Tetrachloride	0.488	0.518	0.482
1,2-Dichloroethane	0.256	0.267	0.252
Benzene	1.231	1.282	1.158
Trichloroethene	0.360	0.374	0.350
1,2-Dichloropropane	0.247	0.260	0.249
Bromodichloromethane	0.324	0.346	0.333
Dibromomethane	0.109	0.114	0.108
2-Chloroethyl Vinyl Ether	0.084	0.086	0.086
4-Methyl-2-Pentanone	0.096	0.101	0.095
Cis 1,3-dichloropropene	0.368	0.396	0.378
Toluene	0.854	0.884	0.810
Trans 1,3-Dichloropropene	0.297	0.317	0.302
2-Hexanone	0.067	0.068	0.066

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOMATRIX, INC.

ARI Job No: TK70 Project: FRP 2011 SHORELINE INVESTIG

Instrument ID: NT3 Calibration Date: 09/01/11

LAB FILE ID: RF20: 20_00901 RF40: 40_00901 RF80: 80_00901

COMPOUND	RF20	RF40	RF80
1,1,2-Trichloroethane	0.162	0.169	0.160
1,3-Dichloropropane	0.273	0.288	0.279
Tetrachloroethene	0.390	0.405	0.386
Chlorodibromomethane	0.208	0.223	0.222
1,2-Dibromoethane	0.162	0.169	0.162
Chlorobenzene	0.978	0.997	0.920
Ethyl Benzene	1.793	1.796	1.545
1,1,1,2-Tetrachloroethane	0.318	0.338	0.330
m,p-xylene	0.720	0.729	0.648
o-Xylene	0.705	0.742	0.703
Styrene	1.075	1.116	1.043
Bromoform	0.178	0.193	0.195
1,1,2,2-Tetrachloroethane	0.313	0.322	0.314
1,2,3-Trichloropropane	0.099	0.103	0.100
Trans-1,4-Dichloro 2-Butene	0.079	0.081	0.084
N-Propyl Benzene	3.617	3.527	2.893
Bromobenzene	0.656	0.679	0.655
Isopropyl Benzene	3.189	3.150	2.675
2-Chloro Toluene	2.252	2.240	2.056
4-Chloro Toluene	2.268	2.284	2.054
T-Butyl Benzene	2.503	2.540	2.236
1,3,5-Trimethyl Benzene	2.864	2.850	2.439
1,2,4-Trimethylbenzene	2.897	2.903	2.457
S-Butyl Benzene	3.612	3.555	2.890
4-Isopropyl Toluene	3.150	3.109	2.591
1,3-Dichlorobenzene	1.502	1.539	1.435
1,4-Dichlorobenzene	1.476	1.506	1.402
N-Butyl Benzene	2.767	2.770	2.359
1,2-Dichlorobenzene	1.280	1.300	1.225
1,2-Dibromo 3-Chloropropane	0.051	0.055	0.055
1,2,4-Trichlorobenzene	0.894	0.906	0.881
Hexachloro 1,3-Butadiene	0.446	0.452	0.442
Naphthalene	1.217	1.228	1.184
1,2,3-Trichlorobenzene	0.662	0.666	0.645
Dichlorodifluoromethane	0.550	0.574	0.524
Methyl tert butyl ether	0.955	0.993	0.932

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GEOMATRIX, INC.

ARI Job No: TK70 Project: FRP 2011 SHORELINE INVESTIG

Instrument ID: NT3 Calibration Date: 09/01/11

LAB FILE ID: RF20: 20_00901 RF40: 40_00901 RF80: 80_00901

COMPOUND	RF20	RF40	RF80
d4-1,2-Dichloroethane	0.360	0.363	0.377
d8-Toluene	1.263	1.294	1.269
4-Bromofluorobenzene	0.516	0.509	0.518
d4-1,2-Dichlorobenzene	0.832	0.836	0.827
Dibromofluoromethane	0.455	0.451	0.459

TK88:00043

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC — Client: GEOMATRIX, INC.

ARI Job No: TK70 — Project: FRP 2011 SHORELINE INVESTIG

Instrument ID: NT3 — Calibration Date: 09/01/11

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
Chloromethane	AVRG	0.508	5.0
Vinyl Chloride	AVRG	0.624	4.2
Bromomethane	AVRG	0.376	5.2
Chloroethane	AVRG	0.392	7.5
Trichlorofluoromethane	AVRG	0.849	2.5
Acrolein	AVRG	0.027	5.5
112Trichloro122Trifluoroetha	AVRG	0.608	9.8
Acetone	AVRG	0.039	6.5
1,1-Dichloroethene	AVRG	0.508	5.2
Bromoethane	AVRG	0.421	5.3
Iodomethane	AVRG	0.880	3.8
Methylene Chloride	LINR		0.9987
Acrylonitrile	AVRG	0.048	19.6
Carbon Disulfide	AVRG	1.706	8.3
Trans-1,2-Dichloroethene	AVRG	0.575	5.2
Vinyl Acetate	AVRG	0.294	9.0
1,1-Dichloroethane	AVRG	0.864	4.3
2-Butanone	AVRG	0.056	6.1
2,2-Dichloropropane	AVRG	0.787	7.4
Cis-1,2-Dichloroethene	AVRG	0.554	5.1
Chloroform	AVRG	0.867	3.4
Bromochloromethane	AVRG	0.200	4.0
1,1,1-Trichloroethane	AVRG	0.919	4.3
1,1-Dichloropropene	AVRG	0.455	4.2
Carbon Tetrachloride	AVRG	0.484	4.6
1,2-Dichloroethane	AVRG	0.267	4.3
Benzene	AVRG	1.246	3.4
Trichloroethene	AVRG	0.374	5.6
1,2-Dichloropropane	AVRG	0.250	5.6
Bromodichloromethane	AVRG	0.326	3.6
Dibromomethane	AVRG	0.110	4.9
2-Chloroethyl Vinyl Ether	AVRG	0.080	8.1
4-Methyl-2-Pentanone	AVRG	0.096	3.5
Cis 1,3-dichloropropene	AVRG	0.363	5.0
Toluene	AVRG	0.865	4.2
Trans 1,3-Dichloropropene	AVRG	0.291	5.9
2-Hexanone	AVRG	0.065	5.3

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

TK88:00044

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC — Client: GEOMATRIX, INC.

ARI Job No: TK70 — Project: FRP 2011 SHORELINE INVESTIG

Instrument ID: NT3 — Calibration Date: 09/01/11

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
1,1,2-Trichloroethane	AVRG	0.162	3.1
1,3-Dichloropropane	AVRG	0.279	3.4
Tetrachloroethene	AVRG	0.410	6.2
Chlorodibromomethane	AVRG	0.200	8.7
1,2-Dibromoethane	AVRG	0.156	6.8
Chlorobenzene	AVRG	0.993	3.5
Ethyl Benzene	AVRG	1.804	6.7
1,1,1,2-Tetrachloroethane	AVRG	0.317	5.3
m,p-xylene	AVRG	0.721	5.2
o-Xylene	AVRG	0.713	2.6
Styrene	AVRG	1.053	4.6
Bromoform	AVRG	0.172	9.6
1,1,2,2-Tetrachloroethane	AVRG	0.316	5.0
1,2,3-Trichloropropane	AVRG	0.102	3.6
Trans-1,4-Dichloro 2-Butene	AVRG	0.080	4.6
N-Propyl Benzene	AVRG	3.641	9.3
Bromobenzene	AVRG	0.670	4.3
Isopropyl Benzene	AVRG	3.239	8.6
2-Chloro Toluene	AVRG	2.283	4.8
4-Chloro Toluene	AVRG	2.286	4.6
T-Butyl Benzene	AVRG	2.531	5.4
1,3,5-Trimethyl Benzene	AVRG	2.826	5.7
1,2,4-Trimethylbenzene	AVRG	2.883	6.5
S-Butyl Benzene	AVRG	3.636	9.2
4-Isopropyl Toluene	AVRG	3.158	8.7
1,3-Dichlorobenzene	AVRG	1.551	5.2
1,4-Dichlorobenzene	AVRG	1.528	5.4
N-Butyl Benzene	AVRG	2.757	6.6
1,2-Dichlorobenzene	AVRG	1.308	3.4
1,2-Dibromo 3-Chloropropane	AVRG	0.053	4.8
1,2,4-Trichlorobenzene	AVRG	0.873	2.6
Hexachloro 1,3-Butadiene	AVRG	0.458	6.7
Naphthalene	AVRG	1.126	8.5
1,2,3-Trichlorobenzene	AVRG	0.646	2.4
Dichlorodifluoromethane	AVRG	0.556	5.6
Methyl tert butyl ether	AVRG	0.926	8.5

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

TK88:00045

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC | Client: GEOMATRIX, INC.

ARI Job No: TK70 | Project: FRP 2011 SHORELINE INVESTIG

Instrument ID: NT3 | Calibration Date: 09/01/11

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
d4-1,2-Dichloroethane	AVRG	0.362	3.2
d8-Toluene	AVRG	1.273	1.5
4-Bromofluorobenzene	AVRG	0.508	2.1
d4-1,2-Dichlorobenzene	AVRG	0.841	1.7
Dibromofluoromethane	AVRG	0.442	3.0

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC — Client: GEOMATRIX, INC.

ARI Job No: TK70 — Project: FRP 2011 SHORELINE INVESTIG

Instrument ID: NT3 — Cont. Calib. Date: 09/05/11

Init. Calib. Date: 09/01/11 — Cont. Calib. Time: 0927

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift	
Chloromethane	0.508	0.504	0.100	AVRG	-0.8	
Vinyl Chloride	0.624	0.640	0.010	AVRG	2.6	
Bromomethane	0.376	0.376	0.010	AVRG	0.0	
Chloroethane	0.392	0.388	0.010	AVRG	-1.0	
Trichlorofluoromethane	0.849	0.861	0.010	AVRG	1.4	
Acrolein	0.027	0.019	0.010	AVRG	-29.6	<-
112Trichloro122Trifluoroetha	0.608	0.595	0.010	AVRG	-2.1	
Acetone	0.039	0.034	0.010	AVRG	-12.8	
1,1-Dichloroethene	0.507	0.495	0.010	AVRG	-2.4	
Bromoethane	0.421	0.404	0.010	AVRG	-4.0	
Iodomethane	0.880	0.852	0.010	AVRG	-3.2	
Methylene Chloride	10.000	9.979	0.010	LINR	-0.2	
Acrylonitrile	0.048	0.045	0.010	AVRG	-6.2	
Carbon Disulfide	1.706	1.708	0.010	AVRG	0.1	
Trans-1,2-Dichloroethene	0.574	0.552	0.010	AVRG	-3.8	
Vinyl Acetate	0.294	0.272	0.010	AVRG	-7.5	
1,1-Dichloroethane	0.864	0.847	0.100	AVRG	-2.0	
2-Butanone	0.056	0.051	0.010	AVRG	-8.9	
2,2-Dichloropropane	0.787	0.812	0.010	AVRG	3.2	
Cis-1,2-Dichloroethene	0.554	0.516	0.010	AVRG	-6.8	
Chloroform	0.867	0.834	0.010	AVRG	-3.8	
Bromochloromethane	0.201	0.191	0.010	AVRG	-5.0	
1,1,1-Trichloroethane	0.919	0.895	0.010	AVRG	-2.6	
1,1-Dichloropropene	0.455	0.448	0.010	AVRG	-1.5	
Carbon Tetrachloride	0.484	0.485	0.010	AVRG	0.2	
1,2-Dichloroethane	0.267	0.242	0.010	AVRG	-9.4	
Benzene	1.246	1.230	0.010	AVRG	-1.3	
Trichloroethene	0.374	0.357	0.010	AVRG	-4.5	
1,2-Dichloropropane	0.250	0.241	0.010	AVRG	-3.6	
Bromodichloromethane	0.326	0.312	0.010	AVRG	-4.3	
Dibromomethane	0.110	0.104	0.010	AVRG	-5.4	
2-Chloroethyl Vinyl Ether	0.080	0.077	0.010	AVRG	-3.8	
4-Methyl-2-Pentanone	0.096	0.086	0.010	AVRG	-10.4	
Cis 1,3-dichloropropene	0.363	0.363	0.010	AVRG	0.0	
Toluene	0.865	0.857	0.010	AVRG	-0.9	
Trans 1,3-Dichloropropene	0.291	0.286	0.010	AVRG	-1.7	
2-Hexanone	0.065	0.060	0.010	AVRG	-7.7	

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII VOA

TK88:00047

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC — Client: GEOMATRIX, INC.

ARI Job No: TK70 — Project: FRP 2011 SHORELINE INVESTIG

Instrument ID: NT3 — Cont. Calib. Date: 09/05/11

Init. Calib. Date: 09/01/11 — Cont. Calib. Time: 0927

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift	
1,1,2-Trichloroethane	0.162	0.152	0.010	AVRG	-6.2	
1,3-Dichloropropane	0.279	0.272	0.010	AVRG	-2.5	
Tetrachloroethene	0.410	0.413	0.010	AVRG	0.7	
Chlorodibromomethane	0.200	0.206	0.010	AVRG	3.0	
1,2-Dibromoethane	0.156	0.147	0.010	AVRG	-5.8	
Chlorobenzene	0.993	0.988	0.300	AVRG	-0.5	
Ethyl Benzene	1.804	1.888	0.010	AVRG	4.6	
1,1,1,2-Tetrachloroethane	0.317	0.317	0.010	AVRG	0.0	
m,p-xylene	0.721	0.757	0.010	AVRG	5.0	
o-Xylene	0.713	0.727	0.010	AVRG	2.0	
Styrene	1.052	1.069	0.010	AVRG	1.6	
Bromoform	0.172	0.174	0.100	AVRG	1.2	
1,1,2,2-Tetrachloroethane	0.316	0.286	0.300	AVRG	-9.5	*
1,2,3-Trichloropropane	0.102	0.097	0.010	AVRG	-4.9	
Trans-1,4-Dichloro 2-Butene	0.079	0.075	0.010	AVRG	-5.1	
N-Propyl Benzene	3.641	4.000	0.010	AVRG	9.8	
Bromobenzene	0.670	0.666	0.010	AVRG	-0.6	
Isopropyl Benzene	3.239	3.462	0.010	AVRG	6.9	
2-Chloro Toluene	2.283	2.400	0.010	AVRG	5.1	
4-Chloro Toluene	2.286	2.420	0.010	AVRG	5.9	
T-Butyl Benzene	2.531	2.716	0.010	AVRG	7.3	
1,3,5-Trimethyl Benzene	2.826	3.060	0.010	AVRG	8.3	
1,2,4-Trimethylbenzene	2.883	3.065	0.010	AVRG	6.3	
S-Butyl Benzene	3.636	3.946	0.010	AVRG	8.5	
4-Isopropyl Toluene	3.158	3.397	0.010	AVRG	7.6	
1,3-Dichlorobenzene	1.551	1.540	0.010	AVRG	-0.7	
1,4-Dichlorobenzene	1.528	1.487	0.010	AVRG	-2.7	
N-Butyl Benzene	2.757	3.048	0.010	AVRG	10.6	
1,2-Dichlorobenzene	1.308	1.260	0.010	AVRG	-3.7	
1,2-Dibromo 3-Chloropropane	0.053	0.051	0.010	AVRG	-3.8	
1,2,4-Trichlorobenzene	0.873	0.882	0.010	AVRG	1.0	
Hexachloro 1,3-Butadiene	0.458	0.492	0.010	AVRG	7.4	
Naphthalene	1.126	1.080	0.010	AVRG	-4.1	
1,2,3-Trichlorobenzene	0.646	0.631	0.010	AVRG	-2.3	
Dichlorodifluoromethane	0.556	0.558	0.010	AVRG	0.4	
Methyl tert butyl ether	0.926	0.844	0.010	AVRG	-8.8	

<- Exceeds QC limit of 20% D

* RF less than minimum RF

FORM VII VOA

TK88:00048

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC — Client: GEOMATRIX, INC.

ARI Job No: TK70 — Project: FRP 2011 SHORELINE INVESTIG

Instrument ID: NT3 — Cont. Calib. Date: 09/05/11

Init. Calib. Date: 09/01/11 — Cont. Calib. Time: 0927

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
d4-1,2-Dichloroethane	0.362	0.344	0.010	AVRG	-5.0
d8-Toluene	1.273	1.262	0.010	AVRG	-0.9
4-Bromofluorobenzene	0.508	0.514	0.010	AVRG	1.2
d4-1,2-Dichlorobenzene	0.841	0.834	0.010	AVRG	-0.8
Dibromofluoromethane	0.442	0.434	0.010	AVRG	-1.8

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII VOA

TK88:00049

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC — Client: GEOMATRIX, INC.

ARI Job No: TK70 — Project: FRP 2011 SHORELINE INVESTIGA

Ical Midpoint ID: 10_00901 — Ical Date: 09/01/11

Instrument ID: NT3 — Project Run Date: 09/05/11

		IS1(PFB) AREA #	RT #	IS2(DFB) AREA #	RT #	IS3(CLB) AREA #	RT #
	ICAL MIDPT	220246	5.25	342057	5.64	343287	7.71
	UPPER LIMIT	440492	5.75	684114	6.14	686574	8.21
	LOWER LIMIT	110123	4.75	171028	5.14	171644	7.21
	Sample ID						
01	LCS0905	224673	5.25	356553	5.65	349569	7.72
02	LCS0905	225745	5.25	353038	5.64	353083	7.71
03	MB0905	214386	5.25	337284	5.64	346723	7.71
04	TRIP BLANKS	224110	5.26	349530	5.65	342112	7.71
05	TRIP BLANK	220243	5.25	336612	5.64	341065	7.72
06	FRP-090111-0	226644	5.25	354475	5.64	345596	7.71
07	FRP-090111-0	223107	5.25	357901	5.65	340227	7.72
08	FRP-090111-0	225134	5.25	349563	5.65	350197	7.72
09	FRP-090111-0	220388	5.25	349790	5.65	357361	7.72
10	FRP-090111-0	224841	5.25	356487	5.64	347794	7.71
11	FRP-090111-0	218103	5.26	344810	5.64	343336	7.71
12	FRP-090111-0	225767	5.26	354508	5.65	350666	7.72
13	FRP-090111-0	218593	5.25	346129	5.64	343552	7.71
14	FRP-090211-0	214498	5.25	333525	5.64	344440	7.71
15	FRP-090211-0	208938	5.25	324423	5.64	340284	7.72
16	FRP-090211-0	214831	5.26	335087	5.65	344468	7.71
17	FRP-090111-0	227032	5.25	348485	5.64	343495	7.71
18	FRP-090111-0	224777	5.26	349897	5.64	340243	7.71
19							
20							
21							
22							

IS1 (PFB) = Pentafluorobenzene
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CLB) = d5-Chlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC — Client: GEOMATRIX, INC.

ARI Job No: TK70 — Project: FRP 2011 SHORELINE INVESTIGA

Ical Midpoint ID: 10_00901 — Ical Date: 09/01/11

Instrument ID: NT3 — Project Run Date: 09/05/11

		IS4(DCB) AREA #	RT #	AREA #	RT #	AREA #	RT #
	ICAL MIDPT	212149	9.41				
	UPPER LIMIT	424298	9.91				
	LOWER LIMIT	106074	8.91				
	Sample ID						
01	LCS0905	213568	9.41				
02	LCS0905	214456	9.41				
03	MB0905	207853	9.41				
04	TRIP BLANKS	201981	9.41				
05	TRIP BLANK	206172	9.41				
06	FRP-090111-0	202051	9.42				
07	FRP-090111-0	204109	9.41				
08	FRP-090111-0	213495	9.41				
09	FRP-090111-0	212622	9.41				
10	FRP-090111-0	210520	9.41				
11	FRP-090111-0	205347	9.41				
12	FRP-090111-0	207844	9.41				
13	FRP-090111-0	206684	9.41				
14	FRP-090211-0	204797	9.41				
15	FRP-090211-0	204146	9.41				
16	FRP-090211-0	206592	9.41				
17	FRP-090111-0	211023	9.41				
18	FRP-090111-0	212299	9.41				
19							
20							
21							
22							

IS4 (DCB) = d4-1,4-Dichlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

Analytical Resources Inc.: Organics Instrument Log

NT-3 Serial No.: US81221575

Date: 9/5/11 Analysis: 8260C Analyst: PC

GC Program: VOA1 Column No: 80088J Column Type: RTX VMS

Instrument Tune (.U or .CT.): bfb0905 EM Voltage: 1353

Calibration File: cc0905 Curve Date: 9/1/11 Injection Vol.: 10

IS/SS	Ical/Ccal	LCS/ICV
VW6993	VW7007-3	VW7007-3

Document All Maintenance Tasks In StarLIMS

INTERNAL STANDARD SUMMARY FOR DATABATCH - /chem3/nt3.i/09052011.b

	Time	Filename	LabID	ClientID		WT									
1	0854	bfb0905.d	BFB0905	BFB0905		0.00									
2	0927	cc0905.d	CC0905	CC0905			1	5.25	224325	5.64	360257	7.71	343356	9.41	207803
3	0954	lcs0905.d	LCS0905	LCS0905			1	5.25	224672	5.65	356553	7.72	349569	9.41	213568
4	1021	lcs0905a.d	LCS0905	LCS0905			1	5.26	228745	5.64	353038	7.71	353085	9.41	214456
5	1048	mb0905.d	MB0905	MB0905			1	5.25	214308	5.64	337284	7.71	346723	9.41	207853
6	1119	tk70i.d	TK70I	Trip Blanks	1	<2	1	5.26	224310	5.65	349530	7.71	342112	9.42	201981
7	1146	tk88d.d	TK88D	Trip Blank	1		1	5.25	220243	5.64	336612	7.72	341065	9.41	206172
8	1213	tk43e.d	TK43E	Trip Blanks	1		1	5.25	219546	5.64	333196	7.71	342736	9.41	208374
9	1244	tk70a.d	TK70A	FRP-090111-001	2	7	1	5.25	226844	5.64	354475	7.71	345596	9.42	202051
10	1313	tk70b.d	TK70B	FRP-090111-002	2		1	5.25	223107	5.65	357901	7.72	340227	9.41	204109
11	1340	tk70c.d	TK70C	FRP-090111-003	2		1	5.25	228138	5.65	349063	7.72	350197	9.41	213495
12	1407	tk70d.d	TK70D	FRP-090111-004	2		1	5.25	220388	5.65	349790	7.72	357361	9.41	222622
13	1533	tk70e.d	TK70E	FRP-090111-005	2		1	5.25	224841	5.64	356487	7.71	347794	9.41	218628
14	1559	tk70f.d	TK70F	FRP-090111-006	3		1	5.26	218103	5.64	344810	7.71	343336	9.41	205347
15	1626	tk70g.d	TK70G	FRP-090111-007	2		1	5.26	225767	5.65	354508	7.72	350636	9.41	207844
16	1653	tk70h.d	TK70H	FRP-090111-008	2		1	5.25	218593	5.64	346229	7.72	343552	9.41	206684
17	1719	tk88a.d	TK88A	FRP-090211-001	1		1	5.25	214494	5.64	333625	7.71	344440	9.41	204797
18	1746	tk88b.d	TK88B	FRP-090211-002	1	10	1	5.25	208936	5.64	324423	7.72	340264	9.41	204146
19	1813	tk88c.d	TK88C	FRP-090211-003	1	7	1	5.26	214831	5.65	335087	7.71	344468	9.41	206592
20	1840	tk43a.d	TK43A	I-GW23-GW195-110820	1	4	1	5.26	215174	5.64	326817	7.71	331748	9.41	207314
21	1906	tk43b.d	TK43B	I-GW23-GW204-110836	2	<2	1	5.26	218512	5.64	331502	7.71	337221	9.41	209707
22	1933	tk43c.d	TK43C	I-GW23-GW189-120830	4	1	1	5.26	219139	5.64	340281	7.71	133906	9.42	203942
23	1953	tk43d.d	TK43D	I-GW23-GWDUP-120830	3	<2	1	5.25	228259	5.64	340156	7.72	335748	9.41	205409
24	2026	tk70ams.d	TK70A	FRP-090111-001	3	7	1	5.25	227032	5.66	348485	7.71	343435	9.61	211023
25	2052	tk70amsd.d	TK70A	FRP-090111-001	4	7	1	5.26	224779	5.64	349897	7.71	340263	9.41	212259

PC 9/6/11

Every line must contain information or be lined out. Make all entries legible.
Start a new page for each QC period. Document All Maintenance Tasks In StarLIMS

Metals Analysis
Report and Summary QC Forms

ARI Job ID: TK88, TK89

Cover Page

INORGANIC ANALYSIS DATA PACKAGE

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I

SDG: TK88

CLIENT ID	ARI ID	ARI LIMS ID	REPREP
FRP-090211-001	TK88A	11-19092	
FRP-090211-001D	TK88ADUP	11-19092	
FRP-090211-001S	TK88ASPK	11-19092	
FRP-090211-002	TK88B	11-19093	
PBW	TK88MB1	11-19093	
LCSW	TK88MB1SPK	11-19093	
FRP-090211-003	TK88C	11-19094	

Were ICP interelement corrections applied ?	Yes/No	YES
Were ICP background corrections applied ?	Yes/No	YES
If yes - were raw data generated before application of background corrections ?	Yes/No	NO

Comments: _____

THIS DATA PACKAGE HAS BEEN REVIEWED AND AUTHORIZED FOR RELEASE BY:

Signature: Jay Kuhn Name: Jay Kuhn

Date: 9/13/11 Title: Inorganics Director

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: FRP-090211-001
SAMPLE

Lab Sample ID: TK88A
LIMS ID: 11-19092
Matrix: Water
Data Release Authorized:
Reported: 09/12/11

QC Report No: TK88-AMEC Geomatrix
Project: FRP 2011 Shoreline Investigation 8769
Date Sampled: 09/02/11
Date Received: 09/02/11

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	09/06/11	6010B	09/09/11	**7429-90-5**	**Aluminum**	25.7	50	**5,430**	
200.8	09/06/11	200.8	09/09/11	7440-38-2	Arsenic	0.12	1	1	U
3010A	09/06/11	6010B	09/09/11	7440-43-9	Cadmium	0.18	2	2	U
3010A	09/06/11	6010B	09/09/11	**7440-47-3**	**Chromium**	1.24	5	**8**	
3010A	09/06/11	6010B	09/09/11	**7440-50-8**	**Copper**	0.92	2	**7**	
200.8	09/06/11	200.8	09/08/11	**7439-92-1**	**Lead**	0.046	0.1	**0.5**	
3010A	09/06/11	6010B	09/09/11	7440-02-0	Nickel	3.9	10	10	U
3010A	09/06/11	6010B	09/09/11	7782-49-2	Selenium	5.0	50	50	U
3010A	09/06/11	6010B	09/09/11	7440-28-0	Thallium	3.1	50	50	U
3010A	09/06/11	6010B	09/09/11	**7440-62-2**	**Vanadium**	0.27	3	**16**	
3010A	09/06/11	6010B	09/09/11	**7440-66-6**	**Zinc**	1.4	10	**50**	

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: FRP-090211-001
DUPLICATE

Lab Sample ID: TK88A
LIMS ID: 11-19092
Matrix: Water
Data Release Authorized:
Reported: 09/12/11

QC Report No: TK88-AMEC Geomatrix
Project: FRP 2011 Shoreline Investigation 8769
Date Sampled: 09/02/11
Date Received: 09/02/11

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Aluminum	6010B	5,430	5,100	6.3%	+/- 20%	
Arsenic	200.8	1 U	2	66.7%	+/- 1	L
Cadmium	6010B	2 U	2 U	0.0%	+/- 2	L
Chromium	6010B	8	8	0.0%	+/- 5	L
Copper	6010B	7	7	0.0%	+/- 2	L
Lead	200.8	0.5	0.5	0.0%	+/- 20%	
Nickel	6010B	10 U	10 U	0.0%	+/- 10	L
Selenium	6010B	50 U	50 U	0.0%	+/- 50	L
Thallium	6010B	50 U	50 U	0.0%	+/- 50	L
Vanadium	6010B	16	16	0.0%	+/- 20%	
Zinc	6010B	50	50	0.0%	+/- 10	L

Reported in µg/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: FRP-090211-001
MATRIX SPIKE

Lab Sample ID: TK88A
LIMS ID: 11-19092
Matrix: Water
Data Release Authorized:
Reported: 09/12/11

QC Report No: TK88-AMEC Geomatrix
Project: FRP 2011 Shoreline Investigation 8769
Date Sampled: 09/02/11
Date Received: 09/02/11

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Aluminum	6010B	5,430	7,550	2,000	106%	
Arsenic	200.8	1.25 U	28.6	25.0	114%	
Cadmium	6010B	2.00 U	533	500	107%	
Chromium	6010B	8.41	535	500	105%	
Copper	6010B	6.96	555	500	110%	
Lead	200.8	0.520	26.0	25.0	102%	
Nickel	6010B	10.0 U	499	500	99.8%	
Selenium	6010B	50.0 U	2,100	2,000	105%	
Thallium	6010B	50.0 U	1,950	2,000	97.5%	
Vanadium	6010B	16.3	539	500	105%	
Zinc	6010B	50.3	545	500	98.9%	

Reported in µg/L

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked
NR-Not Recovered

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: FRP-090211-002
SAMPLE

Lab Sample ID: TK88B
LIMS ID: 11-19093
Matrix: Water
Data Release Authorized:
Reported: 09/12/11

QC Report No: TK88-AMEC Geomatrix
Project: FRP 2011 Shoreline Investigation 8769
Date Sampled: 09/02/11
Date Received: 09/02/11

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	09/06/11	6010B	09/09/11	**7429-90-5**	**Aluminum**	25.7	50	**17,100**	
200.8	09/06/11	200.8	09/08/11	**7440-38-2**	**Arsenic**	0.12	1	**5**	
3010A	09/06/11	6010B	09/09/11	7440-43-9	Cadmium	0.18	2	2	U
3010A	09/06/11	6010B	09/09/11	**7440-47-3**	**Chromium**	1.24	5	**54**	
3010A	09/06/11	6010B	09/09/11	**7440-50-8**	**Copper**	0.92	2	**57**	
200.8	09/06/11	200.8	09/08/11	**7439-92-1**	**Lead**	0.115	0.2	**5.1**	
3010A	09/06/11	6010B	09/09/11	**7440-02-0**	**Nickel**	3.9	10	**20**	
3010A	09/06/11	6010B	09/09/11	7782-49-2	Selenium	5.0	50	50	U
3010A	09/06/11	6010B	09/09/11	7440-28-0	Thallium	3.1	50	50	U
3010A	09/06/11	6010B	09/09/11	**7440-62-2**	**Vanadium**	0.27	3	**212**	
3010A	09/06/11	6010B	09/09/11	**7440-66-6**	**Zinc**	1.4	10	**60**	

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

TK88:00058

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: FRP-090211-003
SAMPLE

Lab Sample ID: TK88C
LIMS ID: 11-19094
Matrix: Water
Data Release Authorized:
Reported: 09/12/11

QC Report No: TK88-AMEC Geomatrix
Project: FRP 2011 Shoreline Investigation 8769
Date Sampled: 09/02/11
Date Received: 09/02/11

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	09/06/11	6010B	09/09/11	7429-90-5	Aluminum	25.7	50	50	U
200.8	09/06/11	200.8	09/08/11	7440-38-2	Arsenic	0.048	0.2	0.2	U
3010A	09/06/11	6010B	09/09/11	7440-43-9	Cadmium	0.18	2	2	U
3010A	09/06/11	6010B	09/09/11	7440-47-3	Chromium	1.24	5	5	U
3010A	09/06/11	6010B	09/09/11	7440-50-8	Copper	0.92	2	2	U
200.8	09/06/11	200.8	09/08/11	7439-92-1	Lead	0.115	0.2	0.2	U
3010A	09/06/11	6010B	09/09/11	7440-02-0	Nickel	3.9	10	10	U
3010A	09/06/11	6010B	09/09/11	7782-49-2	Selenium	5.0	50	50	U
3010A	09/06/11	6010B	09/09/11	7440-28-0	Thallium	3.1	50	50	U
3010A	09/06/11	6010B	09/09/11	7440-62-2	Vanadium	0.27	3	3	U
3010A	09/06/11	6010B	09/09/11	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: METHOD BLANK

Lab Sample ID: TK88MB
LIMS ID: 11-19093
Matrix: Water
Data Release Authorized:
Reported: 09/12/11

QC Report No: TK88-AMEC Geomatrix
Project: FRP 2011 Shoreline Investigation 8769
Date Sampled: NA
Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	09/06/11	6010B	09/09/11	7429-90-5	Aluminum	25.7	50	50	U
200.8	09/06/11	200.8	09/08/11	7440-38-2	Arsenic	0.048	0.2	0.2	U
3010A	09/06/11	6010B	09/09/11	7440-43-9	Cadmium	0.18	2	2	U
3010A	09/06/11	6010B	09/09/11	7440-47-3	Chromium	1.24	5	5	U
3010A	09/06/11	6010B	09/09/11	7440-50-8	Copper	0.92	2	2	U
200.8	09/06/11	200.8	09/08/11	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	09/06/11	6010B	09/09/11	7440-02-0	Nickel	3.9	10	10	U
3010A	09/06/11	6010B	09/09/11	7782-49-2	Selenium	5.0	50	50	U
3010A	09/06/11	6010B	09/09/11	7440-28-0	Thallium	3.1	50	50	U
3010A	09/06/11	6010B	09/09/11	7440-62-2	Vanadium	0.27	3	3	U
3010A	09/06/11	6010B	09/09/11	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: LAB CONTROL

Lab Sample ID: TK88LCS
LIMS ID: 11-19093
Matrix: Water
Data Release Authorized:
Reported: 09/12/11

QC Report No: TK88-AMEC Geomatrix
Project: FRP 2011 Shoreline Investigation 8769
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Aluminum	6010B	2120	2000	106%	
Arsenic	200.8	26.6	25.0	106%	
Cadmium	6010B	517	500	103%	
Chromium	6010B	532	500	106%	
Copper	6010B	507	500	101%	
Lead	200.8	27.1	25.0	108%	
Nickel	6010B	500	500	100%	
Selenium	6010B	2020	2000	101%	
Thallium	6010B	2020	2000	101%	
Vanadium	6010B	522	500	104%	
Zinc	6010B	500	500	100%	

Reported in µg/L

N-Control limit not met
Control Limits: 80-120%

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I

UNITS: ug/L

SDG: TK88

ANALYTE	EL	M	RUN	ICVTV	ICV	%R	CCVTV	CCV1	%R	CCV2	%R	CCV3	%R	CCV4	%R	CCV5	%R
Aluminum	AL	ICP	IP090971	2000.0	2007.81	100.4	2000.0	2015.29	100.8	1996.94	99.8	2020.43	101.0	2019.28	101.0	1997.36	99.9
Arsenic	AS	PMS	MS090881	50.0	50.26	100.5	50.0	50.26	100.5	49.98	100.0	49.50	99.0	49.32	98.6	49.07	98.1
Cadmium	CD	ICP	IP090971	1000.0	1030.32	103.0	1000.0	1032.67	103.3	1039.90	104.0	1024.08	102.4	1008.55	100.9	1037.03	103.7
Chromium	CR	ICP	IP090971	1000.0	1023.75	102.4	1000.0	1026.56	102.7	1015.21	101.5	1020.30	102.0	1012.73	101.3	1005.99	100.6
Copper	CU	ICP	IP090971	1000.0	1024.91	102.5	1000.0	1019.67	102.0	1033.22	103.3	1022.44	102.2	1013.27	101.3	1033.20	103.3
Lead	PB	PMS	MS090881	50.0	50.19	100.4	50.0	50.59	101.2	50.89	101.8	51.65	103.3	51.35	102.7	52.21	104.4
Nickel	NI	ICP	IP090971	1000.0	991.91	99.2	1000.0	990.89	99.1	972.17	97.2	964.71	96.5	958.60	95.9	954.13	95.4
Selenium	SE	ICP	IP090971	2000.0	2001.29	100.1	2000.0	1983.58	99.2	1989.01	99.5	1935.29	96.8	1918.84	95.9	1952.94	97.6
Thallium	TL	ICP	IP090971	2000.0	1968.98	98.4	2000.0	1945.90	97.3	1950.82	97.5	1903.29	95.2	1885.73	94.3	1920.41	96.0
Vanadium	V	ICP	IP090971	1000.0	1003.84	100.4	1000.0	994.79	99.5	1005.07	100.5	991.49	99.1	985.98	98.6	1006.89	100.7
Zinc	ZN	ICP	IP090971	1000.0	981.31	98.1	1000.0	981.82	98.2	971.24	97.1	965.96	96.6	961.40	96.1	961.04	96.1

Control Limits: Mercury 80-120; Other Metals 90-110

FORM II (1)

TK88.000052

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I

UNITS: ug/L

SDG: TK88

ANALYTE	EL	M	RUN	CCVTV	CCV6	%R	CCV7	%R	CCV8	%R	CCV9	%R	CCV10	%R	CCV11	%R
Aluminum	AL	ICP	IP090971	2000.0	2017.84	100.9	2016.07	100.8	1997.17	99.9	1999.71	100.0	2011.60	100.6		
Arsenic	AS	PMS	MS090881	50.0	48.83	97.7	49.45	98.9	49.59	99.2	48.84	97.7	49.36	98.7	48.85	97.7
Cadmium	CD	ICP	IP090971	1000.0	1019.61	102.0	1013.67	101.4	1026.03	102.6	1035.40	103.5	1024.28	102.4		
Chromium	CR	ICP	IP090971	1000.0	1020.01	102.0	1023.77	102.4	1013.19	101.3	1014.34	101.4	1022.19	102.2		
Copper	CU	ICP	IP090971	1000.0	1024.82	102.5	1014.44	101.4	1028.92	102.9	1036.73	103.7	1018.84	101.9		
Lead	PB	PMS	MS090881	50.0	51.42	102.8	52.81	105.6	52.93	105.9	51.52	103.0	51.23	102.5	52.16	104.3
Nickel	NI	ICP	IP090971	1000.0	971.12	97.1	976.60	97.7	963.48	96.3	970.58	97.1	985.18	98.5		
Selenium	SE	ICP	IP090971	2000.0	1944.99	97.2	1951.31	97.6	1959.81	98.0	1965.10	98.3	1981.37	99.1		
Thallium	TL	ICP	IP090971	2000.0	1908.13	95.4	1922.56	96.1	1927.22	96.4	1937.70	96.9	1955.12	97.8		
Vanadium	V	ICP	IP090971	1000.0	997.17	99.7	990.94	99.1	998.08	99.8	1007.50	100.8	997.60	99.8		
Zinc	ZN	ICP	IP090971	1000.0	971.54	97.2	974.85	97.5	960.72	96.1	961.14	96.1	975.12	97.5		

Control Limits: Mercury 80-120; Other Metals 90-110

FORM II (1)

TK88 : 00063

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I

UNITS: ug/L

SDG: TK88

ANALYTE	EL	M	RUN	ICVTV	ICV	%R	CCVTV	CCV1	%R	CCV2	%R	CCV3	%R	CCV4	%R	CCV5	%R
Arsenic	AS	PMS	MS090981	50.0	50.04	100.1	50.0	50.17	100.3	49.18	98.4	49.43	98.9	48.90	97.8	48.44	96.9

Control Limits: Mercury 80-120; Other Metals 90-110

TK88:00064

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I

UNITS:ug/L

SDG: TK88

ANALYTE	EL	M	RUN	CCVTV	CCV6	%R	CCV7	%R	CCV8	%R	CCV9	%R	CCV10	%R	CCV11	%R
Arsenic	AS	PMS	MS090981	50.0	48.62	97.2	49.29	98.6	49.49	99.0	49.17	98.3	49.31	98.6	49.64	99.3

Control Limits: Mercury 80-120; Other Metals 90-110

FORM II (1)

TK88 : 00055

CRDL Standard

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I

UNITS:ug/L

SDG: TK88

ANALYTE	EL	M	RUN	CRA/I TV	CR-1	%R	CR-2	%R	CR-3	%R	CR-4	%R	CR-5	%R	CR-6	%R
Aluminum	AL	ICP	IP090971	50.0	57.79	**115.6**	70.77	**141.5**	64.75	**129.5**						
Arsenic	AS	PMS	MS090881	0.2	0.19	**95.0**										
Cadmium	CD	ICP	IP090971	2.0	2.05	**102.5**	2.10	**105.0**	2.00	**100.0**						
Chromium	CR	ICP	IP090971	5.0	6.23	**124.6**	6.22	**124.4**	6.46	**129.2**						
Copper	CU	ICP	IP090971	2.0	2.32	**116.0**	2.76	**138.0**	2.37	**118.5**						
Lead	PB	PMS	MS090881	0.1	0.11	**110.0**										
Nickel	NI	ICP	IP090971	10.0	8.97	**89.7**	9.79	**97.9**	9.72	**97.2**						
Selenium	SE	ICP	IP090971	50.0	60.45	**120.9**	57.18	**114.4**	52.62	**105.2**						
Thallium	TL	ICP	IP090971	50.0	48.95	**97.9**	49.55	**99.1**	50.93	**101.9**						
Vanadium	V	ICP	IP090971	3.0	3.18	**106.0**	3.05	**101.7**	3.13	**104.3**						
Zinc	ZN	ICP	IP090971	10.0	9.54	**95.4**	9.68	**96.8**	9.38	**93.8**						

Control Limits: no control limits have been established by the EPA at this time.

TK88 : 000055

CRDL Standard

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I

SDG: TK88

UNITS: ug/L

ANALYTE	EL	M	RUN	CRA/I TV	CR-1	%R	CR-2	%R	CR-3	%R	CR-4	%R	CR-5	%R	CR-6	%R
Arsenic	AS	PMS	MS090981	0.2	0.20	100.0										

Control Limits: no control limits have been established by the EPA at this time.

FORM II (2)

TK88.000067

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I

UNITS:ug/L

SDG: TK88

ANALYTE	EL	METH	RUN	CRDL	IDL	ICB	C	CCB1	C	CCB2	C	CCB3	C	CCB4	C	CCB5	C
Aluminum	AL	ICP	IP090971	200.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Arsenic	AS	PMS	MS090881	10.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Cadmium	CD	ICP	IP090971	5.0	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Chromium	CR	ICP	IP090971	10.0	5.0	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Copper	CU	ICP	IP090971	25.0	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Lead	PB	PMS	MS090881	3.0	0.1	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
Nickel	NI	ICP	IP090971	40.0	10.0	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U
Selenium	SE	ICP	IP090971	5.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Thallium	TL	ICP	IP090971	10.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Vanadium	V	ICP	IP090971	50.0	3.0	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
Zinc	ZN	ICP	IP090971	20.0	10.0	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U

TK88 : 00068

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I

UNITS: ug/L

SDG: TK88

ANALYTE	EL	METH	RUN	CRDL	IDL	CCB6	C	CCB7	C	CCB8	C	CCB9	C	CCB10	C	CCB11	C
Aluminum	AL	ICP	IP090971	200.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U		
Arsenic	AS	PMS	MS090881	10.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Cadmium	CD	ICP	IP090971	5.0	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U		
Chromium	CR	ICP	IP090971	10.0	5.0	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U		
Copper	CU	ICP	IP090971	25.0	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U		
Lead	PB	PMS	MS090881	3.0	0.1	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
Nickel	NI	ICP	IP090971	40.0	10.0	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U		
Selenium	SE	ICP	IP090971	5.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U		
Thallium	TL	ICP	IP090971	10.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U		
Vanadium	V	ICP	IP090971	50.0	3.0	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U		
Zinc	ZN	ICP	IP090971	20.0	10.0	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U		

TK88 : 000059

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I

UNITS: ug/L

SDG: TK88

ANALYTE	EL	METH	RUN	CRDL	IDL	ICB	C	CCB1	C	CCB2	C	CCB3	C	CCB4	C	CCB5	C
Arsenic	AS	PMS	MS090981	10.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U

TK88:000170

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I

SDG: TK88

UNITS: ug/L

ANALYTE	EL	METH	RUN	CRDL	IDL	CCB6	C	CCB7	C	CCB8	C	CCB9	C	CCB10	C	CCB11	C
Arsenic	AS	PMS	MS090981	10.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U

TK88:00071

ICP Interference Check Sample

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

ICS SOURCE: I.V.

PROJECT: FRP 2011 Shoreline I

RUNID: IP090971

SDG: TK88

INSTRUMENT ID: OPTIMA ICP 2

UNITS: ug/L

ANALYTE	ICSA TV	ICSAB TV	ICSA1	ICSAB1	%R	ICSA2	ICSAB2	%R	ICSA3	ICSAB3	%R
Aluminum	200000	200000	199814.8	198810.5	99.4	196672.3	197970.5	99.0	199642.3	198776.0	99.4
Antimony		1000	0.2	953.3	95.3	-5.3	947.4	94.7	-1.5	941.7	94.2
Arsenic		1000	6.2	1001.2	100.1	14.2	992.4	99.2	12.1	994.2	99.4
Barium		1000	0.1	999.0	99.9	0.2	973.1	97.3	0.7	989.7	99.0
Beryllium		1000	0.1	981.8	98.2	0.0	968.0	96.8	0.1	986.7	98.7
Boron			-5.3	-6.3		-7.9	-7.5		-7.9	-8.3	
Cadmium		1000	1.5	1011.5	101.2	1.6	1007.6	100.8	1.7	996.2	99.6
Calcium	100000	100000	102127.1	100541.8	100.5	100518.4	100817.1	100.8	101629.5	100253.5	100.3
Chromium		1000	0.0	1019.0	101.9	-0.1	1006.1	100.6	1.4	1014.1	101.4
Cobalt		1000	0.7	978.5	97.9	0.6	948.5	94.9	0.6	963.2	96.3
Copper		1000	-1.6	1031.5	103.2	-1.1	1042.8	104.3	-1.7	1024.8	102.5
Iron	200000	200000	198144.3	193647.8	96.8	192748.8	190473.8	95.2	196657.0	192351.1	96.2
Lead		1000	-2.8	964.7	96.5	-3.6	953.8	95.4	-3.5	953.4	95.3
Magnesium	100000	100000	102378.4	97837.0	97.8	101153.9	97411.8	97.4	101674.3	97113.1	97.1
Manganese		1000	0.4	948.1	94.8	0.2	930.3	93.0	0.2	943.8	94.4
Molybdenum			1.3	1.2		0.8	1.3		0.8	1.2	
Nickel		1000	0.2	950.5	95.1	0.4	925.4	92.5	-0.7	940.1	94.0
Potassium			45.5	291.1		82.1	292.6		52.7	299.3	
Selenium		1000	11.9	1008.1	100.8	10.2	991.2	99.1	10.5	994.1	99.4
Silicon			-3.8	-5.9		-5.1	-5.7		-1.2	-3.8	
Silver		1000	-0.9	1010.4	101.0	-0.7	997.8	99.8	-0.8	999.0	99.9
Sodium			15.0	16.7		42.5	36.5		5.5	10.0	
Strontium			10.5	10.3		10.4	10.3		10.7	10.5	
Thallium		1000	16.1	958.0	95.8	15.7	946.4	94.6	14.4	952.0	95.2
Tin			-4.1	-5.1		-4.7	-5.0		-4.6	-4.4	
Titanium			5.3	6.8		6.0	6.0		5.7	6.8	
Vanadium		1000	4.8	976.6	97.7	3.6	983.6	98.4	4.1	968.9	96.9
Zinc		1000	0.8	944.8	94.5	-0.3	926.4	92.6	-0.4	930.9	93.1

TK88:000172

ICP Interference Check Sample

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

ICS SOURCE: I.V.

PROJECT: FRP 2011 Shoreline I

RUNID: MS090881

SDG: TK88

INSTRUMENT ID: PE ELAN 6000

UNITS: ug/L

ANALYTE	ICSA TV	ICSAB TV	ICSA1	ICSAB1	%R	ICSA2	ICSAB2	%R	ICSA3	ICSAB3	%R
Antimony			0.1	0.1							
Arsenic		20	0.0	19.5	**97.5**						
Cadmium		20	0.0	20.0	**100.0**						
Iron	20000	20000	20167.9	20414.6	**102.1**						
Silver		20	0.0	19.4	**97.0**						

TK88 : 000173

ICP Interference Check Sample

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

ICS SOURCE: I.V.

PROJECT: FRP 2011 Shoreline I

RUNID: MS090981

SDG: TK88

INSTRUMENT ID: PE ELAN 6000

UNITS: ug/L

ANALYTE	ICSA TV	ICSAB TV	ICSA1	ICSAB1	%R	ICSA2	ICSAB2	%R	ICSA3	ICSAB3	%R
Arsenic		20	0.0	19.0	**95.0**						
Cadmium		20	0.0	19.5	**97.5**						
Chromium		20	0.7	20.1	**100.5**						
Cobalt		20	0.0	19.1	**95.5**						
Copper		20	0.4	19.6	**98.0**						
Manganese		20	0.5	20.1	**100.5**						
Molybdenum	400	400	400.8	392.6	**98.2**						
Nickel		20	0.5	18.9	**94.5**						
Silver		20	0.0	19.1	**95.5**						
Vanadium			0.0	-0.4							
Zinc		20	0.9	19.9	**99.5**						

TK88 : 00071

ICP Serial Dilutions

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I

ANALYSIS METHOD: ICP

SDG: TK88

UNITS: ug/L

ANALYTE	CLIENT ID	ARI ID	MATRIX	RUNID	INITIAL SAMPLE RESULT (I)	C	SERIAL DILUTION RESULT (S)	C	% DIFFER-ENCE	Q
Aluminum	FRP-090211-001L	TK88A-L	Water	IP090971	5429.46		5880.05		8.3	
Cadmium	FRP-090211-001L	TK88A-L	Water	IP090971	0.65	U	10.00	U		
Chromium	FRP-090211-001L	TK88A-L	Water	IP090971	8.41	B	25.00	U	100.0	
Copper	FRP-090211-001L	TK88A-L	Water	IP090971	6.96	B	10.00	U	100.0	
Nickel	FRP-090211-001L	TK88A-L	Water	IP090971	6.26	U	50.00	U		
Selenium	FRP-090211-001L	TK88A-L	Water	IP090971	17.01	U	250.00	U		
Thallium	FRP-090211-001L	TK88A-L	Water	IP090971	13.05	U	250.00	U		
Vanadium	FRP-090211-001L	TK88A-L	Water	IP090971	16.32	B	16.70	B	2.3	
Zinc	FRP-090211-001L	TK88A-L	Water	IP090971	50.33		55.60	B	10.5	

ICP Serial Dilutions

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I

ANALYSIS METHOD: PMS

SDG: TK88

UNITS: ug/L

ANALYTE	CLIENT ID	ARI ID	MATRIX	RUNID	INITIAL SAMPLE RESULT (I)	C	SERIAL DILUTION RESULT (S)	C	% DIFFER-ENCE	Q
Lead	FRP-090211-001L	TK88A-L	Water	MS090881	0.52	B	0.55	B	5.8	
Arsenic	FRP-090211-001L	TK88A-L	Water	MS090981	0.41	U	0.41	U		

IDLs and ICP Linear Ranges

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I

SDG: TK88 UNITS: ug/L

ANALYTE	EL	METH	INSTRUMENT	WAVELENTH (nm)	GFA BACK-GROUND	CLP CRDL	RL	RL DATE	ICP LINEAR RANGE (ug/L)	ICP LR DATE
Aluminum	AL	ICP	OPTIMA ICP 2	308.22		200	50.0	4/1/2011	250000.0	8/3/2011
Arsenic	AS	PMS	PE ELAN 6000 MS	0.00		10	0.2	4/1/2011		
Cadmium	CD	ICP	OPTIMA ICP 2	228.80		5	2.0	4/1/2011	20000.0	8/3/2011
Chromium	CR	ICP	OPTIMA ICP 2	267.72		10	5.0	4/1/2011	100000.0	8/3/2011
Copper	CU	ICP	OPTIMA ICP 2	324.75		25	2.0	4/1/2011	40000.0	8/3/2011
Lead	PB	PMS	PE ELAN 6000 MS	0.00		3	0.1	4/1/2011		
Nickel	NI	ICP	OPTIMA ICP 2	231.60		40	10.0	4/1/2011	100000.0	8/3/2011
Selenium	SE	ICP	OPTIMA ICP 2	196.02		5	50.0	4/1/2011	20000.0	8/3/2011
Thallium	TL	ICP	OPTIMA ICP 2	190.86		10	50.0	4/1/2011	30000.0	8/3/2011
Vanadium	V	ICP	OPTIMA ICP 2	292.40		50	3.0	4/1/2011	50000.0	8/3/2011
Zinc	ZN	ICP	OPTIMA ICP 2	213.86		20	10.0	4/1/2011	100000.0	8/3/2011

ICP Interelement Correction Factors

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I

IEC DATE: 9/7/2011

SDG: TK88

INSTRUMENT ID: OPTIMA ICP 2

ANALYTE	WAVELENGTH	AL	AS	BA	BE	CA	CD	CO	CR	CU	FE
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	10.6149000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0773398	0.0000000	-0.8345790	1.1215100	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.1892080	0.0000000	0.0000000	0.0622379
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	228.80	0.0000000	5.2418600	0.0000000	0.0000000	0.0000000	0.0000000	0.1195910	0.0000000	0.0000000	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.5252460	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0187178	0.0000000	0.0000000	0.0000000	0.0000000	-0.0439811
Cobalt	228.62	0.0000000	0.0000000	0.1238430	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.2279050	-0.0318969	0.0000000	-0.0695283
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-1.6163900	0.0000000	0.0000000
Lead	220.35	-0.1778670	0.0000000	0.0000000	0.0000000	-0.0252598	0.0000000	0.0000000	-2.3072100	1.2452600	0.0570036
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.1525560	0.0000000	-1.6380600	-1.2519300	0.0000000	0.6727000
Manganese	257.61	0.0051426	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.0048944
Molybdenum	202.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0228298	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0634207	0.0000000	0.3514040	0.0000000	0.0000000	0.0000000
Silicon	288.16	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-3.4885200	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	6.5805300	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.0678735	0.0000000	1.7836600	0.3510820	0.0000000	-0.1294840
Tin	189.93	0.0000000	0.0000000	0.0000000	0.0000000	-0.1147000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Titanium	334.90	0.0000000	0.0000000	0.0000000	0.0000000	0.1641450	0.0000000	0.0000000	0.1632010	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-3.9361800	0.0000000	0.1100040
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.1475900	0.0000000	0.0000000

TK88 : 000178

ICP Interelement Correction Factors

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I

IEC DATE: 9/7/2011

SDG: TK88

INSTRUMENT ID: OPTIMA ICP 2

ANALYTE	WAVELENGTH	MG	MN	MO	NI	PB	SB	TI	TL	V	ZN
Aluminum	308.22	0.0000000	0.0000000	15.3131000	0.0000000	0.0000000	0.0000000	1.5167500	0.0000000	17.6996000	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	-0.4730780	0.0000000	0.0000000	-0.8897510	0.0000000	-3.3546800	0.0000000
Arsenic	188.98	0.0000000	0.0000000	2.3330800	0.0000000	0.0000000	0.0000000	-5.4412000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0766262	0.0000000	0.0000000	0.0000000	0.0000000	0.6419380	0.0000000
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.2960780	0.0000000
Cadmium	228.80	0.0000000	0.0000000	0.0000000	-0.7324130	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0581570	0.0000000	0.1395070	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.2773470	0.0000000
Cobalt	228.62	0.0000000	0.0000000	-0.1579570	0.1588330	0.0000000	0.0000000	1.8115900	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0080384	0.0000000	0.2688440	0.0000000	0.0000000	0.0000000	0.2461180	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	8.4403600	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	-4.6256200	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	257.61	0.0048376	0.0000000	0.0000000	0.0000000	-0.2175850	0.0000000	0.0000000	0.0000000	-0.0271775	0.0000000
Molybdenum	202.03	0.0148620	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.7744280	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0735290	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silicon	288.16	-0.1460000	0.0000000	-2.7358100	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.2442620	0.2419260	0.0000000	0.0000000	0.0000000	-0.0470302	0.0000000	-0.2758080	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	242.4230000	0.0000000	0.0000000	318.1570000
Thallium	190.80	0.0000000	-1.4179000	1.9562000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	1.2892100	0.0000000
Tin	189.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.5848020	-0.3044710	0.0000000	0.0000000	0.0000000
Titanium	334.90	0.0000000	0.0000000	0.9873960	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.40	0.0000000	-0.1398510	-0.6804250	0.0000000	0.0000000	0.0000000	0.6004670	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.2377960	0.0000000	-0.0708227	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

TK88 . 00075

Preparation Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

ANALYSIS METHOD: ICP

PROJECT: FRP 2011 Shoreline I

ARI PREP CODE: TWC

SDG: TK88

PREPDATE: 9/6/2011

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
FRP-090211-001	TK88A	0.000	50.0	50.0
FRP-090211-001D	TK88ADUP	0.000	50.0	50.0
FRP-090211-001S	TK88ASPK	0.000	50.0	50.0
FRP-090211-002	TK88B	0.000	50.0	50.0
FRP-090211-003	TK88C	0.000	50.0	50.0
PBW	TK88MB1	0.000	50.0	50.0
LCSW	TK88MB1SPK	0.000	50.0	50.0

Preparation Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

ANALYSIS METHOD: PMS

PROJECT: FRP 2011 Shoreline I

ARI PREP CODE: REN

SDG: TK88

PREPDATE: 9/6/2011

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
FRP-090211-001	TK88A	0.000	50.0	25.0
FRP-090211-001D	TK88ADUP	0.000	50.0	25.0
FRP-090211-001S	TK88ASPK	0.000	50.0	25.0
FRP-090211-002	TK88B	0.000	50.0	25.0
FRP-090211-003	TK88C	0.000	50.0	25.0
PBW	TK88MB1	0.000	50.0	25.0
LCSW	TK88MB1SPK	0.000	50.0	25.0

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I INSTRUMENT ID: OPTIMA ICP 2 START DATE: 9/9/2011

SDG: TK88 RUNID: IP090971 METHOD: ICP END DATE: 9/9/2011

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	09553			X						X		X	X								X			X				X		X	X
S2	S2	1.00	09594									X		X	X																	X	
S3	S3	1.00	10012																				X			X				X			X
S4	S4	1.00	10035																														
S5	S5	1.00	10060			X																											
ICV	ICV	1.00	10210			X						X		X	X								X			X				X		X	X
ICB	ICB	1.00	10250			X						X		X	X								X			X				X		X	X
CRI	CRII	1.00	10291			X						X		X	X								X			X				X		X	X
ICSA	ICSAI	1.00	10332			X						X		X	X								X			X				X		X	X
ICSAB	ICSABI	1.00	10373			X						X		X	X								X			X				X		X	X
CCV	CCV1	1.00	10412			X						X		X	X								X			X				X		X	X
CCB	CCB1	1.00	10451			X						X		X	X								X			X				X		X	X
ZZZZZZ	TL11MB	2.00	10493																														
PBW	TK88MB1	1.00	10534																														
FRP-090211-001L	TK88A-L	5.00	10575			X						X		X	X								X			X				X		X	X
FRP-090211-001	TK88A	1.00	11020			X						X		X	X								X			X				X		X	X
FRP-090211-001D	TK88ADUP	1.00	11061			X						X		X	X								X			X				X		X	X
FRP-090211-001S	TK88ASPK	1.00	11104			X						X		X	X								X			X				X		X	X
ZZZZZZ	ZZZZZZ	1.00	11150																														
FRP-090211-002	TK88B	1.00	11192			X						X		X	X								X			X				X		X	X
FRP-090211-003	TK88C	1.00	11233			X						X		X	X								X			X				X		X	X
LCSW	TK88MB1SPK	1.00	11274			X						X		X	X								X			X				X		X	X
CCV	CCV2	1.00	11314			X						X		X	X								X			X				X		X	X
CCB	CCB2	1.00	11354			X						X		X	X								X			X				X		X	X
CRI	CRIF	1.00	11395			X						X		X	X								X			X				X		X	X
ICSA	ICSAF	1.00	11440			X						X		X	X								X			X				X		X	X
ICSAB	ICSABF	1.00	11481			X						X		X	X								X			X				X		X	X
CCV	CCV3	1.00	11520			X						X		X	X								X			X				X		X	X
CCB	CCB3	1.00	11560			X						X		X	X								X			X				X		X	X
ZZZZZZ	TL17MB1	2.00	12001																														
ZZZZZZ	TL17B	2.00	12042																														
ZZZZZZ	TL17C	2.00	12083																														
ZZZZZZ	TL17D	2.00	12124																														
ZZZZZZ	TL17E	2.00	12170																														
ZZZZZZ	TL17ADUP	2.00	12211																														

FORM XIV

TK88 : 000082

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I INSTRUMENT ID: OPTIMA ICP 2 START DATE: 9/9/2011

SDG: TK88 RUNID: IP090971 METHOD: ICP END DATE: 9/9/2011

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
ZZZZZZ	TL17A	2.00	12252																														
ZZZZZZ	TL17ASPK	2.00	12292																														
ZZZZZZ	TL17APOST	2.00	12332																														
ZZZZZZ	TL17MB1SPK	2.00	12372																														
CCV	CCV4	1.00	12411			X						X		X	X								X			X				X		X	X
CCB	CCB4	1.00	12451			X						X		X	X								X			X				X		X	X
ZZZZZZ	TL05MB	1.00	12492																														
ZZZZZZ	TL05A	1.00	12533																														
ZZZZZZ	TL05B	1.00	12574																														
ZZZZZZ	TL05C	1.00	13015																														
ZZZZZZ	TL05D	1.00	13060																														
ZZZZZZ	TL05E	1.00	13101																														
ZZZZZZ	TL11F	2.00	13143																														
ZZZZZZ	TL11G	2.00	13182																														
ZZZZZZ	TL11H	2.00	13222																														
ZZZZZZ	TL11MBSPK	2.00	13262																														
CCV	CCV5	1.00	13301			X						X		X	X								X			X				X		X	X
CCB	CCB5	1.00	13341			X						X		X	X								X			X				X		X	X
PBW	TK88MB1	1.00	13382			X						X		X	X								X			X				X		X	X
ZZZZZZ	TL05F	1.00	13424																														
ZZZZZZ	TL08B	2.00	13465																														
ZZZZZZ	TL08C	2.00	13504																														
ZZZZZZ	TL08D	2.00	13544																														
ZZZZZZ	TL08E	2.00	13584																														
ZZZZZZ	TL08F	2.00	14023																														
ZZZZZZ	TL08G	2.00	14063																														
ZZZZZZ	TL08H	2.00	14102																														
ZZZZZZ	TL05MBSPK	1.00	14144																														
CCV	CCV6	1.00	14183			X						X		X	X								X			X				X		X	X
CCB	CCB6	1.00	14223			X						X		X	X								X			X				X		X	X
ZZZZZZ	TL08MB1	2.00	14264																														
ZZZZZZ	TL08A-L	10.00	14305																														
ZZZZZZ	TL08A	2.00	14345																														
ZZZZZZ	TL08ADUP	2.00	14385																														
ZZZZZZ	TL08ASPK	2.00	14424																														

FORM XIV

TK88 : 000033

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I | INSTRUMENT ID: OPTIMA ICP 2 | START DATE: 9/9/2011

SDG: TK88 | RUNID: IP090971 METHOD: ICP | END DATE: 9/9/2011

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
ZZZZZZ	ZZZZZZ	2.00	14463																														
ZZZZZZ	TL08I	2.00	14501																														
ZZZZZZ	TL08J	2.00	14541																														
ZZZZZZ	TL08K	2.00	14581																														
ZZZZZZ	TL08MB1SPK	2.00	15020																														
CCV	CCV7	1.00	15060			X						X		X	X								X			X				X		X	X
CCB	CCB7	1.00	15100			X						X		X	X								X			X				X		X	X
ZZZZZZ	TL08MB2	1.00	15141																														
ZZZZZZ	TL08M-L	5.00	15182																														
ZZZZZZ	TL08M	1.00	15223																														
ZZZZZZ	TL08L	2.00	15265																														
ZZZZZZ	TL17ADUP	2.00	15304																														
ZZZZZZ	TL17A	2.00	15345																														
ZZZZZZ	TL17ASPK	2.00	15391																														
ZZZZZZ	TL08MB2SPK	1.00	15431																														
CCV	CCV8	1.00	15540			X						X		X	X								X			X				X		X	X
CCB	CCB8	1.00	15580			X						X		X	X								X			X				X		X	X
ZZZZZZ	TL48MB	2.00	16020																														
ZZZZZZ	TL38MB1	2.00	16062																														
ZZZZZZ	ZZZZZZ	10.00	16103																														
ZZZZZZ	TL38A	2.00	16142																														
ZZZZZZ	TL48A	2.00	16182																														
ZZZZZZ	TL08L	2.00	16221																														
ZZZZZZ	TL38MB1SPK	2.00	16260																														
ZZZZZZ	TL48MBSPK	2.00	16300																														
ZZZZZZ	ZZZZZZ	2.00	16341																														
CCV	CCV9	1.00	16402			X						X		X	X								X			X				X		X	X
CCB	CCB9	1.00	16441			X						X		X	X								X			X				X		X	X
ZZZZZZ	TL38A-L	25.00	16483																														
ZZZZZZ	TL38A	5.00	16522																														
ZZZZZZ	ZZZZZZ	1.00	16581																														
CRI	CRIF1	1.00	17024			X						X		X	X								X			X				X		X	X
ICSA	ICSAF1	1.00	17065			X						X		X	X								X			X				X		X	X
ICSAB	ICSABF1	1.00	17110			X						X		X	X								X			X				X		X	X
CCV	CCV10	1.00	17144			X						X		X	X								X			X				X		X	X

FORM XIV

TK88 : 000001

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I | INSTRUMENT ID: OPTIMA ICP 2 | START DATE: 9/9/2011

SDG: TK88 | RUNID: IP090971 METHOD: ICP | END DATE: 9/9/2011

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
CCB	CCB10	1.00	17184			X						X		X	X								X			X				X		X	X

TK88 : 000035

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I INSTRUMENT ID: PE ELAN 6000 MS START DATE: 9/8/2011

SDG: TK88 RUNID: MS090881 METHOD: PMS END DATE: 9/8/2011

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	08420				X																	X									
S1	S1	1.00	08480				X																	X									
S2	S2	1.00	08550				X																	X									
S3	S3	1.00	09020				X																	X									
S4	S4	1.00	09080				X																	X									
ZZZZZZ	Rinse Sampl	1.00	09150																														
ICV	MICV	1.00	09210				X																	X									
ICB	ICB	1.00	09270				X																	X									
CCV	MCCV1	1.00	09340				X																	X									
CCB	CCB1	1.00	09440				X																	X									
CRI	MCRI	1.00	09500				X																	X									
ICSA	ICSAI	1.00	09570				X																	X									
ICSAB	ICSABI	1.00	10030				X																	X									
CCV	MCCV2	1.00	10100				X																	X									
CCB	CCB2	1.00	10160				X																	X									
ZZZZZZ	TJ71RMB2	1.00	10220																														
ZZZZZZ	TJ71RMB2SPK	1.00	10280																														
ZZZZZZ	TJ71RF	1.00	10330																														
ZZZZZZ	TJ71RG	1.00	10390																														
ZZZZZZ	TJ71RH	1.00	10450																														
ZZZZZZ	TJ71RI	1.00	10500																														
ZZZZZZ	TJ71RJ	1.00	10560																														
CCV	MCCV3	1.00	11020				X																	X									
CCB	CCB3	1.00	11080				X																	X									
ZZZZZZ	TK57MB1	2.00	11140																														
ZZZZZZ	TK57MB1SPK	2.00	11200																														
ZZZZZZ	TK57A-L	10.00	11250																														
ZZZZZZ	TK57A	2.00	11310																														
ZZZZZZ	TK57ADUP	2.00	11370																														
ZZZZZZ	TK57ASPK	2.00	11420																														
ZZZZZZ	TK70A-L	10.00	11480																														
ZZZZZZ	TK70A	2.00	11540																														
ZZZZZZ	TK70ADUP	2.00	12000																														
ZZZZZZ	TK70ASPK	2.00	12050																														
CCV	MCCV4	1.00	12110				X																	X									

FORM XIV

TK88 : 00086

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I INSTRUMENT ID: PE ELAN 6000 MS START DATE: 9/8/2011

SDG: TK88 RUNID: MS090881 METHOD: PMS END DATE: 9/8/2011

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
CCB	CCB4	1.00	12170				X																	X									
ZZZZZZ	TK70MB1	2.00	12230																														
ZZZZZZ	TK70MB1SPK	2.00	12290																														
FRP-090211-001L	TK88A-L	10.00	12350																					X									
FRP-090211-001	TK88A	2.00	12400																					X									
FRP-090211-001D	TK88ADUP	2.00	12460																					X									
FRP-090211-001S	TK88ASPK	2.00	12510																					X									
ZZZZZZ	TK57B	2.00	12570																														
ZZZZZZ	TK57C	2.00	13030																														
ZZZZZZ	TK57D	2.00	13080																														
ZZZZZZ	TK57E	2.00	13140																														
CCV	MCCV5	1.00	13200				X																	X									
CCB	CCB5	1.00	13260				X																	X									
S0	S0	1.00	13330				X																	X									
CCV	MCCV6	1.00	13390				X																	X									
CCB	CCB6	1.00	13450				X																	X									
ZZZZZZ	TK57F	2.00	13520																														
ZZZZZZ	TK70B	2.00	13570																														
ZZZZZZ	TK70C	2.00	14030																														
ZZZZZZ	TK70D	2.00	14080																														
ZZZZZZ	TK70E	2.00	14140																														
ZZZZZZ	TK70F	2.00	14200																														
ZZZZZZ	TK70G	2.00	14250																														
ZZZZZZ	TK70H	2.00	14310																														
FRP-090211-002	TK88B	2.00	14360																														
FRP-090211-003	TK88C	2.00	14420				X																										
CCV	MCCV7	1.00	14480				X																	X									
CCB	CCB7	1.00	14540				X																	X									
S0	S0	1.00	15000				X																	X									
CCV	MCCV8	1.00	15230				X																	X									
CCB	CCB8	1.00	15290				X																	X									
FRP-090211-002	TK88B	5.00	15350				X																	X									
FRP-090211-003	TK88C	5.00	15410																					X									
ZZZZZZ	TK57F	2.00	15470																														
ZZZZZZ	TK70B	2.00	15520																														

FORM XIV

TK88 : 00067

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I INSTRUMENT ID: PE ELAN 6000 MS START DATE: 9/8/2011

SDG: TK88 RUNID: MS090881 METHOD: PMS END DATE: 9/8/2011

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
ZZZZZZ	TK70C	5.00	15580																														
ZZZZZZ	TK70D	2.00	16030																														
ZZZZZZ	TK70E	5.00	16090																														
ZZZZZZ	TK70F	2.00	16150																														
ZZZZZZ	TK70G	2.00	16200																														
ZZZZZZ	TK70H	2.00	16260																														
CCV	MCCV9	1.00	16310				X																	X									
CCB	CCB9	1.00	16380				X																	X									
ZZZZZZ	TK70D	5.00	16440																														
ZZZZZZ	TK70F	5.00	16490																														
ZZZZZZ	TK70G	5.00	16550																														
ZZZZZZ	TK70H	5.00	17010																														
CCV	MCCV10	1.00	17060				X																	X									
CCB	CCB10	1.00	17130				X																	X									
PBW	TK88MB1	2.00	17190				X																	X									
ZZZZZZ	TK50MB1	20.00	17240																														
ZZZZZZ	TK50MB1SPK	20.00	17300																														
LCSW	TK88MB1SPK	2.00	17360				X																	X									
ZZZZZZ	TK57D	2.00	17410																														
ZZZZZZ	TK50ADUP	20.00	17470																														
ZZZZZZ	TK50A	20.00	17530																														
ZZZZZZ	TK50ASPK	20.00	17580																														
ZZZZZZ	TK50B	20.00	18040																														
ZZZZZZ	TK50C	20.00	18090																														
CCV	MCCV11	1.00	18150				X																	X									
CCB	CCB11	1.00	18210				X																	X									

FORM XIV

TK88 : 00088

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I INSTRUMENT ID: PE ELAN 6000 MS START DATE: 9/9/2011

SDG: TK88 RUNID: MS090981 METHOD: PMS END DATE: 9/9/2011

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	09330				X																										
S1	S1	1.00	09410				X																										
S2	S2	1.00	09490				X																										
S3	S3	1.00	09560				X																										
S4	S4	1.00	10040				X																										
ZZZZZZ	Rinse Sampl	1.00	10120																														
ICV	MICV	1.00	10190				X																										
ICB	ICB	1.00	10270				X																										
CCV	MCCV1	1.00	10340				X																										
CCB	CCB1	1.00	10410				X																										
ZZZZZZ	ZZZZZZ	1.00	10480																														
ZZZZZZ	ZZZZZZ	1.00	10560																														
ZZZZZZ	ZZZZZZ	1.00	11030																														
ZZZZZZ	LR200	1.00	11110																														
ZZZZZZ	LR300	1.00	11180																														
CCV	MCCV2	1.00	11260				X																										
CCB	CCB2	1.00	11330				X																										
S0	S0	1.00	11540				X																										
CCV	MCCV3	1.00	12010				X																										
CCB	CCB3	1.00	12090				X																										
CRI	MCRI	1.00	12170				X																										
ICSA	ICSAI	1.00	12240				X																										
ICSAB	ICSABI	1.00	12320				X																										
CCV	MCCV4	1.00	12410				X																										
CCB	CCB4	1.00	12480				X																										
ZZZZZZ	TL12MB1	2.00	12550																														
ZZZZZZ	TL12MB2	2.00	13010																														
ZZZZZZ	TL12MB1SPK	2.00	13080																														
ZZZZZZ	TL12MB2SPK	2.00	13150																														
ZZZZZZ	TL12A	2.00	13210																														
ZZZZZZ	TL12B	2.00	13280																														
ZZZZZZ	TK57D	2.00	13340																														
ZZZZZZ	TK50E	20.00	13410																														
ZZZZZZ	TL08B	20.00	13480																														
ZZZZZZ	TL08C	20.00	13540																														

FORM XIV

TK88 : 000085

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I INSTRUMENT ID: PE ELAN 6000 MS START DATE: 9/9/2011

SDG: TK88 RUNID: MS090981 METHOD: PMS END DATE: 9/9/2011

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
CCV	MCCV5	1.00	14010				X																										
CCB	CCB5	1.00	14080				X																										
S0	S0	1.00	14150				X																										
CCV	MCCV6	1.00	14230				X																										
CCB	CCB6	1.00	14300				X																										
ZZZZZZ	TL08MB2	2.00	14370																														
ZZZZZZ	TL08MB2SPK	2.00	14440																														
ZZZZZZ	ZZZZZZ	10.00	14510																														
FRP-090211-001	TK88A	2.00	14570																														
FRP-090211-001D	TK88ADUP	2.00	15040																														
FRP-090211-001S	TK88ASPK	2.00	15100																														
ZZZZZZ	ZZZZZZ	10.00	15170																														
ZZZZZZ	TL08M	2.00	15230																														
ZZZZZZ	TL08D	20.00	15300																														
ZZZZZZ	TL08E	20.00	15360																														
CCV	MCCV7	1.00	15430				X																										
CCB	CCB7	1.00	15500				X																										
S0	S0	1.00	15570				X																										
CCV	MCCV8	1.00	16070				X																										
CCB	CCB8	1.00	16150				X																										
ZZZZZZ	TL38MB1	20.00	16220																														
ZZZZZZ	TL38MB1SPK	20.00	16290																														
ZZZZZZ	ZZZZZZ	100.00	16360																														
ZZZZZZ	TL38A	20.00	16420																														
ZZZZZZ	TL08F	20.00	16490																														
ZZZZZZ	TL08G	20.00	16550																														
ZZZZZZ	TL08H	20.00	17020																														
ZZZZZZ	TL08I	20.00	17090																														
ZZZZZZ	TL08J	20.00	17150																														
ZZZZZZ	TL08K	20.00	17220																														
CCV	MCCV9	1.00	17280				X																										
CCB	CCB9	1.00	17350				X																										
ZZZZZZ	TL08MB1	20.00	17430																														
ZZZZZZ	TL08MB1SPK	20.00	17490																														
ZZZZZZ	TL08A-L	100.00	17560																														

FORM XIV

TK88 : 090930

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I INSTRUMENT ID: PE ELAN 6000 MS START DATE: 9/9/2011

SDG: TK88 RUNID: MS090981 METHOD: PMS END DATE: 9/9/2011

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
ZZZZZZ	TL08A	20.00	18020																														
ZZZZZZ	TL08ADUP	20.00	18090																														
ZZZZZZ	TL08ASPK	20.00	18150																														
ZZZZZZ	ZZZZZZ	20.00	18220																														
ZZZZZZ	TL08L	20.00	18280																														
ZZZZZZ	TK85A	20.00	18350																														
ZZZZZZ	TK85B	20.00	18420																														
CCV	MCCV10	1.00	18480				X																										
CCB	CCB10	1.00	18550				X																										
ZZZZZZ	TK85MB	20.00	19030																														
ZZZZZZ	TK85MBSPK	20.00	19090																														
FRP-090211-001L	TK88A-L	25.00	19160				X																										
FRP-090211-001	TK88A	5.00	19220				X																										
FRP-090211-001D	TK88ADUP	5.00	19290				X																										
FRP-090211-001S	TK88ASPK	5.00	19350				X																										
ZZZZZZ	TK57D	5.00	19420																														
ZZZZZZ	TK85C	20.00	19480																														
CCV	MCCV11	1.00	19550				X																										
CCB	CCB11	1.00	20020				X																										

TK88 : 000051

Mercury Analysis
Report and Summary QC Forms

ARI Job ID: TK88, TK89

Cover Page

INORGANIC ANALYSIS DATA PACKAGE

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I

SDG: TK89

CLIENT ID	ARI ID	ARI LIMS ID	REPREP
FRP-090211-001	TK89A	11-19096	
FRP-090211-001D	TK89ADUP	11-19096	
FRP-090211-001S	TK89ASPK	11-19096	
FRP-090211-002	TK89B	11-19097	
PBW	TK89MB1	11-19097	
LCSW	TK89MB1SPK	11-19097	
FRP-090211-003	TK89C	11-19098	

Were ICP interelement corrections applied ?	Yes/No	YES
Were ICP background corrections applied ?	Yes/No	YES
If yes - were raw data generated before application of background corrections ?	Yes/No	NO

Comments: _____

THIS DATA PACKAGE HAS BEEN REVIEWED AND AUTHORIZED FOR RELEASE BY:

Signature: _____ Name: Jay Kuhn

Date: 9/9/11 Title: Inorganics Director

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
Total Mercury by Method SW7470A

Data Release Authorized:
Reported: 09/09/11
Date Received: 09/02/11

QC Report No: TK89-AMEC Geomatrix
Project: FRP 2011 Shoreline Investigation
8769

Client/ ARI ID	Date Sampled	Matrix	Prep Date Anal Date	RL	Result
FRP-090211-001 TK89A 11-19096	09/02/11	Water	09/06/11 09/09/11	20.0	20.0 U
FRP-090211-002 TK89B 11-19097	09/02/11	Water	09/06/11 09/09/11	**20.0**	**35.7**
FRP-090211-003 TK89C 11-19098	09/02/11	Water	09/06/11 09/09/11	20.0	20.0 U
MB-090611 Method Blank	NA	Water	09/06/11 09/09/11	20.0	20.0 U

Reported in ng/L

RL-Analytical reporting limit
U-Undetected at reported detection limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: FRP-090211-001
DUPLICATE

Lab Sample ID: TK89A
LIMS ID: 11-19096
Matrix: Water
Data Release Authorized:
Reported: 09/09/11

QC Report No: TK89-AMEC Geomatrix
Project: FRP 2011 Shoreline Investigation 8769
Date Sampled: 09/02/11
Date Received: 09/02/11

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Mercury	7470A	20.0 U	20.0 U	0.0%	+/- 20.0	L

Reported in ng/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: FRP-090211-001
MATRIX SPIKE

Lab Sample ID: TK89A
LIMS ID: 11-19096
Matrix: Water
Data Release Authorized:
Reported: 09/09/11

QC Report No: TK89-AMEC Geomatrix
Project: FRP 2011 Shoreline Investigation 8769
Date Sampled: 09/02/11
Date Received: 09/02/11

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Mercury	7470A	20.0 U	103	100	103%	

Reported in ng/L

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: LAB CONTROL

Lab Sample ID: TK89LCS
LIMS ID: 11-19097
Matrix: Water
Data Release Authorized:
Reported: 09/09/11

QC Report No: TK89-AMEC Geomatrix
Project: FRP 2011 Shoreline Investigation 8769
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Mercury	7470A	202	200	101%	

Reported in ng/L

N-Control limit not met
Control Limits: 80-120%

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I

UNITS:ng/L

SDG: TK89

ANALYTE	EL	M	RUN	ICVTV	ICV	%R	CCVTV	CCV1	%R	CCV2	%R	CCV3	%R	CCV4	%R	CCV5	%R
Mercury	HG	CVL	HG090901	500.0	503.00	100.6	500.0	508.00	101.6	514.00	102.8	517.00	103.4				

Control Limits: Mercury 80-120; Other Metals 90-110

FORM II (1)

TK88:00098

CRDL Standard

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I

UNITS:ng/L

SDG: TK89

ANALYTE	EL	M	RUN	CRA/I TV	CR-1	%R	CR-2	%R	CR-3	%R	CR-4	%R	CR-5	%R	CR-6	%R
Mercury	HG	CVL	HG090901	20.0	19.80	99.0										

Control Limits: no control limits have been established by the EPA at this time.

FORM II (2)

TK89.00055

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I

UNITS:ng/L

SDG: TK89

ANALYTE	EL	METH	RUN	CRDL	IDL	ICB	C	CCB1	C	CCB2	C	CCB3	C	CCB4	C	CCB5	C
Mercury	HG	CVL	HG090901	25.0	20.0	20.0	U	20.0	U	20.0	U	20.0	U				

TK89:00100

IDLs and ICP Linear Ranges

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I

SDG: TK89

UNITS: ng/L

ANALYTE	EL	METH	INSTRUMENT	WAVELENTH (nm)	GFA BACK-GROUND	CLP CRDL	RL	RL DATE	ICP LINEAR RANGE (ng/L)	ICP LR DATE
Mercury	HG	CVL	CETAC MERCURY	253.70		25	20.0	4/1/2011		

Preparation Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

ANALYSIS METHOD: CVL

PROJECT: FRP 2011 Shoreline I

ARI PREP CODE: TLM

SDG: TK89

PREPDATE: 9/6/2011

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
FRP-090211-001	TK89A	0.000	20.0	20.0
FRP-090211-001D	TK89ADUP	0.000	20.0	20.0
FRP-090211-001S	TK89ASPK	0.000	20.0	20.0
FRP-090211-002	TK89B	0.000	20.0	20.0
FRP-090211-003	TK89C	0.000	20.0	20.0
PBW	TK89MB1	0.000	20.0	20.0
LCSW	TK89MB1SPK	0.000	20.0	20.0

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: AMEC Geomatrix

PROJECT: FRP 2011 Shoreline I INSTRUMENT ID: CETAC MERCURY START DATE: 9/9/2011

SDG: TK89 RUNID: HG090901 METHOD: CVL END DATE: 9/9/2011

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	10583														X																
S20	S20	1.00	11012														X																
S50	S50	1.00	11040														X																
S100	S100	1.00	11064														X																
S200	S200	1.00	11092														X																
S400	S400	1.00	11120														X																
S1000	S1000	1.00	11145														X																
ICV	AICV	1.00	11185														X																
ICB	ICB	1.00	11213														X																
CCV	ACCV1	1.00	11241														X																
CCB	CCB1	1.00	11270														X																
CRA	CRA	1.00	11294														X																
ZZZZZZ	TK58MB1	1.00	11322																														
ZZZZZZ	TK58MB1SPK	1.00	11350																														
ZZZZZZ	TK58A	1.00	11374																														
ZZZZZZ	TK58ADUP	1.00	11402																														
ZZZZZZ	TK58ASPK	1.00	11431																														
ZZZZZZ	TK58B	1.00	11455																														
ZZZZZZ	TK58C	1.00	11483																														
ZZZZZZ	TK58D	1.00	11511																														
ZZZZZZ	TK58E	1.00	11540																														
CCV	ACCV2	1.00	11564														X																
CCB	CCB2	1.00	11593														X																
ZZZZZZ	TK58F	1.00	12021																														
PBW	TK89MB1	1.00	12045														X																
LCSW	TK89MB1SPK	1.00	12073														X																
FRP-090211-001	TK89A	1.00	12101														X																
FRP-090211-001D	TK89ADUP	1.00	12125														X																
FRP-090211-001S	TK89ASPK	1.00	12153														X																
FRP-090211-002	TK89B	1.00	12181														X																
FRP-090211-003	TK89C	1.00	12210														X																
ZZZZZZ	TK75MB1	1.00	12234																														
ZZZZZZ	TK75MB1SPK	1.00	12262																														
CCV	ACCV3	1.00	12291														X																
CCB	CCB3	1.00	12315														X																

FORM XIV

TK89:00103

General Chemistry Analysis
Report and Summary QC Forms

ARI Job ID: TK88, TK89

SAMPLE RESULTS-CONVENTIONALS
TK88-AMEC Geomatrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 09/07/11

Project: FRP 2011 Shoreline Investiga
Event: 8769
Date Sampled: 09/02/11
Date Received: 09/02/11

Client ID: FRP-090211-001
ARI ID: 11-19092 TK88A

Analyte	Date Batch	Method	Units	RL	Sample
pH	09/02/11 090211#1	EPA 150.1	std units	0.01	7.45

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
TK88-AMEC Geomatrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 09/07/11

Project: FRP 2011 Shoreline Investiga
Event: 8769
Date Sampled: 09/02/11
Date Received: 09/02/11

Client ID: FRP-090211-002
ARI ID: 11-19093 TK88B

Analyte	Date Batch	Method	Units	RL	Sample
pH	09/02/11 090211#1	EPA 150.1	std units	0.01	9.66

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
TK88-AMEC Geomatrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 09/07/11

Project: FRP 2011 Shoreline Investiga
Event: 8769
Date Sampled: 09/02/11
Date Received: 09/02/11

Client ID: FRP-090211-003
ARI ID: 11-19094 TK88C

Analyte	Date Batch	Method	Units	RL	Sample
pH	09/02/11 090211#1	EPA 150.1	std units	0.01	7.14

RL Analytical reporting limit
U Undetected at reported detection limit

LAB CONTROL RESULTS-CONVENTIONALS
TK88-AMEC Geomatrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 09/07/11

Project: FRP 2011 Shoreline Investiga
Event: 8769
Date Sampled: NA
Date Received: NA

Analyte/Method	QC ID	Date	Units	LCS	Spike Added	Recovery
pH EPA 150.1	ICVL	09/02/11	std units	7.02	7.00	0.02

pH is evaluated as the Absolute Difference between the values rather than Percent Recovery.

TK08: 00107A08

REPLICATE RESULTS-CONVENTIONALS
TK88-AMEC Geomatrix

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 09/07/11

Project: FRP 2011 Shoreline Investiga
Event: 8769
Date Sampled: 09/02/11
Date Received: 09/02/11

Analyte	Method	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: TK88A Client ID: FRP-090211-001						
pH	EPA 150.1	09/02/11	std units	7.45	7.46	0.01

pH is evaluated as the Absolute Difference between the values rather than Relative Percent Difference