

**DATA VALIDATION  
MOAB SITE  
MOAB, UTAH**

**May 3-11, 2004  
Water Sampling**

**MOAB, UTAH**  
**May 2004**

**DATA PACKAGE CONTENTS**

This data package includes the following information:

<u>Item No.</u>	<u>Description of Contents</u>
1.	<b>Site Hydrologist Summary.</b>
2.	<b>Data Assessment Summary</b> , which describes problems identified in the data validation process and summarizes the validator's findings.
3.	<b>Sampling Location Map.</b>
4.	<b>Field Activities Verification Checklist</b> , which verifies that field activities were done according to the work plan.
5.	<b>Database Printouts.</b> a. Water Quality Data. b. Water Level Data.
6.	<b>Sampling Trip Report.</b>

## Site Hydrologist Summary

**Site:** Moab, Utah

**Sampling Period:** Water samples were collected at selected ground water monitor wells and from the Colorado River during the period May 3-11, 2004. This sampling represents the first of three sampling rounds to be conducted in 2004. Sampling was conducted in accordance with the *Surface Water and Ground Water Monitoring Plan for the Moab, Utah Site* (DOE 2004).

### SUMMARY CRITERIA

- 1. Did concentrations in water from any domestic wells sampled exceed a ground water standard, primary drinking water standard, or health advisory?**

Domestic wells were not sampled during this event.

- 2. Were standards exceeded at any point-of-compliance wells?**

Point-of-compliance wells have not been established at the Moab site.

- 3. As a result of this sampling round, is there any indication of unexpected contaminated ground water movement?**

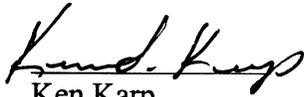
There is no indication of unexpected contaminated ground water movement. Ground water contamination in the shallow alluvial aquifer beneath the tailings pile and former mill site area flows to the southeast toward the Colorado River. This ground water movement is consistent with the site conceptual model as described in the Site Observation Work Plan (DOE 2003). Wells and surface locations that exceed water quality standards are listed in Table. 1.

- 4. Is there statistical evidence that UMTRA Project related contaminants were detected in a surface body of water in greater concentrations than upstream ambient water quality?**

Several analytes, including ammonia, chloride, sulfate, total dissolved solids, and uranium occur at elevated concentrations in the Colorado River. These elevated concentrations are found primarily adjacent to and just downstream from the mill tailing pile (i.e., surface location areas 0221 – 0225). The elevated concentrations decrease rapidly downstream and generally return to background levels at location 228.

*Table 1. Wells / Surface sites where Standards were Exceeded in May 2004.*

Analyte	Standard (mg/L)	Wells / Surface Sites Exceeding Standards
Uranium- Total	0.044	0223 (0.094), 0224 (0.160), 0229 (1.80), 0401 (2.1), 0402 (2.6), 0403 (2.6), 0404 (2.1), 0405 (1.3), 0406 (1.3), 0407 (3.1), 0408 (2.8), 0437 (2.9), 0439 (0.86), 0492 (5.5), ATP-2-D (0.14), ATP-2-S (1.8), TP-02 (12)

  
 Ken Karp  
 Site Lead

7-28-04  
 Date

# **DATA ASSESSMENT SUMMARY**

**MOAB, UTAH  
MAY 2004 SAMPLING EVENT  
DATA ASSESSMENT SUMMARY**

Paragon Analytics analyzed samples and reported results for this sampling event under requisition number 04030050 and work order number 0405052. Samples were analyzed for metals and inorganics (see Table 1 for specific analytes).

Table 1. Analytes and Methods

Analyte	LIC	Prep Method	Analytical Method
Uranium	GJO-01	SW-846 3005A	SW-846 6020
Chloride	MIS-A-039	SW-846 9056	SW-846 9056
Sulfate	WCH-A-044	SW-846 9056	SW-846 9056
Ammonia-N	WCH-A-005	NA	MCAWW 350.1
Total Dissolved Solids	WCH-A-033	NA	MCAWW 160.1

Table 2. Data Qualifiers (see following sections for detailed explanations)

Sample Number(s)	Analyte(s)	Flag	Reason
TP-02	Uranium	J	Matrix spike failure
0402	Uranium	J	Serial dilution failure

Calibration

*Sample Shipping/Receiving*

Sample shipments were received at Paragon Analytics accompanied by Chain of Custody (COC) on May 6, 8, and 14, 2004. The COC was checked to confirm that signatures and dates are present indicating sample relinquishment and receipt. The sample tickets were correctly filled out. The sample time for sample 0226 was listed as 16:00 on the COC but 18:00 on the sample bottles. The time from the COC was used.

*Holding Times and Preservation*

All sample shipments were received cool and intact. All samples had been preserved correctly for the requested analyses. All samples were analyzed within the applicable holding times.

*Method SW-846 6020*

Calibration was performed in accordance with the procedure for uranium on May 19, 2004. The initial calibration was performed using 4 calibration standards resulting in an  $r^2$  value greater

than 0.995. The absolute value of the intercept was less than 3 times the method detection limit (MDL). Calibration and laboratory spike standards were prepared from independent sources. Initial and continuing calibration checks were made at the required frequency, resulting in 10 continuing calibration verification samples (CCVs). All calibration checks met the acceptance criteria.

A reporting limit verification check (CRI) was made at the required frequency to verify the linearity of the calibration curve near the practical quantitation level. The CRI result was within the acceptance criteria.

The mass calibration and resolution was checked at the beginning of each analytical run in accordance with the procedure. Internal standard recoveries were stable and within acceptance ranges.

#### *Method SW-845 9056*

Calibrations were performed in accordance with the procedure. The initial calibration for anions was performed using 6 calibration standards, all of which were acceptable. Initial calibration and calibration check standards were prepared from independent sources and were made at the required frequency.

#### *Method MCAWW 350.1*

Six calibration standards were performed in accordance with the procedure and were within the acceptance criteria.

### Blanks

#### *Uranium*

All initial and continuing calibration blanks were below the practical quantitation limits. In cases where blank concentration exceeded the instrument detection limit, the associated sample results are flagged "U" when the sample result is greater than the IDL but less than 5 times the blank concentration.

#### *Inorganics*

All method and initial/continuing calibration blanks were below the detection limits.

### ICP Interference check sample (ICS) Analysis

ICP interference check samples ICSA and ICSAB were analyzed at the required frequency and all results met the acceptance criteria.

### Matrix Spike Analysis

#### *Uranium*

Three matrix spike and matrix spike duplicates (MS/MSD) were analyzed. Except as noted in Table 2, all acceptance criteria were met.

### *Inorganics*

Matrix spike and matrix spike duplicates were analyzed with NH<sub>3</sub>-N. All acceptance criteria were met.

### Laboratory Replicate Analysis

#### *Metals*

Matrix spike duplicates served as laboratory replicates for this RIN. The RPD values for all MSD samples were acceptable.

#### *Inorganics*

The precision criteria for the TDS duplicate were met. Matrix spike duplicates served as laboratory replicates for the other analytes.

### Laboratory Control Sample

The initial calibration verification served as laboratory control samples for undigested uranium samples. Laboratory control samples were analyzed at the correct frequency with acceptable results for all other analysis categories.

### Serial Dilution

A serial dilution was analyzed with each batch. With the exception of the sample noted in Table 2, all other acceptance criteria were met.

### Detection Limits/Dilutions

Samples were diluted in a consistent and acceptable manner when required.

### Completeness

Results were reported in correct units for all analytes requested. Appropriate contract-required laboratory qualifiers were used. Appropriate target analyte lists (TALs) were used, and the MDLs specified were met when possible.

### Other Quality Control

The integration of analytes peaks was reviewed for all ion chromatography data. There were no manual integrations performed and all peak integrations were satisfactory.

### EDD File

An EDD file arrived on May 6, 2004, and had incorrect entries for RINs and ticket numbers. A revised and correct EDD file arrived on May 7, 2004.

## Field Activities

All ground water results were qualified with an "F" flag in the database indicating the wells were purged and sampled using the low-flow sampling procedures.

Two equipment blanks were collected and analyzed for the same constituents as the Moab environmental samples. Concentrations measured in the equipment blanks were below their respective contract required detection limit; therefore equipment blank results are considered acceptable.

Three field duplicate samples were collected. Duplicate samples were collected from surface locations 0217 and 0224, and well TP-02. There are no established regulatory criteria for the evaluation of field duplicate samples; therefore, EPA guidance for *laboratory* duplicates (which is conservative for field duplicates) was used to assess the precision of the field duplicates. With the exception of the chloride and sulfate results from TP-02, all other data meet the laboratory duplicate criteria of  $\pm 20$  relative percent difference and are considered acceptable.

## Summary

All analytical quality control criteria were met except as qualified on the Ground Water Quality Data by Parameter, Surface Water Quality by Parameter, or equipment/trip blank database printouts. The meaning of data qualifiers is defined on the database printouts or defined in the USEPA Contract Laboratory Program Statement of Work for Inorganic Analysis, Multi-Media Multi-Concentration, Document Number ILMO2.0, 1991. All data in this package are considered validated and may be treated as final results.

  
\_\_\_\_\_  
Jeff Price  
Data Validation Lead

  
\_\_\_\_\_  
Date

# **FIELD VERIFICATION CHECKLIST**

# Water Sampling Field Activities Verification Checklist

Project	Moab, Utah	Date(s) of Water Sampling	May 3 – 11, 2004
Date(s) of Verification	06/28/04	Name of Verifier	Jeff Price

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures? List other documents, SOP's, instructions.	Yes	Work Request.
2. Were the sampling locations specified in the planning documents sampled?	Yes	
3. Was a pre-trip calibration conducted as specified in the above named documents?	Yes	
4. Was an operational check of the field equipment conducted twice daily? Did the operational checks meet criteria?	Yes	
5. Were the number and types (alkalinity, temperature, Ec, pH, turbidity, DO, ORP) of field measurements taken as specified?	Yes	
6. Was the Category of the well documented?	Yes	
7. Were the following conditions met when purging a Category I well: Was one pump/tubing volume purged prior to sampling?	Yes	
Did the water level stabilize prior to sampling?	Yes	
Did pH, specific conductance, and turbidity measurements stabilize prior to sampling?	Yes	
Was the flow rate less than 500 mL/min?	Yes	
If a portable pump was used, was there a 4 hour delay between pump installation and sampling?	NA	

## Water Sampling Field Activities Verification Checklist (continued)

8. Were the following conditions met when purging a Category II well:

Was the flow rate less than 500 mL/min?

NA

Was one pump/tubing volume removed prior to sampling?

9. Were duplicates taken at a frequency of one per 20 samples?

Yes

10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?

Yes

11. Were trip blanks prepared and included with each shipment of VOC samples?

NA

12. Were QC samples assigned a fictitious site identification number?

Yes

Was the true identity of the samples recorded on the Quality Assurance Sample Log?

Yes

13. Were samples collected in the containers specified?

Yes

14. Were samples filtered and preserved as specified?

Yes

15. Were the number and types of samples collected as specified?

Yes

16. Were chain of custody records completed and was sample custody maintained?

Yes

17. Are field data sheets signed and dated by both team members?

Yes

18. Was all other pertinent information documented on the field data sheets?

Yes

19. Was the presence or absence of ice in the cooler documented at every sample location?

Yes

20. Were water levels measured at the locations specified in the planning documents?

Yes

# **WATER QUALITY DATA**

GROUND WATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE MOA01, Moab Disposal Site  
 REPORT DATE: 7/16/2004 3:20 pm

PARAMETER	UNITS	LOCATION ID	LOCATION TYPE	SAMPLE:		DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS:			UN-CERTAINTY
				DATE	ID			LAB	DATA	QA	
Alkalinity, Total (As CaCO3)	mg/L	0401	WL	05/06/2004	0001	16.16 - 16.16	827	F	#	-	-
	mg/L	0402	WL	05/05/2004	0001	16.60 - 16.60	844	F	#	-	-
	mg/L	0403	WL	05/05/2004	0001	16.50 - 16.50	737	F	#	-	-
	mg/L	0404	WL	05/06/2004	0001	16.45 - 16.45	803	F	#	-	-
	mg/L	0405	WL	05/06/2004	0001	18.29 - 18.29	673	F	#	-	-
	mg/L	0406	WL	05/06/2004	0001	16.29 - 16.29	583	F	#	-	-
	mg/L	0407	WL	05/05/2004	0001	16.50 - 16.50	872	F	#	-	-
	mg/L	0408	WL	05/06/2004	0001	26.20 - 26.20	1004	F	#	-	-
	mg/L	0437	WL	05/11/2004	0001	98.30 - 98.30	598	F	#	-	-
	mg/L	0439	WL	05/11/2004	0001	118.30 - 118.30	752	F	#	-	-
	mg/L	0492	WL	05/05/2004	0001	17.96 - 17.96	1030	F	#	-	-
	mg/L	ATP-2-D	WL	05/11/2004	0001	88.00 - 88.00	134	F	#	-	-
	mg/L	ATP-2-S	WL	05/11/2004	0001	36.00 - 36.00	582	F	#	-	-
	mg/L	TP-02	WL	05/11/2004	0001	30.00 - 30.00	554	F	#	-	-
	mg/L	TP-17	WL	05/04/2004	0001	30.00 - 30.00	155	F	#	-	-
	mg/L	TP-18	WL	05/04/2004	0001	22.00 - 22.00	163	F	#	-	-
	mg/L	TP-19	WL	05/04/2004	0001	30.00 - 30.00	198	F	#	-	-
Ammonia Total as N	mg/L	0401	WL	05/06/2004	0001	16.16 - 16.16	480	F	#	20	-
	mg/L	0402	WL	05/05/2004	0001	16.60 - 16.60	420	F	#	20	-
	mg/L	0403	WL	05/05/2004	0001	16.50 - 16.50	370	F	#	10	-
	mg/L	0404	WL	05/06/2004	0001	16.45 - 16.45	340	F	#	10	-
	mg/L	0405	WL	05/06/2004	0001	18.29 - 18.29	390	F	#	10	-
	mg/L	0406	WL	05/06/2004	0001	16.29 - 16.29	400	F	#	10	-
	mg/L	0407	WL	05/05/2004	0001	16.50 - 16.50	690	F	#	20	-
	mg/L	0408	WL	05/06/2004	0001	26.20 - 26.20	930	F	#	20	-
	mg/L	0437	WL	05/11/2004	0001	98.30 - 98.30	0.1	U	F	#	0.1

GROUND WATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE MOA01, Moab Disposal Site  
 REPORT DATE: 7/16/2004 3:20 pm

PARAMETER	UNITS	LOCATION ID	LOCATION TYPE	SAMPLE:		DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS:			DETECTION LIMIT	UN-CERTAINTY
				DATE	ID			LAB	DATA	QA		
Ammonia Total as N	mg/L	0439	WL	05/11/2004	0001	118.30 - 118.30	12	F	#	1	-	
	mg/L	0492	WL	05/05/2004	0001	17.96 - 17.96	70	F	#	2	-	
	mg/L	ATP-2-D	WL	05/11/2004	0001	88.00 - 88.00	440	F	#	10	-	
	mg/L	ATP-2-S	WL	05/11/2004	0001	36.00 - 36.00	300	F	#	10	-	
	mg/L	TP-02	WL	05/11/2004	0001	30.00 - 30.00	1.1	F	#	0.1	-	
	mg/L	TP-02	WL	05/11/2004	0002	30.00 - 30.00	1	F	#	0.1	-	
	mg/L	TP-17	WL	05/04/2004	0001	30.00 - 30.00	2.8	F	#	0.1	-	
	mg/L	TP-18	WL	05/04/2004	0001	22.00 - 22.00	3.1	F	#	0.1	-	
	mg/L	TP-19	WL	05/04/2004	0001	30.00 - 30.00	3.2	F	#	0.1	-	
Chloride	mg/L	0401	WL	05/06/2004	0001	16.16 - 16.16	1900	F	#	100	-	
	mg/L	0402	WL	05/05/2004	0001	16.60 - 16.60	2100	F	#	100	-	
	mg/L	0403	WL	05/05/2004	0001	16.50 - 16.50	3000	F	#	100	-	
	mg/L	0404	WL	05/06/2004	0001	16.45 - 16.45	2000	F	#	100	-	
	mg/L	0405	WL	05/06/2004	0001	18.29 - 18.29	1300	F	#	100	-	
	mg/L	0406	WL	05/06/2004	0001	16.29 - 16.29	810	F	#	100	-	
	mg/L	0407	WL	05/05/2004	0001	16.50 - 16.50	4900	F	#	200	-	
	mg/L	0408	WL	05/06/2004	0001	26.20 - 26.20	2700	F	#	100	-	
	mg/L	0437	WL	05/11/2004	0001	98.30 - 98.30	1400	F	#	20	-	
	mg/L	0439	WL	05/11/2004	0001	118.30 - 118.30	1100	F	#	20	-	
	mg/L	0492	WL	05/05/2004	0001	17.96 - 17.96	11000	F	#	200	-	
	mg/L	ATP-2-D	WL	05/11/2004	0001	88.00 - 88.00	52000	F	#	1000	-	
	mg/L	ATP-2-S	WL	05/11/2004	0001	36.00 - 36.00	4400	F	#	100	-	
	mg/L	TP-02	WL	05/11/2004	0001	30.00 - 30.00	460	F	#	10	-	
	mg/L	TP-02	WL	05/11/2004	0002	30.00 - 30.00	230	F	#	10	-	
	mg/L	TP-17	WL	05/04/2004	0001	30.00 - 30.00	58000	F	#	1000	-	
	mg/L	TP-18	WL	05/04/2004	0001	22.00 - 22.00	63000	F	#	1000	-	

GROUND WATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE MOA01, Moab Disposal Site  
 REPORT DATE: 7/16/2004 3:20 pm

PARAMETER	UNITS	LOCATION ID	LOCATION TYPE	SAMPLE:		DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS:			DETECTION LIMIT	UN-CERTAINTY
				DATE	ID			LAB	DATA	QA		
Chloride	mg/L	TP-19	WL	05/04/2004	0001	30.00 - 30.00	62000	F	#	1000	-	
Dissolved Oxygen	mg/L	TP-18	WL	05/04/2004	N001	22.00 - 22.00	-0.8	F	#	-	-	
Oxidation Reduction Potent	mV	0401	WL	05/06/2004	N001	16.16 - 16.16	219	F	#	-	-	
	mV	0402	WL	05/05/2004	N001	16.60 - 16.60	218	F	#	-	-	
	mV	0403	WL	05/05/2004	N001	16.50 - 16.50	195	F	#	-	-	
	mV	0404	WL	05/06/2004	N001	16.45 - 16.45	222	F	#	-	-	
	mV	0405	WL	05/06/2004	N001	18.29 - 18.29	236	F	#	-	-	
	mV	0406	WL	05/06/2004	N001	16.29 - 16.29	229	F	#	-	-	
	mV	0407	WL	05/05/2004	N001	16.50 - 16.50	205	F	#	-	-	
	mV	0408	WL	05/06/2004	N001	26.20 - 26.20	208	F	#	-	-	
	mV	0437	WL	05/11/2004	N001	98.30 - 98.30	176	F	#	-	-	
	mV	0439	WL	05/11/2004	N001	118.30 - 118.30	211	F	#	-	-	
	mV	0492	WL	05/05/2004	N001	17.96 - 17.96	-82	F	#	-	-	
	mV	ATP-2-D	WL	05/11/2004	N001	88.00 - 88.00	-220	F	#	-	-	
	mV	ATP-2-S	WL	05/11/2004	N001	36.00 - 36.00	-163	F	#	-	-	
	mV	TP-02	WL	05/11/2004	N001	30.00 - 30.00	-19	F	#	-	-	
	mV	TP-17	WL	05/04/2004	N001	30.00 - 30.00	-109.5	F	#	-	-	
	mV	TP-18	WL	05/04/2004	N001	22.00 - 22.00	-108.1	F	#	-	-	
mV	TP-19	WL	05/04/2004	N001	30.00 - 30.00	-295	F	#	-	-		
pH	s.u.	0401	WL	05/06/2004	N001	16.16 - 16.16	6.70	F	#	-	-	
	s.u.	0402	WL	05/05/2004	N001	16.60 - 16.60	6.63	F	#	-	-	
	s.u.	0403	WL	05/05/2004	N001	16.50 - 16.50	6.61	F	#	-	-	
	s.u.	0404	WL	05/06/2004	N001	16.45 - 16.45	6.72	F	#	-	-	
	s.u.	0405	WL	05/06/2004	N001	18.29 - 18.29	6.64	F	#	-	-	
	s.u.	0406	WL	05/06/2004	N001	16.29 - 16.29	6.79	F	#	-	-	
	s.u.	0407	WL	05/05/2004	N001	16.50 - 16.50	6.71	F	#	-	-	

GROUND WATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE MOA01, Moab Disposal Site  
 REPORT DATE: 7/16/2004 3:20 pm

PARAMETER	UNITS	LOCATION ID	LOCATION TYPE	SAMPLE:		DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS:			DETECTION LIMIT	UN-CERTAINTY
				DATE	ID			LAB	DATA	QA		
pH	s.u.	0408	WL	05/06/2004	N001	26.20 - 26.20	6.79	F	#	-	-	
	s.u.	0437	WL	05/11/2004	N001	98.30 - 98.30	7.36	F	#	-	-	
	s.u.	0439	WL	05/11/2004	N001	118.30 - 118.30	6.84	F	#	-	-	
	s.u.	0492	WL	05/05/2004	N001	17.96 - 17.96	6.95	F	#	-	-	
	s.u.	ATP-2-D	WL	05/11/2004	N001	88.00 - 88.00	7.48	F	#	-	-	
	s.u.	ATP-2-S	WL	05/11/2004	N001	36.00 - 36.00	7.29	F	#	-	-	
	s.u.	TP-02	WL	05/11/2004	N001	30.00 - 30.00	7.16	F	#	-	-	
	s.u.	TP-17	WL	05/04/2004	N001	30.00 - 30.00	7.05	F	#	-	-	
	s.u.	TP-18	WL	05/04/2004	N001	22.00 - 22.00	7.08	F	#	-	-	
	s.u.	TP-19	WL	05/04/2004	N001	30.00 - 30.00	6.81	F	#	-	-	
Specific Conductance	umhos/cm	0401	WL	05/06/2004	N001	16.16 - 16.16	17670	F	#	-	-	
	umhos/cm	0402	WL	05/05/2004	N001	16.60 - 16.60	18090	F	#	-	-	
	umhos/cm	0403	WL	05/05/2004	N001	16.50 - 16.50	19460	F	#	-	-	
	umhos/cm	0404	WL	05/06/2004	N001	16.45 - 16.45	18180	F	#	-	-	
	umhos/cm	0405	WL	05/06/2004	N001	18.29 - 18.29	15220	F	#	-	-	
	umhos/cm	0406	WL	05/06/2004	N001	16.29 - 16.29	14210	F	#	-	-	
	umhos/cm	0407	WL	05/05/2004	N001	16.50 - 16.50	26930	F	#	-	-	
	umhos/cm	0408	WL	05/06/2004	N001	26.20 - 26.20	24570	F	#	-	-	
	umhos/cm	0437	WL	05/11/2004	N001	98.30 - 98.30	11200	F	#	-	-	
	umhos/cm	0439	WL	05/11/2004	N001	118.30 - 118.30	9135	F	#	-	-	
	umhos/cm	0492	WL	05/05/2004	N001	17.96 - 17.96	45330	F	#	-	-	
	umhos/cm	ATP-2-D	WL	05/11/2004	N001	88.00 - 88.00	117900	F	#	-	-	
	umhos/cm	ATP-2-S	WL	05/11/2004	N001	36.00 - 36.00	20230	F	#	-	-	
	umhos/cm	TP-02	WL	05/11/2004	N001	30.00 - 30.00	4467	F	#	-	-	
	umhos/cm	TP-17	WL	05/04/2004	N001	30.00 - 30.00	123800	F	#	-	-	
	umhos/cm	TP-18	WL	05/04/2004	N001	22.00 - 22.00	132400	F	#	-	-	

GROUND WATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE MOA01, Moab Disposal Site  
 REPORT DATE: 7/16/2004 3:20 pm

PARAMETER	UNITS	LOCATION ID	LOCATION TYPE	SAMPLE:		DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS:			UN-CERTAINTY
				DATE	ID			LAB	DATA	QA	
Specific Conductance	umhos/cm	TP-19	WL	05/04/2004	N001	30.00 - 30.00	132400	F	#	-	-
Sulfate	mg/L	0401	WL	05/06/2004	0001	16.16 - 16.16	7700	F	#	250	-
	mg/L	0402	WL	05/05/2004	0001	16.60 - 16.60	7800	F	#	250	-
	mg/L	0403	WL	05/05/2004	0001	16.50 - 16.50	7300	F	#	250	-
	mg/L	0404	WL	05/06/2004	0001	16.45 - 16.45	7800	F	#	250	-
	mg/L	0405	WL	05/06/2004	0001	18.29 - 18.29	7000	F	#	250	-
	mg/L	0406	WL	05/06/2004	0001	16.29 - 16.29	6400	F	#	250	-
	mg/L	0407	WL	05/05/2004	0001	16.50 - 16.50	9400	F	#	500	-
	mg/L	0408	WL	05/06/2004	0001	26.20 - 26.20	12000	F	#	250	-
	mg/L	0437	WL	05/11/2004	0001	98.30 - 98.30	3900	F	#	50	-
	mg/L	0439	WL	05/11/2004	0001	118.30 - 118.30	3600	F	#	50	-
	mg/L	0492	WL	05/05/2004	0001	17.96 - 17.96	15000	F	#	250	-
	mg/L	ATP-2-D	WL	05/11/2004	0001	88.00 - 88.00	5100	F	#	500	-
	mg/L	ATP-2-S	WL	05/11/2004	0001	36.00 - 36.00	6800	F	#	100	-
	mg/L	TP-02	WL	05/11/2004	0001	30.00 - 30.00	1400	F	#	25	-
	mg/L	TP-02	WL	05/11/2004	0002	30.00 - 30.00	680	F	#	25	-
	mg/L	TP-17	WL	05/04/2004	0001	30.00 - 30.00	4500	F	#	500	-
	mg/L	TP-18	WL	05/04/2004	0001	22.00 - 22.00	4800	F	#	500	-
	mg/L	TP-19	WL	05/04/2004	0001	30.00 - 30.00	4500	F	#	500	-
Temperature	C	0401	WL	05/06/2004	N001	16.16 - 16.16	15.33	F	#	-	-
	C	0402	WL	05/05/2004	N001	16.60 - 16.60	17.37	F	#	-	-
	C	0403	WL	05/05/2004	N001	16.50 - 16.50	17.06	F	#	-	-
	C	0404	WL	05/06/2004	N001	16.45 - 16.45	16.48	F	#	-	-
	C	0405	WL	05/06/2004	N001	18.29 - 18.29	17.32	F	#	-	-
	C	0406	WL	05/06/2004	N001	16.29 - 16.29	18.72	F	#	-	-
	C	0407	WL	05/05/2004	N001	16.50 - 16.50	18.49	F	#	-	-

GROUND WATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE MOA01, Moab Disposal Site  
 REPORT DATE: 7/16/2004 3:20 pm

PARAMETER	UNITS	LOCATION ID	LOCATION TYPE	SAMPLE:		DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS:			UN-CERTAINTY
				DATE	ID			LAB	DATA	QA	
Temperature	C	0408	WL	05/06/2004	N001	26.20 - 26.20	16.78	F	#	-	-
	C	0437	WL	05/11/2004	N001	98.30 - 98.30	16.99	F	#	-	-
	C	0439	WL	05/11/2004	N001	118.30 - 118.30	16.68	F	#	-	-
	C	0492	WL	05/05/2004	N001	17.96 - 17.96	17.39	F	#	-	-
	C	ATP-2-D	WL	05/11/2004	N001	88.00 - 88.00	17.48	F	#	-	-
	C	ATP-2-S	WL	05/11/2004	N001	36.00 - 36.00	18.02	F	#	-	-
	C	TP-02	WL	05/11/2004	N001	30.00 - 30.00	15.67	F	#	-	-
	C	TP-17	WL	05/04/2004	N001	30.00 - 30.00	16.85	F	#	-	-
	C	TP-18	WL	05/04/2004	N001	22.00 - 22.00	17.22	F	#	-	-
	C	TP-19	WL	05/04/2004	N001	30.00 - 30.00	15.53	F	#	-	-
Total Dissolved Solids	mg/L	0401	WL	05/06/2004	0001	16.16 - 16.16	14000	F	#	400	-
	mg/L	0402	WL	05/05/2004	0001	16.60 - 16.60	14000	F	#	400	-
	mg/L	0403	WL	05/05/2004	0001	16.50 - 16.50	15000	F	#	400	-
	mg/L	0404	WL	05/06/2004	0001	16.45 - 16.45	15000	F	#	400	-
	mg/L	0405	WL	05/06/2004	0001	18.29 - 18.29	12000	F	#	400	-
	mg/L	0406	WL	05/06/2004	0001	16.29 - 16.29	11000	F	#	400	-
	mg/L	0407	WL	05/05/2004	0001	16.50 - 16.50	19000	F	#	400	-
	mg/L	0408	WL	05/06/2004	0001	26.20 - 26.20	20000	F	#	400	-
	mg/L	0437	WL	05/11/2004	0001	98.30 - 98.30	8600	F	#	200	-
	mg/L	0439	WL	05/11/2004	0001	118.30 - 118.30	7800	F	#	200	-
	mg/L	0492	WL	05/05/2004	0001	17.96 - 17.96	40000	F	#	1000	-
	mg/L	ATP-2-D	WL	05/11/2004	0001	88.00 - 88.00	91000	F	#	2000	-
	mg/L	ATP-2-S	WL	05/11/2004	0001	36.00 - 36.00	17000	F	#	400	-
	mg/L	TP-02	WL	05/11/2004	0001	30.00 - 30.00	3400	F	#	80	-
	mg/L	TP-02	WL	05/11/2004	0002	30.00 - 30.00	3400	F	#	80	-
	mg/L	TP-17	WL	05/04/2004	0001	30.00 - 30.00	95000	F	#	2000	-

GROUND WATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE MOA01, Moab Disposal Site  
 REPORT DATE: 7/16/2004 3:20 pm

PARAMETER	UNITS	LOCATION ID	LOCATION TYPE	SAMPLE:		DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS:			UN-CERTAINTY	
				DATE	ID			LAB	DATA	QA		DETECTION LIMIT
Total Dissolved Solids	mg/L	TP-18	WL	05/04/2004	0001	22.00 - 22.00	100000	F	#	2000	-	
	mg/L	TP-19	WL	05/04/2004	0001	30.00 - 30.00	100000	F	#	2000	-	
Turbidity	NTU	0401	WL	05/06/2004	N001	16.16 - 16.16	2.85	F	#	-	-	
	NTU	0402	WL	05/05/2004	N001	16.60 - 16.60	4.57	F	#	-	-	
	NTU	0403	WL	05/05/2004	N001	16.50 - 16.50	7.49	F	#	-	-	
	NTU	0404	WL	05/06/2004	N001	16.45 - 16.45	3.79	F	#	-	-	
	NTU	0405	WL	05/06/2004	N001	18.29 - 18.29	7.65	F	#	-	-	
	NTU	0406	WL	05/06/2004	N001	16.29 - 16.29	8.84	F	#	-	-	
	NTU	0407	WL	05/05/2004	N001	16.50 - 16.50	1.99	F	#	-	-	
	NTU	0408	WL	05/06/2004	N001	26.20 - 26.20	7.79	F	#	-	-	
	NTU	0437	WL	05/11/2004	N001	98.30 - 98.30	6.61	F	#	-	-	
	NTU	0439	WL	05/11/2004	N001	118.30 - 118.30	2.07	F	#	-	-	
	NTU	0492	WL	05/05/2004	N001	17.96 - 17.96	8.77	F	#	-	-	
	NTU	ATP-2-D	WL	05/11/2004	N001	88.00 - 88.00	9.08	F	#	-	-	
	NTU	ATP-2-S	WL	05/11/2004	N001	36.00 - 36.00	8.63	F	#	-	-	
	NTU	TP-02	WL	05/11/2004	N001	30.00 - 30.00	4.96	F	#	-	-	
	NTU	TP-17	WL	05/04/2004	N001	30.00 - 30.00	8.47	F	#	-	-	
	NTU	TP-18	WL	05/04/2004	N001	22.00 - 22.00	11.3	F	#	-	-	
NTU	TP-19	WL	05/04/2004	N001	30.00 - 30.00	7.49	F	#	-	-		
Uranium	mg/L	0401	WL	05/06/2004	0001	16.16 - 16.16	2.100	F	#	0.01	-	
	mg/L	0402	WL	05/05/2004	0001	16.60 - 16.60	2.600	E	JF	#	0.01	-
	mg/L	0403	WL	05/05/2004	0001	16.50 - 16.50	2.600	F	#	0.01	-	
	mg/L	0404	WL	05/06/2004	0001	16.45 - 16.45	2.100	F	#	0.01	-	
	mg/L	0405	WL	05/06/2004	0001	18.29 - 18.29	1.300	F	#	0.01	-	
	mg/L	0406	WL	05/06/2004	0001	16.29 - 16.29	1.300	F	#	0.01	-	
	mg/L	0407	WL	05/05/2004	0001	16.50 - 16.50	3.100	F	#	0.01	-	

GROUND WATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE MOA01, Moab Disposal Site  
 REPORT DATE: 7/16/2004 3:20 pm

PARAMETER	UNITS	LOCATION ID	LOCATION TYPE	SAMPLE:		DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS:			DETECTION LIMIT	UN-CERTAINTY
				DATE	ID			LAB	DATA	QA		
Uranium	mg/L	0408	WL	05/06/2004	0001	26.20 - 26.20	2.800	F	#		0.01	-
	mg/L	0437	WL	05/11/2004	0001	98.30 - 98.30	2.900	F	#		0.01	-
	mg/L	0439	WL	05/11/2004	0001	118.30 - 118.30	0.860	F	#		0.01	-
	mg/L	0492	WL	05/05/2004	0001	17.96 - 17.96	5.500	F	#		0.01	-
	mg/L	ATP-2-D	WL	05/11/2004	0001	88.00 - 88.00	0.140	F	#		0.001	-
	mg/L	ATP-2-S	WL	05/11/2004	0001	36.00 - 36.00	1.800	F	#		0.01	-
	mg/L	TP-02	WL	05/11/2004	0001	30.00 - 30.00	12.000	N	JF	#	0.02	-
	mg/L	TP-02	WL	05/11/2004	0002	30.00 - 30.00	11.000		F	#	0.02	-
	mg/L	TP-17	WL	05/04/2004	0001	30.00 - 30.00	0.0071		F	#	0.0001	-
	mg/L	TP-18	WL	05/04/2004	0001	22.00 - 22.00	0.018		F	#	0.0001	-
	mg/L	TP-19	WL	05/04/2004	0001	30.00 - 30.00	0.00015	B	F	#	0.0005	-

GROUND WATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE MOA01, Moab Disposal Site  
 REPORT DATE: 7/16/2004 3:20 pm

PARAMETER	UNITS	LOCATION ID	LOCATION TYPE	SAMPLE: DATE	SAMPLE: ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
-----------	-------	-------------	---------------	--------------	------------	----------------------	--------	-------------------------	-----------------	--------------

RECORDS: SELECTED FROM USEE200 WHERE site\_code='MOA01' AND quality\_assurance = TRUE AND (data\_validation\_qualifiers IS NULL OR data\_validation\_qualifiers NOT LIKE '%R%' AND data\_validation\_qualifiers NOT LIKE '%X%') AND DATE\_SAMPLED between #5/1/2004# and #5/16/2004#

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

LOCATION TYPES: WL WELL

LAB QUALIFIERS:

- \* Replicate analysis not within control limits.
- + Correlation coefficient for MSA < 0.995.
- > Result above upper detection limit.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
- C Pesticide result confirmed by GC-MS.
- D Analyte determined in diluted sample.
- E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- J Estimated
- M GFAA duplicate injection precision not met.
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
- P > 25% difference in detected pesticide or Arochlor concentrations between 2 columns.
- S Result determined by method of standard addition (MSA).
- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- X Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- Y Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- Z Laboratory defined (USEPA CLP organic) qualifier, see case narrative.

DATA QUALIFIERS:

- |                                                      |                                                |                    |
|------------------------------------------------------|------------------------------------------------|--------------------|
| F Low flow sampling method used.                     | G Possible grout contamination, pH > 9.        | J Estimated value. |
| L Less than 3 bore volumes purged prior to sampling. | Q Qualitative result due to sampling technique | R Unusable result. |
| U Parameter analyzed for but was not detected.       | X Location is undefined.                       |                    |

QA QUALIFIER: # = validated according to Quality Assurance guidelines.

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE MOA01, Moab Disposal Site  
 REPORT DATE: 7/16/2004 3:20 pm

PARAMETER	UNITS	LOCATION ID	SAMPLE:		RESULT	QUALIFIERS:			DETECTION LIMIT	UN- CERTAINTY	
			DATE	ID		LAB	DATA	QA			
Alkalinity, Total (As CaCO3	mg/L	0201	05/03/2004	0001	123				#	-	-
	mg/L	0204	05/11/2004	0001	85				#	-	-
	mg/L	0217	05/07/2004	0001	118				#	-	-
	mg/L	0219	05/06/2004	0001	119				#	-	-
	mg/L	0220	05/06/2004	0001	121				#	-	-
	mg/L	0221	05/06/2004	0001	120				#	-	-
	mg/L	0222	05/06/2004	0001	116				#	-	-
	mg/L	0223	05/05/2004	0001	154				#	-	-
	mg/L	0224	05/05/2004	0001	164				#	-	-
	mg/L	0225	05/05/2004	0001	127				#	-	-
	mg/L	0226	05/04/2004	0001	122				#	-	-
	mg/L	0227	05/04/2004	0001	121				#	-	-
	mg/L	0228	05/04/2004	0001	116				#	-	-
	mg/L	0229	05/04/2004	0001	661				#	-	-
	mg/L	0230	05/04/2004	0001	128				#	-	-
	mg/L	0231	05/04/2004	0001	124				#	-	-
	mg/L	0232	05/05/2004	0001	121				#	-	-
	mg/L	0233	05/05/2004	0001	124				#	-	-
	mg/L	0234	05/05/2004	0001	126				#	-	-
		mg/L	CR1	05/03/2004	0001	116				#	-
	mg/L	CR3	05/05/2004	0001	128				#	-	-
	mg/L	CR5	05/03/2004	0001	118				#	-	-
Ammonia Total as N	mg/L	0201	05/03/2004	0001	0.1	U			#	0.1	-
	mg/L	0204	05/11/2004	0001	0.1	U			#	0.1	-
	mg/L	0217	05/07/2004	0001	0.1	U			#	0.1	-
	mg/L	0217	05/07/2004	0002	0.1	U			#	0.1	-
	mg/L	0219	05/06/2004	0001	0.1	U			#	0.1	-
	mg/L	0220	05/06/2004	0001	0.1	U			#	0.1	-
	mg/L	0221	05/06/2004	0001	0.38				#	0.1	-
	mg/L	0222	05/06/2004	0001	0.34				#	0.1	-
	mg/L	0223	05/05/2004	0001	22				#	2	-
	mg/L	0224	05/05/2004	0001	30				#	2	-
	mg/L	0224	05/05/2004	0002	30				#	2	-
	mg/L	0225	05/05/2004	0001	4.3				#	0.1	-
	mg/L	0226	05/04/2004	0001	0.21				#	0.1	-
	mg/L	0227	05/04/2004	0001	0.18				#	0.1	-
	mg/L	0228	05/04/2004	0001	0.1				#	0.1	-
	mg/L	0229	05/04/2004	0001	320				#	10	-

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE MOA01, Moab Disposal Site  
 REPORT DATE: 7/16/2004 3:20 pm

PARAMETER	UNITS	LOCATION ID	SAMPLE:		RESULT	QUALIFIERS:			DETECTION LIMIT	UN- CERTAINTY
			DATE	ID		LAB	DATA	QA		
Ammonia Total as N	mg/L	0230	05/04/2004	0001	2.8			#	0.1	-
	mg/L	0231	05/04/2004	0001	0.47			#	0.1	-
	mg/L	0232	05/05/2004	0001	0.1			#	0.1	-
	mg/L	0233	05/05/2004	0001	0.32			#	0.1	-
	mg/L	0234	05/05/2004	0001	0.22			#	0.1	-
	mg/L	CR1	05/03/2004	0001	0.1	U		#	0.1	-
	mg/L	CR3	05/05/2004	0001	0.33			#	0.1	-
	mg/L	CR5	05/03/2004	0001	0.1	U		#	0.1	-
Chloride	mg/L	0201	05/03/2004	0001	74			#	2	-
	mg/L	0204	05/11/2004	0001	32			#	2	-
	mg/L	0217	05/07/2004	0001	62			#	2	-
	mg/L	0217	05/07/2004	0002	63			#	2	-
	mg/L	0219	05/06/2004	0001	67			#	2	-
	mg/L	0220	05/06/2004	0001	67			#	2	-
	mg/L	0221	05/06/2004	0001	66			#	2	-
	mg/L	0222	05/06/2004	0001	68			#	2	-
	mg/L	0223	05/05/2004	0001	160			#	4	-
	mg/L	0224	05/05/2004	0001	220			#	4	-
	mg/L	0224	05/05/2004	0002	220			#	4	-
	mg/L	0225	05/05/2004	0001	92			#	2	-
	mg/L	0226	05/04/2004	0001	75			#	2	-
	mg/L	0227	05/04/2004	0001	73			#	2	-
	mg/L	0228	05/04/2004	0001	71			#	2	-
	mg/L	0229	05/04/2004	0001	1400			#	20	-
	mg/L	0230	05/04/2004	0001	84			#	2	-
	mg/L	0231	05/04/2004	0001	70			#	2	-
	mg/L	0232	05/05/2004	0001	68			#	2	-
	mg/L	0233	05/05/2004	0001	69			#	2	-
	mg/L	0234	05/05/2004	0001	68			#	2	-
	mg/L	CR1	05/03/2004	0001	70			#	2	-
	mg/L	CR3	05/05/2004	0001	69			#	2	-
	mg/L	CR5	05/03/2004	0001	80			#	2	-
Dissolved Oxygen	mg/L	0201	05/03/2004	N001	8.09			#	-	-
	mg/L	0204	05/11/2004	N001	9.51			#	-	-
	mg/L	0217	05/07/2004	N001	7.55			#	-	-
	mg/L	0219	05/06/2004	N001	9.43			#	-	-
	mg/L	0220	05/06/2004	N001	9.88			#	-	-
	mg/L	0221	05/06/2004	N001	4.58			#	-	-

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE MOA01, Moab Disposal Site  
 REPORT DATE: 7/16/2004 3:20 pm

PARAMETER	UNITS	LOCATION ID	SAMPLE:		RESULT	QUALIFIERS: DETECTION UN-		
			DATE	ID		LAB DATA QA	LIMIT	CERTAINTY
Dissolved Oxygen	mg/L	0222	05/06/2004	N001	8.51	#	-	-
	mg/L	0223	05/05/2004	N001	9.78	#	-	-
	mg/L	0224	05/05/2004	N001	11.06	#	-	-
	mg/L	0225	05/05/2004	N001	9.90	#	-	-
	mg/L	0226	05/04/2004	N001	8.60	#	-	-
	mg/L	0227	05/04/2004	N001	8.84	#	-	-
	mg/L	0228	05/04/2004	N001	8.23	#	-	-
	mg/L	0229	05/04/2004	N001	15	#	-	-
	mg/L	0230	05/04/2004	N001	6.02	#	-	-
	mg/L	0231	05/04/2004	N001	8.89	#	-	-
	mg/L	0232	05/05/2004	N001	8.91	#	-	-
	mg/L	0233	05/05/2004	N001	8.80	#	-	-
	mg/L	0234	05/05/2004	N001	9.80	#	-	-
	mg/L	CR1	05/03/2004	N001	8.29	#	-	-
	mg/L	CR3	05/05/2004	N001	8.70	#	-	-
	mg/L	CR5	05/03/2004	N001	8.22	#	-	-
Oxidation Reduction Potent	mV	0201	05/03/2004	N001	219	#	-	-
	mV	0204	05/11/2004	N001	177	#	-	-
	mV	0217	05/07/2004	N001	179.2	#	-	-
	mV	0219	05/06/2004	N001	161	#	-	-
	mV	0220	05/06/2004	N001	193	#	-	-
	mV	0221	05/06/2004	N001	177	#	-	-
	mV	0222	05/06/2004	N001	144	#	-	-
	mV	0223	05/05/2004	N001	116	#	-	-
	mV	0224	05/05/2004	N001	135	#	-	-
	mV	0225	05/05/2004	N001	180	#	-	-
	mV	0226	05/04/2004	N001	99.6	#	-	-
	mV	0227	05/04/2004	N001	86.3	#	-	-
	mV	0228	05/04/2004	N001	-55.5	#	-	-
	mV	0229	05/04/2004	N001	113	#	-	-
	mV	0230	05/04/2004	N001	96	#	-	-
	mV	0231	05/04/2004	N001	108	#	-	-
	mV	0232	05/05/2004	N001	745	#	-	-
	mV	0233	05/05/2004	N001	111	#	-	-
	mV	0234	05/05/2004	N001	151	#	-	-
	mV	CR1	05/03/2004	N001	243	#	-	-
mV	CR3	05/05/2004	N001	118	#	-	-	
mV	CR5	05/03/2004	N001	205	#	-	-	

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE MOA01, Moab Disposal Site  
 REPORT DATE: 7/16/2004 3:20 pm

PARAMETER	UNITS	LOCATION ID	SAMPLE:		RESULT	QUALIFIERS: DETECTION UN-			
			DATE	ID		LAB DATA QA	LIMIT	CERTAINTY	
pH	s.u.	0201	05/03/2004	N001	8.32		#	-	-
	s.u.	0204	05/11/2004	N001	7.85		#	-	-
	s.u.	0217	05/07/2004	N001	8.33		#	-	-
	s.u.	0219	05/06/2004	N001	8.42		#	-	-
	s.u.	0220	05/06/2004	N001	8.41		#	-	-
	s.u.	0221	05/06/2004	N001	8.47		#	-	-
	s.u.	0222	05/06/2004	N001	8.45		#	-	-
	s.u.	0223	05/05/2004	N001	8.24		#	-	-
	s.u.	0224	05/05/2004	N001	8.18		#	-	-
	s.u.	0225	05/05/2004	N001	8.31		#	-	-
	s.u.	0226	05/04/2004	N001	8.36		#	-	-
	s.u.	0227	05/04/2004	N001	8.37		#	-	-
	s.u.	0228	05/04/2004	N001	8.45		#	-	-
	s.u.	0229	05/04/2004	N001	7.59		#	-	-
	s.u.	0230	05/04/2004	N001	8.31		#	-	-
	s.u.	0231	05/04/2004	N001	8.34		#	-	-
	s.u.	0232	05/05/2004	N001	8.43		#	-	-
	s.u.	0233	05/05/2004	N001	8.41		#	-	-
	s.u.	0234	05/05/2004	N001	8.51		#	-	-
		s.u.	CR1	05/03/2004	N001	8.32		#	-
	s.u.	CR3	05/05/2004	N001	8.41		#	-	-
	s.u.	CR5	05/03/2004	N001	8.32		#	-	-
Specific Conductance	umhos/cm	0201	05/03/2004	N001	1000		#	-	-
	umhos/cm	0204	05/11/2004	N001	497		#	-	-
	umhos/cm	0217	05/07/2004	N001	818		#	-	-
	umhos/cm	0219	05/06/2004	N001	888		#	-	-
	umhos/cm	0220	05/06/2004	N001	892		#	-	-
	umhos/cm	0221	05/06/2004	N001	980		#	-	-
	umhos/cm	0222	05/06/2004	N001	917		#	-	-
	umhos/cm	0223	05/05/2004	N001	1875		#	-	-
	umhos/cm	0224	05/05/2004	N001	2684		#	-	-
	umhos/cm	0225	05/05/2004	N001	1239		#	-	-
	umhos/cm	0226	05/04/2004	N001	916		#	-	-
	umhos/cm	0227	05/04/2004	N001	903		#	-	-
	umhos/cm	0228	05/04/2004	N001	883		#	-	-
	umhos/cm	0229	05/04/2004	N001	4860		#	-	-
	umhos/cm	0230	05/04/2004	N001	1059		#	-	-
	umhos/cm	0231	05/04/2004	N001	925		#	-	-

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE MOA01, Moab Disposal Site  
 REPORT DATE: 7/16/2004 3:20 pm

PARAMETER	UNITS	LOCATION ID	SAMPLE:		RESULT	QUALIFIERS:				
			DATE	ID		LAB	DATA	QA	DETECTION LIMIT	UN- CERTAINTY
Specific Conductance	umhos/cm	0232	05/05/2004	N001	889			#	-	-
	umhos/cm	0233	05/05/2004	N001	893			#	-	-
	umhos/cm	0234	05/05/2004	N001	908			#	-	-
	umhos/cm	CR1	05/03/2004	N001	840			#	-	-
	umhos/cm	CR3	05/05/2004	N001	891			#	-	-
	umhos/cm	CR5	05/03/2004	N001	873			#	-	-
Sulfate	mg/L	0201	05/03/2004	0001	190			#	5	-
	mg/L	0204	05/11/2004	0001	99			#	5	-
	mg/L	0217	05/07/2004	0001	180			#	5	-
	mg/L	0217	05/07/2004	0002	180			#	5	-
	mg/L	0219	05/06/2004	0001	200			#	5	-
	mg/L	0220	05/06/2004	0001	200			#	5	-
	mg/L	0221	05/06/2004	0001	210			#	5	-
	mg/L	0222	05/06/2004	0001	210			#	5	-
	mg/L	0223	05/05/2004	0001	540			#	10	-
	mg/L	0224	05/05/2004	0001	740			#	10	-
	mg/L	0224	05/05/2004	0002	720			#	10	-
	mg/L	0225	05/05/2004	0001	280			#	5	-
	mg/L	0226	05/04/2004	0001	200			#	5	-
	mg/L	0227	05/04/2004	0001	200			#	5	-
	mg/L	0228	05/04/2004	0001	190			#	5	-
	mg/L	0229	05/04/2004	0001	5800			#	50	-
	mg/L	0230	05/04/2004	0001	250			#	5	-
	mg/L	0231	05/04/2004	0001	200			#	5	-
	mg/L	0232	05/05/2004	0001	190			#	5	-
	mg/L	0233	05/05/2004	0001	200			#	5	-
	mg/L	0234	05/05/2004	0001	200			#	5	-
	mg/L	CR1	05/03/2004	0001	180			#	5	-
mg/L	CR3	05/05/2004	0001	200			#	5	-	
mg/L	CR5	05/03/2004	0001	180			#	5	-	
Temperature	C	0201	05/03/2004	N001	19.04			#	-	-
	C	0204	05/11/2004	N001	16.34			#	-	-
	C	0217	05/07/2004	N001	19.04			#	-	-
	C	0219	05/06/2004	N001	19.59			#	-	-
	C	0220	05/06/2004	N001	20.67			#	-	-
	C	0221	05/06/2004	N001	20.14			#	-	-
	C	0222	05/06/2004	N001	19.76			#	-	-
	C	0223	05/05/2004	N001	20.50			#	-	-

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE MOA01, Moab Disposal Site  
 REPORT DATE: 7/16/2004 3:20 pm

PARAMETER	UNITS	LOCATION ID	SAMPLE:		RESULT	QUALIFIERS:			DETECTION LIMIT	UN-CERTAINTY	
			DATE	ID		LAB	DATA	QA			
Temperature	C	0224	05/05/2004	N001	25.23				#	-	-
	C	0225	05/05/2004	N001	21.97				#	-	-
	C	0226	05/04/2004	N001	19.40				#	-	-
	C	0227	05/04/2004	N001	20.26				#	-	-
	C	0228	05/04/2004	N001	17.67				#	-	-
	C	0229	05/04/2004	N001	27.53				#	-	-
	C	0230	05/04/2004	N001	22.5				#	-	-
	C	0231	05/04/2004	N001	20.8				#	-	-
	C	0232	05/05/2004	N001	20.39				#	-	-
	C	0233	05/05/2004	N001	20.16				#	-	-
	C	0234	05/05/2004	N001	19.76				#	-	-
	C	CR1	05/03/2004	N001	18.63				#	-	-
	C	CR3	05/05/2004	N001	18.91				#	-	-
	C	CR5	05/03/2004	N001	19.15				#	-	-
Total Dissolved Solids	mg/L	0201	05/03/2004	0001	550				#	20	-
	mg/L	0204	05/11/2004	0001	320				#	20	-
	mg/L	0217	05/07/2004	0001	500				#	20	-
	mg/L	0217	05/07/2004	0002	500				#	20	-
	mg/L	0219	05/06/2004	0001	550				#	20	-
	mg/L	0220	05/06/2004	0001	550				#	20	-
	mg/L	0221	05/06/2004	0001	570				#	20	-
	mg/L	0222	05/06/2004	0001	560				#	20	-
	mg/L	0223	05/05/2004	0001	1100				#	40	-
	mg/L	0224	05/05/2004	0001	1500				#	40	-
	mg/L	0224	05/05/2004	0002	1500				#	40	-
	mg/L	0225	05/05/2004	0001	670				#	20	-
	mg/L	0226	05/04/2004	0001	570				#	20	-
	mg/L	0227	05/04/2004	0001	570				#	20	-
	mg/L	0228	05/04/2004	0001	550				#	20	-
	mg/L	0229	05/04/2004	0001	10000				#	400	-
	mg/L	0230	05/04/2004	0001	670				#	20	-
	mg/L	0231	05/04/2004	0001	580				#	20	-
	mg/L	0232	05/05/2004	0001	550				#	20	-
	mg/L	0233	05/05/2004	0001	560				#	20	-
	mg/L	0234	05/05/2004	0001	550				#	20	-
mg/L	CR1	05/03/2004	0001	550				#	20	-	
mg/L	CR3	05/05/2004	0001	570				#	20	-	
mg/L	CR5	05/03/2004	0001	550				#	20	-	

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE MOA01, Moab Disposal Site  
 REPORT DATE: 7/16/2004 3:20 pm

PARAMETER	UNITS	LOCATION		SAMPLE:		RESULT	QUALIFIERS: DETECTION UN-		
		ID	DATE	ID	LAB DATA QA		LIMIT	CERTAINTY	
Turbidity	NTU	0204	05/11/2004	N001		596	#	-	-
	NTU	0217	05/07/2004	N001		276	#	-	-
	NTU	0219	05/06/2004	N001		209	#	-	-
	NTU	0220	05/06/2004	N001		167	#	-	-
	NTU	0221	05/06/2004	N001		222	#	-	-
	NTU	0222	05/06/2004	N001		160	#	-	-
	NTU	0223	05/05/2004	N001		78	#	-	-
	NTU	0225	05/05/2004	N001		182	#	-	-
	NTU	0226	05/04/2004	N001		195	#	-	-
	NTU	0227	05/04/2004	N001		145	#	-	-
	NTU	0228	05/04/2004	N001		224	#	-	-
	NTU	0229	05/04/2004	N001		106	#	-	-
	NTU	0230	05/04/2004	N001		214	#	-	-
	NTU	0231	05/04/2004	N001		285	#	-	-
	NTU	0232	05/05/2004	N001		180	#	-	-
	NTU	0233	05/05/2004	N001		180	#	-	-
	NTU	0234	05/05/2004	N001		118	#	-	-
		NTU	CR3	05/05/2004	N001		187	#	-
Uranium	mg/L	0201	05/03/2004	0001		0.0034	#	0.0001	-
	mg/L	0204	05/11/2004	0001		0.0017	#	0.0001	-
	mg/L	0217	05/07/2004	0001		0.0031	#	0.0001	-
	mg/L	0217	05/07/2004	0002		0.0029	#	0.0001	-
	mg/L	0219	05/06/2004	0001		0.012	#	0.0001	-
	mg/L	0220	05/06/2004	0001		0.0057	#	0.0001	-
	mg/L	0221	05/06/2004	0001		0.0065	#	0.0001	-
	mg/L	0222	05/06/2004	0001		0.0065	#	0.0001	-
	mg/L	0223	05/05/2004	0001		0.094	#	0.0001	-
	mg/L	0224	05/05/2004	0001		0.160	#	0.001	-
	mg/L	0224	05/05/2004	0002		0.150	#	0.001	-
	mg/L	0225	05/05/2004	0001		0.028	#	0.0001	-
	mg/L	0226	05/04/2004	0001		0.0054	#	0.0001	-
	mg/L	0227	05/04/2004	0001		0.005	#	0.0001	-
	mg/L	0228	05/04/2004	0001		0.004	#	0.0001	-
	mg/L	0229	05/04/2004	0001		1.800	#	0.01	-
	mg/L	0230	05/04/2004	0001		0.023	#	0.0001	-
	mg/L	0231	05/04/2004	0001		0.015	#	0.0001	-
mg/L	0232	05/05/2004	0001		0.0044	#	0.0001	-	
mg/L	0233	05/05/2004	0001		0.0055	#	0.0001	-	

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE MOA01, Moab Disposal Site  
 REPORT DATE: 7/16/2004 3:20 pm

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
Uranium	mg/L	0234	05/05/2004	0001	0.0064	#	0.0001	-
	mg/L	CR1	05/03/2004	0001	0.0019	#	0.0005	-
	mg/L	CR3	05/05/2004	0001	0.0065	#	0.0001	-
	mg/L	CR5	05/03/2004	0001	0.0038	#	0.0001	-

RECORDS: SELECTED FROM USEE800 WHERE site\_code='MOA01' AND quality\_assurance = TRUE AND (data\_validation\_qualifiers IS NULL OR data\_validation\_qualifiers NOT LIKE '%R%' AND data\_validation\_qualifiers NOT LIKE '%X%') AND DATE\_SAMPLED between #5/1/2004# and #5/16/2004#

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

LAB QUALIFIERS:

- \* Replicate analysis not within control limits.
- + Correlation coefficient for MSA < 0.995.
- > Result above upper detection limit.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
- C Pesticide result confirmed by GC-MS.
- D Analyte determined in diluted sample.
- E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- J Estimated
- M GFAA duplicate injection precision not met.
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
- P > 25% difference in detected pesticide or Arochlor concentrations between 2 columns.
- S Result determined by method of standard addition (MSA).
- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- X Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- Y Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- Z Laboratory defined (USEPA CLP organic) qualifier, see case narrative.

DATA QUALIFIERS:

- F Low flow sampling method used.
- J Estimated value.
- Q Qualitative result due to sampling technique
- U Parameter analyzed for but was not detected.
- G Possible grout contamination, pH > 9.
- L Less than 3 bore volumes purged prior to sampling.
- R Unusable result.
- X Location is undefined.

QA QUALIFIER: # = validated according to Quality Assurance guidelines.

BLANKS REPORT

LAB CODE: PAR, PARAGON (Fort Collins, CO)

LAB REQUISITION(S): 04030050

REPORT DATE: 06/28/04 04:00:25: PM

PARAMETER	SITE CODE	LOCATION ID	SAMPLE DATE	SAMPLE ID	UNITS	RESULT	QUALIFIERS LAB DATA	DETECTION LIMIT	UNCERTAINTY	SAMPLE TYPE
Ammonia Total as N	MOA01	0999	05/06/2004	0001	mg/L	0.1	U	0.1		E
Ammonia Total as N	MOA01	0999	05/11/2004	0001	mg/L	0.1	U	0.1		E
Chloride	MOA01	0999	05/06/2004	0001	mg/L	0.2	U	0.2		E
Chloride	MOA01	0999	05/11/2004	0001	mg/L	0.2	U	0.2		E
Sulfate	MOA01	0999	05/06/2004	0001	mg/L	0.5	U	0.5		E
Sulfate	MOA01	0999	05/11/2004	0001	mg/L	0.5	U	0.5		E
Total Dissolved Solids	MOA01	0999	05/06/2004	0001	mg/L	20	U	20		E
Total Dissolved Solids	MOA01	0999	05/11/2004	0001	mg/L	20	U	20		E
Uranium	MOA01	0999	05/06/2004	0001	mg/L	0.000031	B	0.0001		E
Uranium	MOA01	0999	05/11/2004	0001	mg/L	0.000052	B	0.0001		E

BLANKS REPORT

LAB CODE: PAR, PARAGON (Fort Collins, CO)

LAB REQUISITION(S): 04030050

REPORT DATE: 06/28/04 04:00:25: PM

PARAMETER	SITE CODE	LOCATION ID	SAMPLE DATE	SAMPLE ID	UNITS	RESULT	QUALIFIERS LAB DATA	DETECTION LIMIT	UNCERTAINTY	SAMPLE TYPE
-----------	-----------	-------------	-------------	-----------	-------	--------	---------------------	-----------------	-------------	-------------

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

LAB QUALIFIERS:

- \* Replicate analysis not within control limits.
- + Correlation coefficient for MSA < 0.995.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
- E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
- Z Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- C Pesticide result confirmed by GC-MS.
- M GFAA duplicate injection precision not met.
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
- S Result determined by method of standard addition (MSA).
- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- D Analyte determined in diluted sample.
- P > 25% difference in detected pesticide or Arochlor concentrations between 2 columns.
- X Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- Y Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- > Result above upper detection limit.
- J Estimated

DATA QUALIFIERS:

- |                                                      |                                                |                                         |
|------------------------------------------------------|------------------------------------------------|-----------------------------------------|
| J Estimated value.                                   | F Low flow sampling method used.               | G Possible grout contamination, pH > 9. |
| L Less than 3 bore volumes purged prior to sampling. | R Unusable result.                             | X Location is undefined.                |
| U Parameter analyzed for but was not detected.       | Q Qualitative result due to sampling technique |                                         |

SAMPLE TYPES:

- E EQUIPMENT BLANK

**MIN/MAX  
TABLE**

SAMPLING DATA VALIDATION MINIMUMS AND MAXIMUMS REPORT -- No Field Parameters

LAB CODE: PAR, PARAGON (Fort Collins, CO)

LAB REQUISITION(S): 04030050

HISTORY BEGIN DATE: comparing to all historical data

REPORT DATE: 06/28/04 04:00:54: PM

SITE CODE	LOCATION CODE	SAMPLE DATE	ANALYTE	CURRENT			HISTORICAL MAXIMUM			HISTORICAL MINIMUM			COUNT	
				RESULT	QUALIFIERS LAB DATA		RESULT	QUALIFIERS LAB DATA		RESULT	QUALIFIERS LAB DATA		N	N BELOW DETECT
MOA01	0201	05/03/2004	Chloride	74			177			126			5	0
MOA01	0201	05/03/2004	Sulfate	190			433			277			5	0
MOA01	0201	05/03/2004	Uranium	0.0034			0.0088			0.0057			5	0
MOA01	0437	05/11/2004	Ammonia Total as N	0.1	U	F	1630.435	QJ		0.8929	QJ		9	0
MOA01	0439	05/11/2004	Total Dissolved Solids	7800		F	63900	Q		8000	Q		13	0
MOA01	ATP-2-D	05/11/2004	Ammonia Total as N	440		F	670			482			5	0
MOA01	ATP-2-S	05/11/2004	Ammonia Total as N	300		F	1130			424.689	JF		14	0
MOA01	CR1	05/03/2004	Total Dissolved Solids	550			1060			710			8	0
MOA01	CR1	05/03/2004	Uranium	0.0019			0.008			0.0023			13	0
MOA01	CR3	05/05/2004	Total Dissolved Solids	570			1780			930			5	0
MOA01	CR5	05/03/2004	Total Dissolved Solids	550			1110			812			6	0
MOA01	TP-02	05/11/2004	Sulfate	1400		F	2810			1710	F		13	0
MOA01	TP-02	05/11/2004	Total Dissolved Solids	3400		F	5820			4080	F		10	0
MOA01	TP-02	05/11/2004	Uranium	12	N	JF	26			13	F		14	0
MOA01	TP-19	05/04/2004	Ammonia Total as N	3.2		F	10.2			3.929	JF		5	0

SAMPLING DATA VALIDATION MINIMUMS AND MAXIMUMS REPORT -- No Field Parameters

LAB CODE: PAR, PARAGON (Fort Collins, CO)

LAB REQUISITION(S): 04030050

HISTORY BEGIN DATE: comparing to all historical data

REPORT DATE: 06/28/04 04:00:54: PM

SITE CODE	LOCATION CODE	SAMPLE DATE	ANALYTE	CURRENT		HISTORICAL MAXIMUM		HISTORICAL MINIMUM		COUNT	
				RESULT	QUALIFIERS LAB DATA	RESULT	QUALIFIERS LAB DATA	RESULT	QUALIFIERS LAB DATA	N	N BELOW DETECT

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

LAB QUALIFIERS:

- \* Replicate analysis not within control limits.
- + Correlation coefficient for MSA < 0.995.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
- E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
- Z Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- C Pesticide result confirmed by GC-MS.
- M GFAA duplicate injection precision not met.
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
- S Result determined by method of standard addition (MSA).
- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- D Analyte determined in diluted sample.
- P > 25% difference in detected pesticide or Arochlor concentrations between 2 columns.
- X Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- Y Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- > Result above upper detection limit.
- J Estimated

DATA QUALIFIERS:

- |                                                      |                                                |                                         |
|------------------------------------------------------|------------------------------------------------|-----------------------------------------|
| J Estimated value.                                   | F Low flow sampling method used.               | G Possible grout contamination, pH > 9. |
| L Less than 3 bore volumes purged prior to sampling. | R Unusable result.                             | X Location is undefined.                |
| U Parameter analyzed for but was not detected.       | Q Qualitative result due to sampling technique |                                         |



**SAMPLING AND ANALYSIS  
WORK ORDER AND TRIP REPORT**



Grand Junction Office

established 1959

Task Order ST04-204  
Control Number 1000-T04-0952

March 16, 2004

Donald R. Metzler  
Program Manager  
U.S. Department of Energy  
Grand Junction Site  
2597 B ¾ Road  
Grand Junction, CO 81503

SUBJECT: Contract No. DE-AC01-02GJ79491, Stoller  
March 2004 Environmental Sampling at Moab, Utah

Reference: FY 2004 Task Order No. ST04-204-02

Dear Mr. Metzler:

The purpose of this letter is to inform you of the upcoming sampling event at Moab, Utah. Enclosed are the maps and tables specifying sample locations and analytes for ground water and surface water monitoring. Water quality data will be collected from individual wells, individual surface locations, and collocated wells and surface locations specified in the February 2004 *Surface Water and Ground Water Monitoring Plan for the Moab, Utah, Site*. This sampling event, tentatively scheduled for the end of March or beginning of April, should coincide with increasing river flows on the Colorado River; therefore, the exact date will be determined after daily review of hydrographs.

The following lists show the locations scheduled to be sampled during this event.

**Well Location**

TP-02  
0401/0408  
0402  
0403  
0404  
0405  
0406  
0407  
0492  
TP-17  
TP-18  
TP-19  
0437  
0439  
ATP2S  
ATP2D

**Surface Water Location**

0218 – 1 near shore; 1 in stream (Collocated)  
0222 (Collocated)  
0223 – 1 near shore; 1 in stream (Collocated)  
0224 (Collocated)  
0221 (Collocated)  
0220 (Collocated)  
0219 (Collocated)  
0225 (Collocated)  
CR-3 – 1 near shore; 1 in stream (Collocated)  
0226 (Collocated)  
0227 1 near shore; 1 in stream (Collocated)  
0228 (Collocated)  
CR5  
0201  
CR1  
0217  
Opportunistic (TBD)

Opportunistic sampling also will be conducted at one or two locations yet to be determined if and when water in those locations meets minimum habitat requirements.

Habitat information for each surface water sample location will be recorded on the field form provided in Attachment 1 to the February 2004 *Surface Water and Ground Water Monitoring Plan for the Moab, Utah, Site*.

QA/QC samples also will be collected as directed in the *Sampling and Analysis Plan for GJO Projects*. Access agreements for the Moab site are in review and expected to be completed by the start of fieldwork.

If you have any questions, please call me at extension 6432 or Ken Karp at extension 6564.

Sincerely,

Toby Wright  
Moab Project Manager

/lcg/lad  
Enclosures (3)

cc: C. I. Bahrke, Stoller  
S. E. Donovan, Stoller  
D. G. Traub, Stoller  
K. E. Karp, Stoller  
Project File MOA 19.3 (Thru S. Back)

cc w/o enclosures:  
K. E. Miller, Stoller  
Correspondence Control File (Thru V. Creagar)

*Memorandum*

Control Number N/A

DATE: June 23, 2004  
TO: Kenneth E. Karp  
FROM: David G. Traub  
SUBJECT: Sampling Trip Report  
Site: Moab, Utah

**Dates of Sampling Event:** May 3 through May 11, 2004.

**Team Members:** Dave Traub, Craig Goodknight, Dan Sellers, and Tony Franzone.

**Trip Summary:** Water samples were collected from 17 wells and 22 surface water locations. Six new surface water locations were created to collect water samples in several areas of interest according to the purposes described in the February 2004 *Surface Water and Ground Water Monitoring Plan for the Moab, Utah, Site*. After samples were collected, all the new locations were surveyed with a GPS unit. All new surface water sample locations were photographed.

**Locations Not Sampled / Reason:** Samples were not collected along the Colorado River from Areas A, B, or C. The river did not rise high enough to flood these locations. If the river had risen another six inches, portions of these areas would have flooded. These areas were checked several times to verify the water levels as the river flow increased.

**Field Variance:** None.

**RIN Numbers Assigned:** Samples were shipped to Paragon Analytical. The RIN assigned to this event was 04030050.

**Water Level Measurements:** Water level measurements were taken in all sampled wells.

**Well Inspection Summary:** Only wells scheduled for sampling were inspected. Well 0437 is situated in the center of the spray area on top of the cell and salts are corroding the surface installation.

**Quality Control Sample Cross Reference:** Three sample duplicates were collected for quality control. Two equipment blanks were collected with the peristaltic pump used for sampling.

The following table lists the identification numbers of the quality control samples.

Sample ID	False Loc.	True Loc.	Sample Type
NDT 450	2200	Surf. 0224	Sample Duplicate
NDT 749	2201	NA	Equipment Blank
NDT 657	2202	Surf. 0217	Sample Duplicate
NDT 663	2203	Surf. 0204	Sample Duplicate
NDT 665	2204	NA	Equipment Blank

**Corrective Action:** None.

**Equipment:** Wells were sampled using the low flow purge procedure with dedicated bladder pumps or dedicated tubing in each well. Surface water samples were collected using a portable peristaltic pump. Dissolved oxygen was measured in the surface water samples but not in ground water wells. High H<sub>2</sub>S concentrations will rapidly ruin our D.O. sensors so two sets of water quality monitors were used, one for ground water with the D.O. sensor removed, and one for surface waters.

**Colorado River Discharge Rates:** The following table displays the Colorado River flow-rate noted during the sampling event.

Date	Time	Flow
5/4/2004	0900	4150 CFS
5/5/2004	0600	4300 CFS
5/6/2004	0600	5280 CFS
5/6/2004	1200	5500 CFS
5/7/2004	0600	6700 CFS
5/10/2004	1600	9400 CFS

Information downloaded from the USGS website.

USGS Data from Cisco Gage Station		
Date	Gage Height	Discharge
05/01/2004	2.95	4,490
05/02/2004	2.98	4,550
05/03/2004	2.84	4,270
05/04/2004	2.80	4,190
05/05/2004	3.02	4,660
05/06/2004	3.46	5,649
05/07/2004	4.00	6,939
05/08/2004	4.47	8,120
05/09/2004	4.76	8,880
05/10/2004	4.88	9,200
05/11/2004	5.09	9,790
05/12/2004	5.30	10,400
05/13/2004	5.14	9,930
05/14/2004	4.70	8,720
05/15/2004	4.15	7,340

**Location Specific Information:**

Sample ID	Date	Location	Comment
NDT 428	5/3/04	Surf. CR1	Several fish jumping in river just west of loc. Sample depth ~ 5 in.; low flow, 3" visibility. 18.6°
NDT 429	5/3/04	Surf. 0201	Several fish jumping in river. Sample depth ~ 5 in. , very low flow, 3" visibility. 19.0°
NDT 430	5/3/04	Surf. CR5	Sample depth ~12 in., medium flow, slight ripples, cloudy, 2" visibility. 19.2°
NDT 431	5/4/04	TP19	Strong H <sub>2</sub> S odor, turned plastic and glassware black.
NDT 432	5/4/04	Surf. 0228	8-10" fish jumping nearby, scattered submerged tamarisk in area to 10 ft. from bank, sample depth ~10 in. deep, muddy, 3" visibility, slight flow. 17.7°
NDT 434	5/4/04	Surf. 0229	Seine Loc. Sample depth 6-7 in., very slight flow to river, almost stagnant, 106 NTU. 27.5°
NDT 435	5/4/04	Surf. 0230	Seine Location. Sample depth 4 in., very slight flow in channel, cloudy, 214 NTU. 22.5°
NDT 436	5/4/04	Surf. 0231	Seine Location. Sample depth 4 in., calm flow, several small fish jumping nearby, this location is about 5 ft. downriver from the 8 in. intake pipe. 20.8°
NDT 433	5/4/04	Surf. 0227	Sample depth 4 in., slight current, muddy, 3" visibility, sample collected 4 ft. from bank. 20.3°
NDT 437	5/4/04	TP-18	Collocated with Surf. 0227 and 0232.
NDT 438	5/4/04	TP-17	Collocated with Surf. 0226.
NDT 439	5/4/04	Surf. 0226	Collocated w/TP-17. Sample depth 16 in., 12 in. from bank, med. flow, 195 NTU. 19.4°
NDT 440	5/5/04	0492	Collocated with Surf. CR-3 and 0233.
NDT 441	5/5/04	Surf. CR3	Sample collected 8 in. deep, 12 in. from bank, slow flow, murky, 3-4 in. visibility, 187 NTU. 18.9°
NDT 442	5/5/04	Surf 0233	Sample collected ~10 ft. into channel from Loc. CR3. Depth is uncertain, medium flow, 8-10" fish jumping nearby, main channel. 20.2°
NDT 443	5/5/04	Surf. 0232	Sample collected ~15 ft. from Loc. 0227, very cloudy, 180 NTU, medium flow. 20.4°
NDT 444	5/5/04	0407	Collocated with Surf. 0225.
NDT 445	5/5/04	Surf. 0225	Collocated with well 0407. Sample depth, 5-6 in., 5 ft. from bank, medium flow, murky, 182 NTU., some plants in water, side channel with several shallow gravel bars in area. Island just across channel has recently been under water 6-8" higher than today. 22.0°
NDT 446	5/5/04	0403	Collocated with Surf. Loc. 0224.
NDT 447	5/5/04	Surf. 0224	Collocated with well 0403, Sample depth ~6 in., 9 ft. from bank, low flow, side channel, some tamarisk hanging over bank edge, several small islands in area were submerged but are now dry. Pin flag for Loc. 0229 is 40 yards to north on opposite side of this small channel (30 ft. across). 25.2°
NDT 448	5/5/04	0402	Collocated with Surf. Locs. 0223 and 0234.

Sample ID	Date	Location	Comment
NDT 449	5/5/04	Surf. 0223	Collocated with well 0402 and Surf. 0234, further out in channel. Sample depth 6 in., 20 ft. from bank, low flow, murky, 5 in. visibility, 78 NTU, Flag for Loc. 0229 is 80 ft. to south. Side channel, 40 to 50 ft. across, seine location. 20.5°
NDT 744	5/5/04	Surf. 0234	This location is in the main channel on east side of small island where Loc. 0223 was collected in the side channel. There is one island further to east so main channel flow splits slightly upstream but there is no safe access to the other island. Sample was collected 10 in. deep, near bank, medium flow, 118 NTU, some fish jumping nearby, plants are 5 ft. into channel from this island. Willows are 3-5 ft. tall, rushes, tamarisk. 19.7°
NDT 743	5/6/04	0401	Collocated with Surf. 0222.
NDT 745	5/6/04	0408	Collocated with Surf. 0222.
NDT 746	5/6/04	Surf. 0222	Collocated with well 0408 and well 0401. Sampled 8 in. deep, 6 ft. from bank, low flow, very cloudy, 5-6 in. visibility, 160 NTU, Side channel is 40 to 50 ft. across. River is up several inches since yesterday, much more flow through this channel today. 19.8°
NDT 747	5/6/04	0404	Collocated with Surf. 0221.
NDT 748	5/6/04	Surf. 0221	Collocated with well 0404. Sample collected in 6-8 in. water, 4 ft. from bank, med flow, very cloudy, 222 NTU, side channel. Loc 0221 was collected 6 ft. from the Loc. 0230 pin flag. River is up several inches from yesterday. Yesterdays footprints are under 3 in. of water today. 20.1°
NDT 750	5/6/04	0405	Collocated with Surf. 0220.
NDT 653	5/6/04	Surf. 0220	Collocated with well 0405. Sample collected 6 in. deep, 4 ft. from bank, low to medium flow, cloudy, 167 NTU. Edge of main channel, dry most of year but recently submerged, lot of submerged weeds / tamarisk in area. School of ~30 small fish, 1 to 1.5 in. long 14 inches from my feet at waters edge. Took photos of fish at sampling loc. 20.7°
NDT 654	5/6/04	0406	Collocated with Surf. Loc. 0219. Data logger in well.
NDT 655	5/6/04	Surf. 0219	Collocated with well 0406, 0219 is about 100 ft. down river from the 8 inch intake pipe. Sample collected 8 in. deep, medium flow, very cloudy, 209 NTU, collected from main channel. 19.6°
NDT 656	5/7/04	Surf. 0217	Surface location 0217 was set on the east side of the Colorado River inside the Matheson Nature Preserve. Sample was collected from the bottom, 8-10 in. deep, 6 ft. from bank, low to medium flow, very cloudy, 276 NTU. Location is at mouth of a side channel, recently submerged plants, weeds, tamarisk. Just off of a gravel / rock bar opposite Courthouse Wash. 19.0°
NDT 658	5/11/04	0439	
NDT 659	5/11/04	0437	Salt spray is corroding lock and surface mount.
NDT 660	5/11/04	ATP-2-S	
NDT 661	5/11/04	ATP-2-D	Lot of gas coming up dedicated tubing.
NDT 662	5/11/04	TP-02	Collocated with Surf. 0204. Location 0204 is 100 ft. to SW.
NDT 664	5/11/04	Surf. 0204	This was to be sampled as surface location 0218, collocated with well TP-02. As there is no river access at TP-02, this sample was collected at the existing surface location 0204, about 100 ft. to the southwest of TP-02. Due to the steep bank and the high river level there was no sample collected further out in the main channel. (The further out sample was to be new loc. 0235 but was not used this event). The steep bank drops right into the river at this location. Location 0204 was sampled in ~14 in. of water, 12 in. from bank. Medium flow, 596 NTU. 16.3°

**Regulatory:** None

**Site Issues:** It would be good to renumber the site wells to avoid the confusion created by the wide variety of well names and numbers. An 8-inch PVC pipe with a cap should be dropped over well 0437 to protect it from the continual salt spray.

**Additional Action Required / Taken:** None.

**Next Sampling Trip:** None.

(DGT/lcg)

cc: J. D. Berwick, DOE-EM (e)  
D. R. Metzler, DOE-EM  
C. I. Bahrke, Stoller (e)  
K. E. Miller, Stoller (e)  
L. M. Wright, Stoller (e)  
Working File: MOA

# **WATER LEVELS**

STATIC WATER LEVELS (USEE700) FOR SITE MOA01, Moab Disposal Site  
 REPORT DATE: 7/15/2004 10:11 am

LOCATION CODE	FLOW CODE	TOP OF CASING ELEVATION (FT)	MEASUREMENT		DEPTH FROM TOP OF CASING (FT)	WATER ELEVATION (FT)	WATER LEVEL FLAG
			DATE	TIME			
0401	O	3969.60	05/06/2004	08:24	15.49	3954.11	
0402	O	3968.63	05/05/2004	17:08	15.15	3953.48	
0403	O	3968.95	05/05/2004	15:35	15.69	3953.26	
0404	O	3968.30	05/06/2004	10:41	13.75	3954.55	
0405	O	3968.47	05/06/2004	15:30	13.92	3954.55	
0406	O	3969.91	05/06/2004	16:43	15.10	3954.81	
0407	O	3969.09	05/05/2004	13:23	16.33	3952.76	
0408	O	3969.17	05/06/2004	09:09	15.00	3954.17	
0437	O	4048.25	05/11/2004	09:30	89.60	3958.65	
0439	O	4055.27	05/11/2004	08:12	96.78	3958.49	
0492		-	05/05/2004	08:32	15.40	-15.40	
ATP-2-D	O	3967.05	05/11/2004	11:13	12.37	3954.68	
ATP-2-S	O	3967.04	05/11/2004	10:20	10.42	3956.62	
TP-02	O	3975.55	05/11/2004	13:52	19.72	3955.83	
TP-17	D	3963.69	05/04/2004	15:16	11.54	3952.15	
TP-18	D	3963.63	05/04/2004	15:21	11.92	3951.71	
TP-19	D	3962.17	05/04/2004	08:30	10.84	3951.33	

RECORDS: SELECTED FROM USEE700 WHERE site\_code='MOA01' AND LOG\_DATE between #5/1/2004# and #5/19/2004#

FLOW CODES: D DOWN GRADIENT O ON-SITE

WATER LEVEL FLAGS:

**SAMPLING LOCATION  
MAP**

