

*Office of Environmental Management – Grand Junction*



Moab UMTRA Project  
August 2008 Validation Data Package  
for Performance Assessment of the  
Monthly Sampling for the Ground Water  
Interim Action and for the Wood Chip  
Area Sampling Event

April 2009



U.S. Department  
of Energy

**Office of Environmental Management**

**Moab UMTRA Project  
August 2008 Validation Data Package for Performance Assessment  
of the Monthly Sampling for the Ground Water Interim Action and  
for the Wood Chip Area Sampling Event**

**April 2009**

**Moab UMTRA Project**  
**August 2008 Ground Water Sampling Events**

---

**Revision 0**

---

**Review and Approval**

*KGP*

*4/23/09*

---

Kenneth G. Pill  
TAC Ground Water Manager

Date

*for Thomas C. Bachtel*

*4/29/09*

---

Joseph D. Ritchey  
TAC Senior Program Manager

Date

## Revision History

<b>Revision No.</b>	<b>Date</b>	<b>Reason/Basis for Revision</b>
0	April 2009	Initial issue.

## Table of Contents

Section	Page
Acronyms and Abbreviations .....	v
<b>1.0 Introduction.....</b>	<b>1</b>
1.1 Summary Criteria.....	1
1.1.1 Monthly Sampling Event.....	1
1.1.2 Wood Chip Area Sampling Event .....	2
1.2 Sampling Event Summaries.....	5
1.2.1 Monthly Sampling Event.....	5
1.2.2 Wood Chip Area Sampling Event .....	10
1.3 Sampling and Analyses.....	11
1.3.1 Monthly Sampling Event.....	11
1.3.2 Wood Chip Area Sampling Event .....	11
<b>2.0 Data Assessment Summaries .....</b>	<b>12</b>
2.1 Water Sampling Field Activities Verification .....	12
2.2 Laboratory Performance Assessments.....	12
2.2.1 Monthly Sampling Event.....	12
2.2.2 Wood Chip Area Sampling Event .....	17
2.3 Field Analyses/Activities.....	21
2.3.1 Monthly Sampling Event.....	21
2.3.2 Wood Chip Area Sampling Event .....	21
2.4 Certification .....	21
<b>3.0 Data Presentation.....</b>	<b>22</b>
3.1 Minimums and Maximums Reports .....	22
3.2 Anomalous Data Review .....	22
3.3 Water Quality Data.....	23
3.4 Water Level Data.....	23
3.5 Blanks Report .....	23

### Tables

Table 1. Monthly Sampling Event Surface Water Ammonia Concentrations and Comparisons to State of Utah and Federal Criteria.....	9
Table 2. Comparison of Sampling Results for the Wood Chip Area.....	10
Table 3. Wood Chip Area Sampling Event Surface Water Ammonia Concentrations and Comparisons to State of Utah and Federal Criteria.....	11
Table 4. Interim Action Analytes and Methods.....	13
Table 5. Interim Action Data Qualifiers .....	13
Table 6. Interim Action Reason Codes for Data Flags .....	14
Table 7. Wood Chip Area Sampling Event Analytes and Methods .....	18

**Figures**

Figure 1. Sample Locations at the Interim Action Well Field and Baseline Area.....3  
Figure 2. Sample Locations for Wood Chip Area Sampling Event.....4  
Figure 3. CF3 Observation Wells Time Versus Ammonia Total (as N) Concentration Plot .....6  
Figure 4. CF3 Observation Wells Time Versus TDS Concentration Plot .....6  
Figure 5. CF3 Observation Wells Time Versus Uranium Concentration Plot .....7  
Figure 6. CF1 Observation Wells 0403 and 0407 Time Versus Ammonia Total (as N)  
Concentration Plot.....8  
Figure 7. CF1 Observation Wells 0403 and 0407 Time Versus TDS Concentration Plot .....8  
Figure 8. CF1 Observation Wells 0403 and 0407 Time Versus Uranium Concentration Plot.....9

**Appendices**

Appendix A. Water Sampling Field Activities Verification..... A-1  
Appendix B. Minimums and Maximums Reports .....B-1  
Appendix C. Water Quality Data.....C-1  
Appendix D. Water Level Data ..... D-1

**Attachments**

- Attachment 1. Interim Action Well Field Monthly Sampling Trip Report
- Attachment 2. Wood Chip Area Sampling Trip Report

## Acronyms and Abbreviations

bgs	below ground surface
CF	Configuration
cfs	cubic feet per second
COC	chain of custody
EB	equipment blank
EDD	electronic data deliverable
EPA	Environment Protection Agency
ft	feet
gpm	gallons per minute
ICP	inductively coupled plasma
IDL	instrument detection limit
LCS	laboratory control samples
MDL	method detection limit
mg/L	milligrams per liter
MS	matrix spike
MSD	matrix spike duplicate
PQL	practical quantitation limit
RDL	required detection limit
RIN	report identification number
RPD	relative percent difference
SDG	sample data group
TDS	total dissolved solids
UMTRA	Uranium Mill Tailings Remedial Action
USGS	U.S. Geological Survey
VDP	validation data package

## 1.0 Introduction

The purpose of this document is to summarize the results of the data validation process associated with ground water and/or surface water samples collected from the Moab Uranium Mill Tailings Remedial Action (UMTRA) site. This data validation follows the criteria according to the *Environmental Procedures Catalog*, “Standard Practice for Validation of Laboratory Data,” GT-9(P) (2006).

As part of the scope of this document, the complete results of this data validation process are provided. Section 1 presents the Summary Criteria, Sampling Event Summaries, and Sampling and Analyses. Section 2 provides the Data Assessment Summaries, including the Field Activity Verification, Laboratory Performance Assessment, Field Analyses/Activities description, and Certification. All flagged data, and the reasons for the applicable flags, are also presented in Section 2. The Data Presentation is contained in Section 3, which includes a summary of the anomalous data generated by the validation process. Various appendices contain the Water Quality Data, Water Level Data, and the Minimums and Maximums Reports tables. The trip reports are included in Attachments 1 and 2. All Colorado River flow discussed in this document are measured from the U.S. Geological Survey (USGS) Cisco gaging station No. 09180500.

This validation data package (VDP) presents the results of two August 2008 sampling events. A monthly sampling event was completed from August 4 through 13, 2008, in which ground water and surface water samples were collected from a variety of locations across the well field. From August 25 through 27, 2008, ground water and surface water locations were sampled as part of the wood chip area sampling event. This event represents the first time in nearly six years that some of these locations have been sampled in this vicinity of the site.

Section 1.0 contains the Summary Criteria with a sample location map (Section 1.1), Sampling Event Summaries (Section 1.2), and the Sampling and Analyses (Section 1.3) for both August 2008 sampling events.

### 1.1 Summary Criteria

#### 1.1.1 Monthly Sampling Event

Sampling Period: August 4 through 13, 2008

The purpose of this sampling was to collect data that can be used to evaluate the performance of all configurations of the ground water interim action well field. All sampling locations are shown on Figure 1.

**1. As a result of this sampling event, is there any indication of anomalous data that may be related to well field pump rate changes, river flow, or other known causes?**

Yes. The anomalous historical low sample analyses can be attributed to the prolonged increased river flow during the 2008 spring runoff.

**2. Were all interim action well field pumps operating within the planned parameters?**

Yes. Configurations (CFs) 1, 3, and 4 were pumping approximately 25, 45, and 31 gallons per minute (gpm), respectively, for a total well field extraction rate of approximately 100 gpm during this sampling event. CF1 was not operating due to poor well specific capacities.

**3. Was the evaporation pond functioning properly?**

Yes. The pond level remained at a level of 7.5 feet (ft) during this sampling event.

**4. Were all proposed well (ground water) and surface water locations sampled during this event?**

No. A large number of well point and surface water locations were not accessible due to the high river stage. Please refer to the Interim Action Trip Report (Attachment 1) for a detailed list of locations that were not sampled during this event.

**5. Were there any site activities that have impacted or may impact the interim action system?**

No.

**1.1.2 Wood Chip Area Sampling Event**

Sampling Period: August 25 through 27, 2008

The purpose of this sampling was to collect a series of ground water samples and one surface water sample in the area of the site commonly referred to as the wood chip area. It was in this vicinity of the site that miscellaneous debris, primarily in the form of wood chips saturated with tailings raffinate, were placed in an unlined disposal area. The majority of these locations (Figure 2) had not been sampled since 2002. One other monitoring well was sampled during this event that was not associated with the wood chip area, location TP-20. This location also had not been sampled since 2002; it is located within the vicinity property located south of the site boundary. This location was also sampled at this time as it provides pertinent data associated with the delineation of the uranium plume in that region of the site (Figure 2).

**1. As a result of this sampling event, is there any indication of anomalous data that may be related to well field pump rate changes, river flow, or other known causes?**

Yes. All anomalous data associated with this event were historic lows and can be attributed to the prolonged increased river flow during the 2008 spring runoff and/or gradual decreasing concentrations within the plume.

**2. Were all interim action well field pumps operating within the planned parameters?**

Not applicable. Sampling locations were not located in the vicinity of the well field.

**3. Was the evaporation pond functioning properly?**

Not applicable.

**4. Were all proposed well (ground water) and surface water locations sampled during this event?**

Yes.

**5. Were there any site activities that have impacted or may impact the interim action system?**

Not applicable.

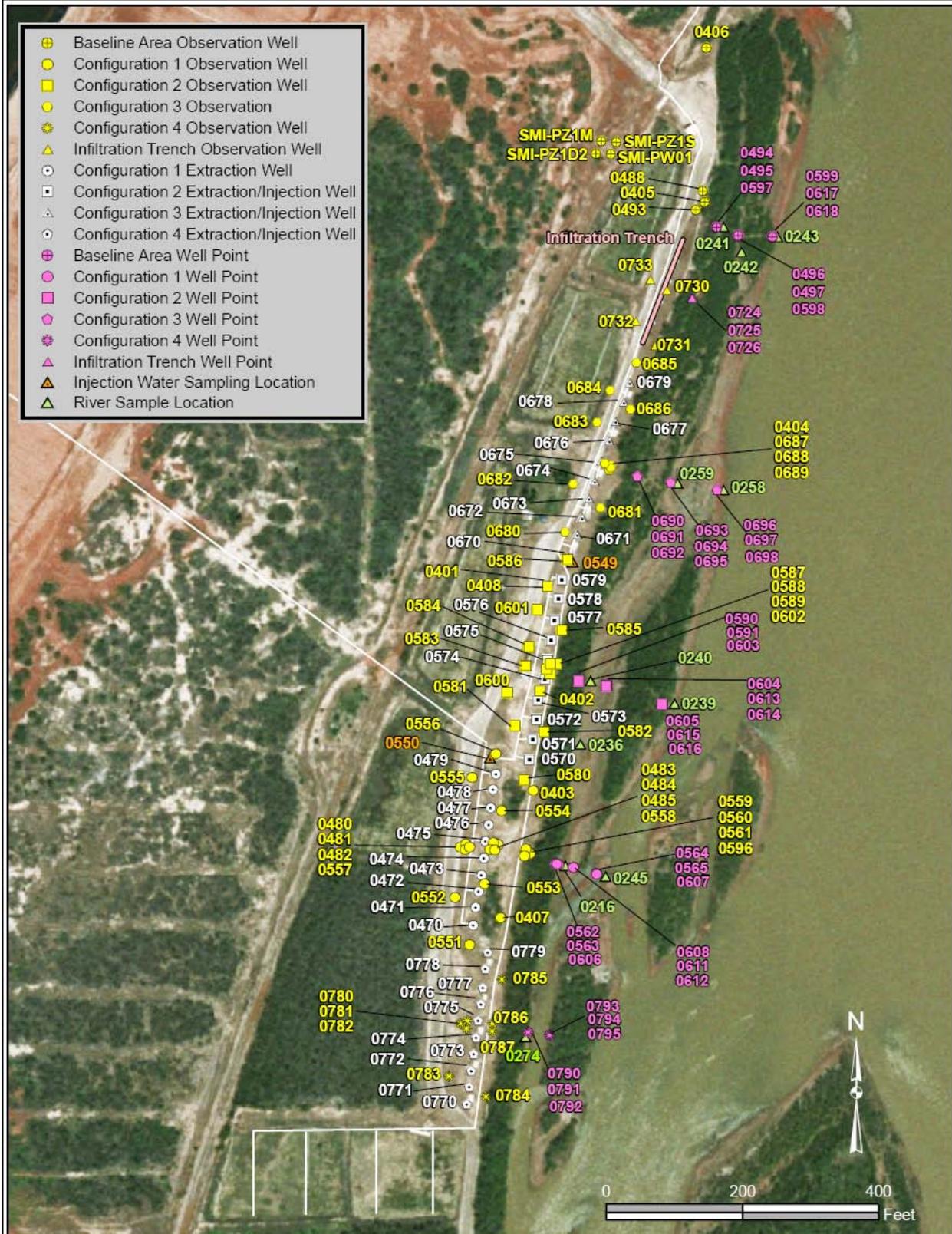


Figure 1. Sample Locations at the Interim Action Well Field and Baseline Area (may include locations not sampled)

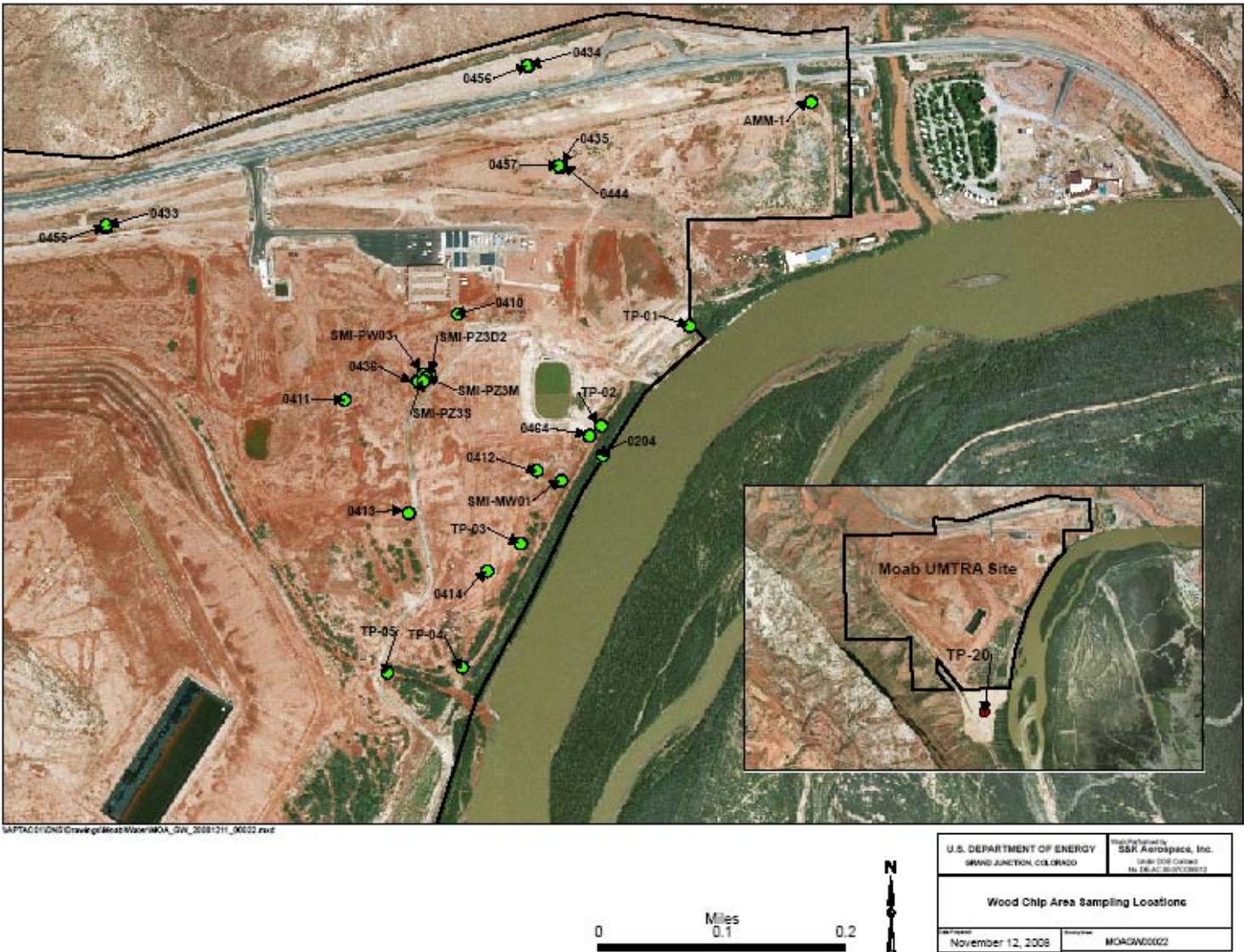


Figure 2. Sample Locations for the Wood Chip Area Sampling Event (may include locations not sampled)

## 1.2 Sampling Event Summaries

### 1.2.1 Monthly Sampling Event

This VDP presents the validated data associated with the ground water collected during the August 2008 interim action monthly sampling event at the former uranium tailings processing site in Moab, Utah. This VDP includes a discussion of the data validation process in Section 2.0 with a description of how these data are qualified based on field and laboratory verification assessments (Section 2.2). Attachment 1 contains the trip report detailing the field events associated with this sampling event.

A list of flagged data is presented in Table 5 in Section 2.2.1. No data were rejected (flagged as “R”) as a result of this validation process. Minimums and Maximums Reports (presented in Section 3.1.) were generated to determine if the data are within a normal statistical range. Any anomalous data, based on the results of the Minimums and Maximums Reports, are presented in Section 3.2.

While independent of the data validation process, a brief summary of the most recent concentration trends based on the August 2008 data is provided for CFs 3, 1, and 4 (listed from north to south) within the well field. Time versus concentration (ammonia, total dissolved solids [TDS], and uranium) plots for selected performance indicator monitoring wells located upgradient or downgradient within the interim action well field are presented to display historical trends exhibited by the data over the past 2 years. Colorado River flows over the same time frame are also plotted to determine whether the magnitude of river flows influences analyte concentrations.

### CF3

In August 2008, samples were collected only from wells 0682 (28 feet [ft] below ground surface [bgs]), 0688 (from 31 ft bgs), and 0689 (from 46 ft bgs). A review of the time versus ammonia, TDS, and uranium concentration plots (Figures 3, 4, and 5, respectively) for these CF3 locations suggests ammonia, TDS, and uranium concentrations started to rebound to prespring runoff concentrations in the sample collected from 31 ft bgs. There were no significant changes based on the results from the sample collected from location 0682 (from 28 ft bgs), and the sample collected from 31 ft bgs provided a mixture of results (ammonia and uranium concentrations decreased while TDS increased). Location 0682 was last sampled in May 2008, and either the freshwater lens resulting from infiltration of river water during high river stage did not reach the vicinity of the well (this location is an upgradient observation well) or ground water chemistry increased in concentrations after the dilution during high river stage.

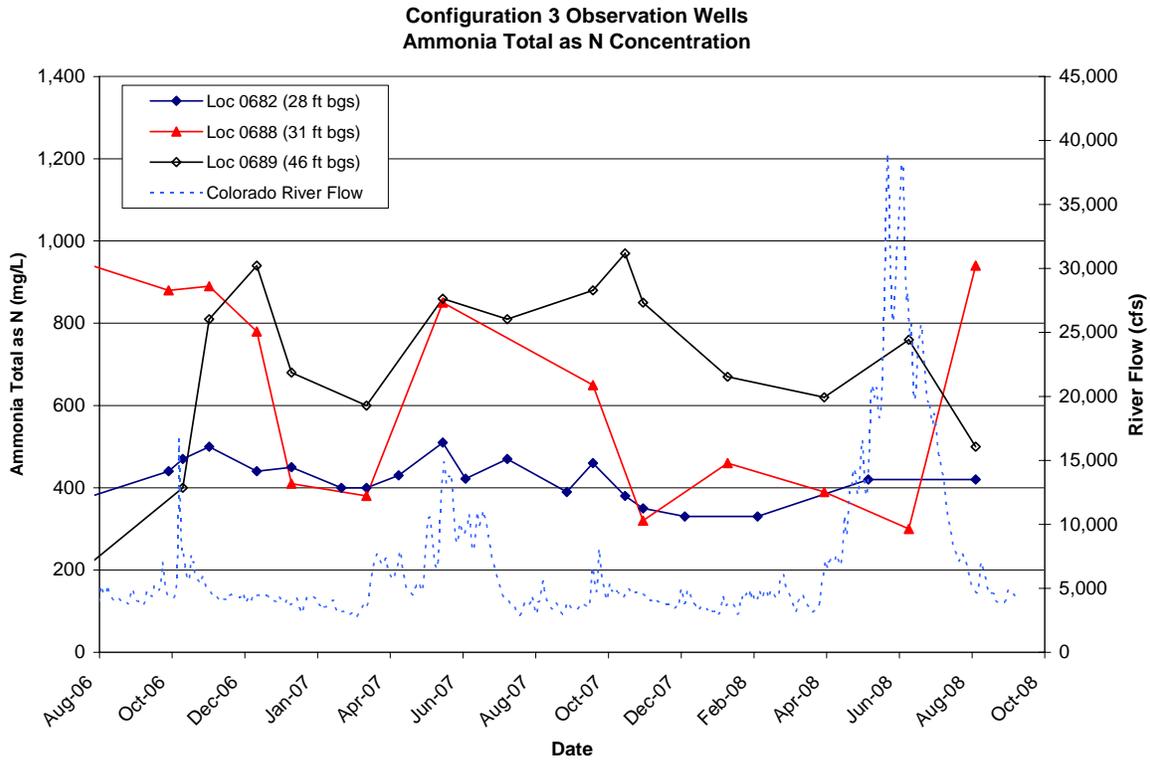


Figure 3. CF3 Observation Wells Time Versus Ammonia Total (as N) Concentration Plot

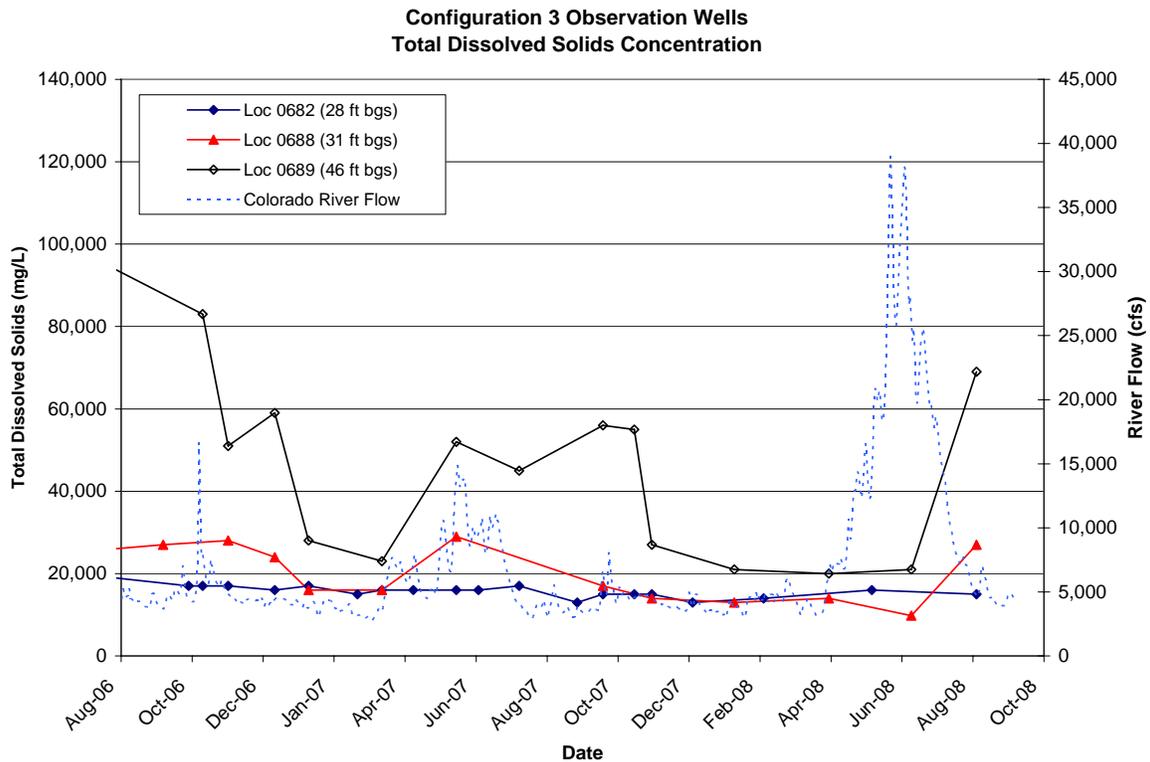


Figure 4. CF3 Observation Wells Time Versus TDS Concentration Plot

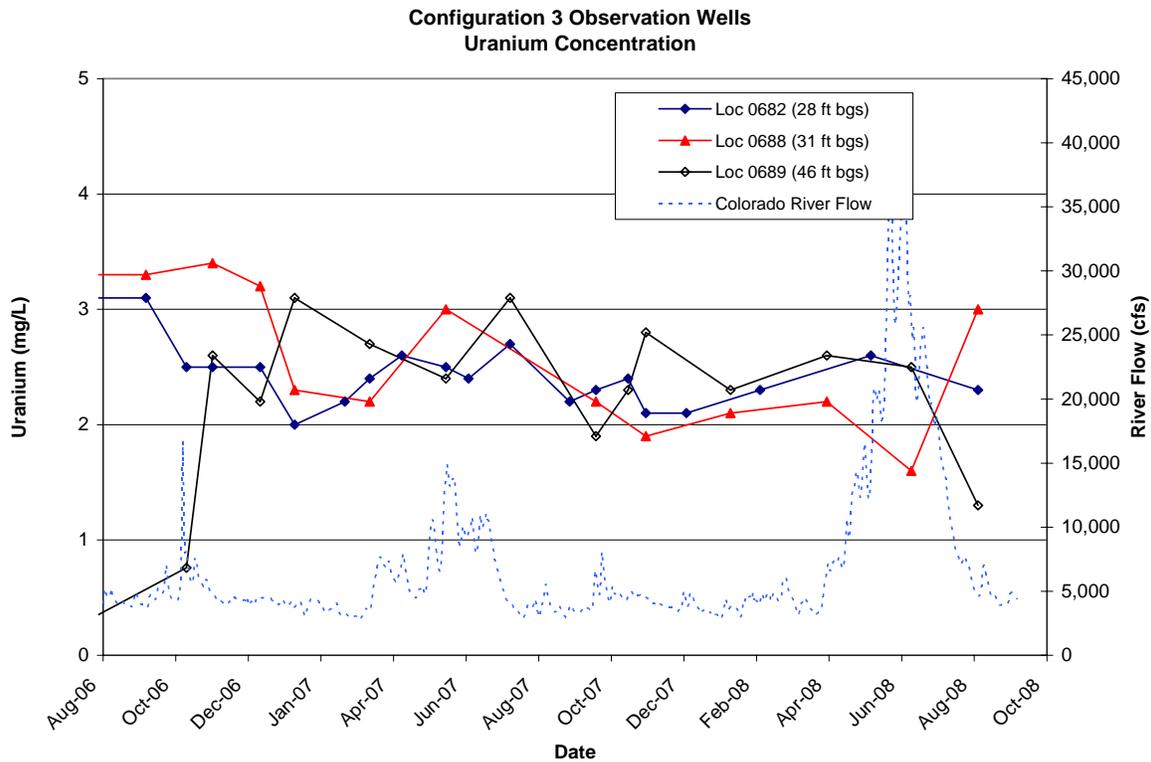


Figure 5. CF3 Observation Wells Time Versus Uranium Concentration Plot

## CF2

Of the locations typically discussed for CF2 in this section of the VDP, samples were collected from only location 0588 (34 ft bgs) during August 2008. Prior to the sample collected in August, the previous sample from this location was collected in May 2008. As a result, presenting a time concentration plot is not warranted in this VDP. Between May and August, ammonia increased from 380 to 440 milligrams per liter (mg/L), and TDS increased from 13,000 to 16,000 mg/L, respectively. Over the same period, the uranium concentration decreased from 2.6 to 2.0 mg/L in well 0588.

## CF1

Of the locations typically discussed for CF1 in this section of the VDP, samples were collected from only location 0483 (18 ft bgs) during the August 2008 observation wells. Prior to the sample collected in August, the previous sample from this location was collected in February 2008. As a result, presenting a time concentration plot is not warranted in this VDP. Please refer to the March 2008, April 2008, June 2008, and July 2008 VDPs for CF1 water chemistry information.

## Observation Wells 0403 and 0407

Samples were collected from observation wells 04030 and 0407 (which are located on the river bank within CF1) during the August 2008 sampling event. As shown in the time versus analyte concentration plots below (Figures 6, 7, and 8), the data suggests the analyte concentrations remained diluted from the presence of a freshwater lens (resulting from the extensive 2008 runoff) despite the relatively low river stage when the samples were collected.

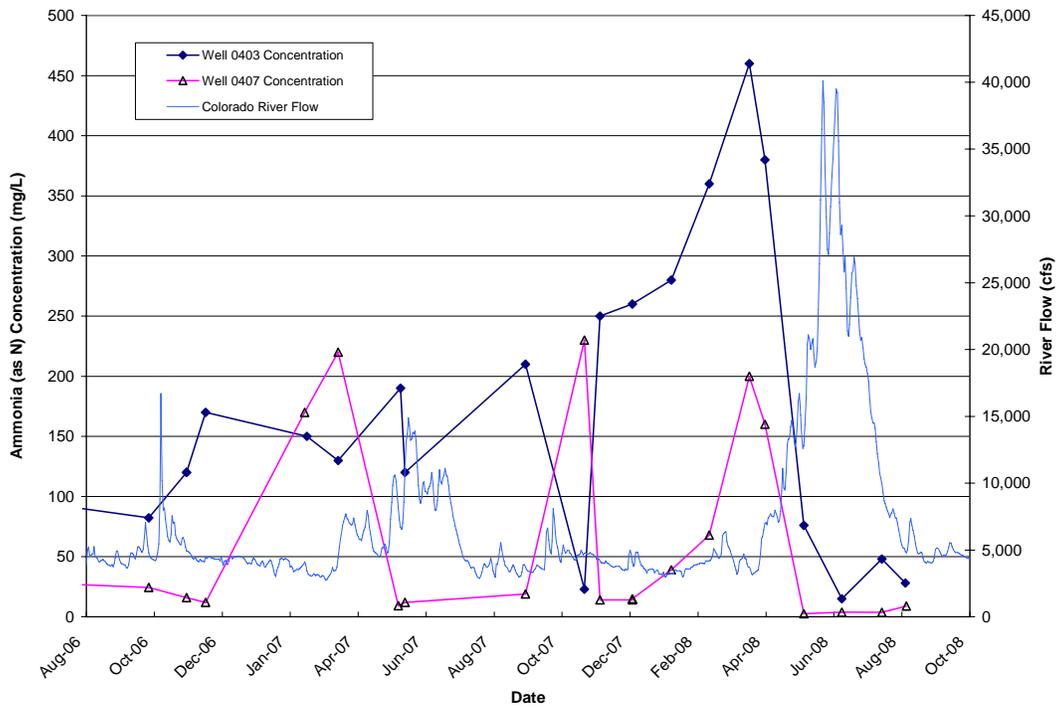


Figure 6. CF1 Observation Wells 0403 and 0407 Time Versus Ammonia Total (as N) Concentration Plot

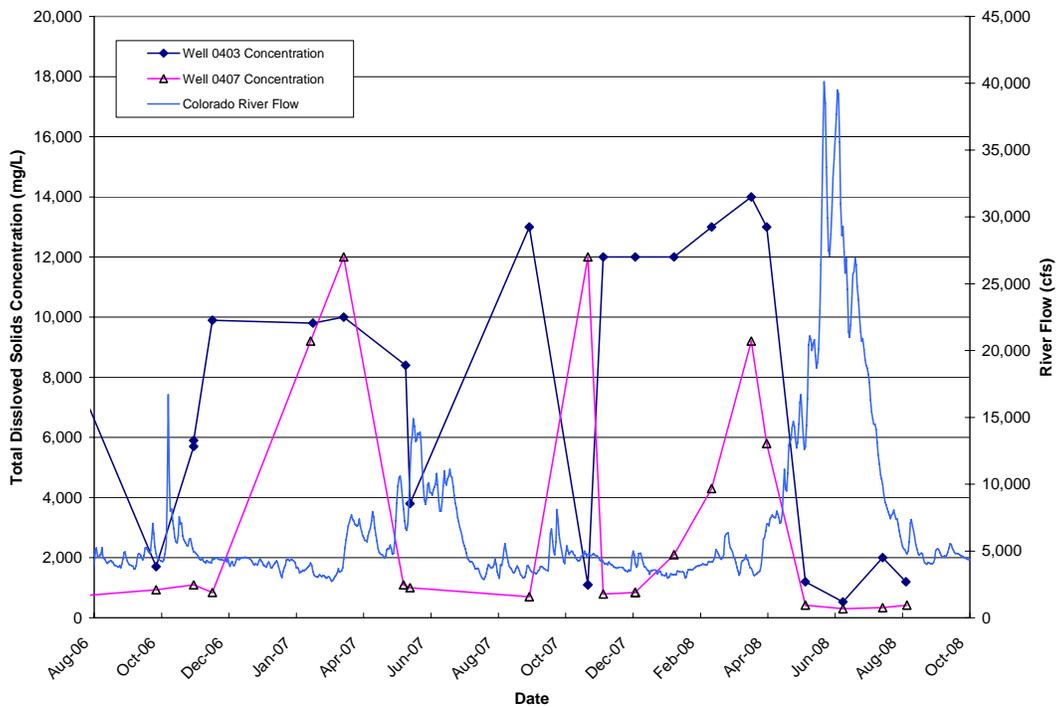


Figure 7. CF1 Observation Wells 0403 and 0407 Time Versus TDS Concentration Plot

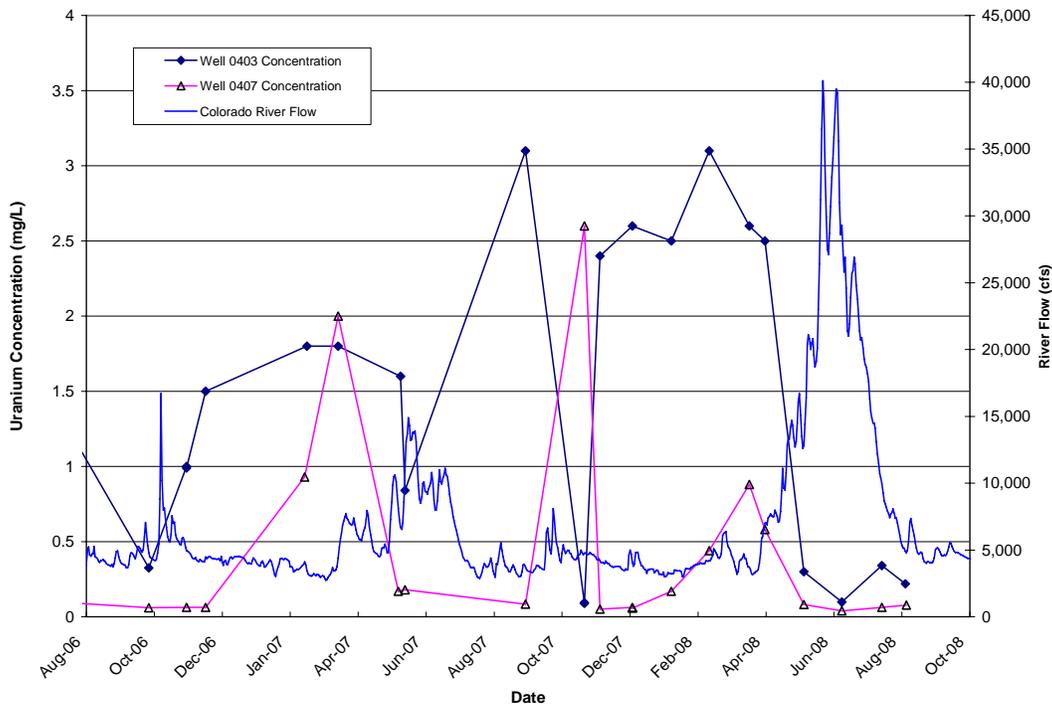


Figure 8. CF1 Observation Wells 0403 and 0407 Time Versus Uranium Concentration Plot

#### CF4

Of the locations typically included in these time versus concentration plots, during the August sampling event samples were collected only from location 0780 (28 ft bgs), and the standard plot could not be completely updated. This location was previously sampled in June 2008, and the analyte concentrations significantly rebounded towards prerunoff levels during this time period. Ammonia concentrations increased from 77 to 480 mg/L, TDS concentration increased from 1,000 to 15,000 mg/L, and uranium concentrations increased from 0.24 to 2.3 mg/L.

#### Surface Water Sampling Results

Table 1 presents a summary of the ammonia concentrations associated with the surface water samples collected during this sampling event. For comparison purposes, the applicable State of Utah and federal criteria for both acute and chronic concentrations (along with the temperature and pH data used to calculate these concentrations) are provided.

Table 1. Monthly Sampling Event Surface Water Ammonia Concentrations and Comparisons to State of Utah and Federal Criteria

Loc	Date	Temp (°C)	pH	Ammonia Total as N (mg/L)	State/Federal AWQC–Acute Total as N (mg/L) <sup>1</sup>	State/Federal AWQC–Chronic Total as N (mg/L) <sup>2</sup>
0216	8/12/08	24.11	8.11	0.1	4.64	1.14
0240	8/13/08	18.64	6.24	0.1	32.6	5.33

Notes: Loc = location, Temp = temperature, AWQC = ambient water quality criteria

(1) State of Utah, Standards of Quality for Waters of the State (Effective May 1, 2008), Rule R317-2, Table 2.14.2, 1-Hour Average (Acute) Concentration of Total Ammonia as N (mg/L)

(2) State of Utah, Standards of Quality for Waters of the State (Effective May 1, 2008), Rule R317-2, Table 2.14.2, 30-Day Average (Chronic) Concentration of Total Ammonia as N (mg/L), Fish Early Life Stages Present

As shown in Table 1, none of the surface water samples collected during the August 2008 monthly sampling event exceeded the state or federal acute or chronic criteria.

### 1.2.2 Wood Chip Area Sampling Event

This VDP also presents the August 2008 validated data associated with the wood chip area sampling event at the former uranium tailings processing site in Moab, Utah. This VDP includes a discussion of the data validation process in Section 2.0 with a description of how these data are qualified based on field and laboratory verification assessments (Section 2.2). Attachment 2 contains the trip report detailing the field events associated with this sampling event.

No data associated with this event were flagged, and no data were rejected (flagged as “R”) as a result of this validation process. Minimums and Maximums Reports (presented in Section 3.1) were generated to determine if the data are within a normal statistical range. Any anomalous data, based on the results of the Minimums and Maximums Reports, are presented in Section 3.2.

As previously mentioned, prior to this sampling event these locations had not been sampled since December 2002. Table 2 presents a summary of the results associated with the August 2008 sampling event compared to the previous event.

*Table 2. Comparison of Sampling Results from the Wood Chip Area*

Location	Uranium Concentrations (mg/L)	
	August 2008	December 2002
0411	19	no data
0412	5.8	12.2
0413	1.5	1.73 <sup>a</sup>
0414	5.3	3.18
AMM-1	0.007	0.01
SMI-MW01	5	13.2 <sup>b</sup>
SMI-PZ3S	1.4	3.24
TP-01	0.19	0.23
TP-02	2.3	13.0
TP-20	0.027	0.001

Notes: a – Result from sample collected September 2002  
 b – Result from sample collected November 2000

### Surface Water Sampling Results

Table 3 presents a summary of the ammonia concentrations associated with the surface water samples collected during this sampling event. For comparison purposes, the applicable State of Utah and federal criteria for both acute and chronic concentrations (along with the temperature and pH data used to calculate these concentrations) are provided.

*Table 3. Wood Chip Area Sampling Event Surface Water  
Ammonia Concentrations and Comparisons to State of Utah and Federal Criteria*

<b>Loc</b>	<b>Date</b>	<b>Temp (°C)</b>	<b>pH</b>	<b>Ammonia Total as N (mg/L)</b>	<b>State/Federal AWQC–Acute Total as N (mg/L)<sup>1</sup></b>	<b>State/Federal AWQC–Chronic Total as N (mg/L)<sup>2</sup></b>
0204	8/27/08	24.38	8.28	0.1	3.15	0.827

Notes: Loc = location, temp = Temperature, AWQC = ambient water quality criteria  
 (1) State of Utah, Standards of Quality for Waters of the State (Effective May 1, 2008), Rule R317-2, Table 2.14.2, 1-Hour Average (Acute) Concentration of Total Ammonia as N (mg/L)  
 (2) State of Utah, Standards of Quality for Waters of the State (Effective May 1, 2008), Rule R317-2, Table 2.14.2, 30-Day Average (Chronic) Concentration of Total Ammonia as N (mg/L), Fish Early Life Stages Present

As shown in Table 3, the surface water sample collected during this sampling event did not exceed the state or federal acute or chronic criteria.

### **1.3 Sampling and Analyses**

#### **1.3.1 Monthly Sampling Event**

Sampling and analyses were conducted in accordance with the *Operations, Maintenance, and Performance Monitoring Plan for the Interim Action Ground Water Treatment System, April 2008*. Although not listed here, the normal set of locations were sampled. Please refer to the associated trip report (Attachment 1) for specific sampled locations and an explanation of why some locations were not sampled, such as dry conditions at specific surface water locations.

The data validations indicate that the data meet the quality-control criteria specified for this project. An inadequate number of equipment blanks (EBs) and duplicates were collected. All samples were analyzed within their prescribed holding times. No significant discrepancies were noted regarding sample shipping and receiving, preservation, holding times, instrument calibration, method blanks, or matrix spikes (MSs), except as qualified or noted in the Laboratory Performance Assessments (Section 2.2).

There were four locations with six anomalous data points; three of the anomalous data points were associated with CF2 locations 0240 (historic high for manganese), 0586 (historic low for manganese), and 0590 (historic high for manganese), and the other data were associated with CF4 location 0771 (all historic lows for ammonia, manganese, and TDS). See the Anomalous Data Review (Section 3.2) for further details.

According to the USGS Cisco gaging station, the mean daily Colorado River flow rates varied between 4,600 and 6,610 cubic feet per second (cfs) during this sampling period.

#### **1.3.2 Wood Chip Area Sampling Event**

Sampling and analyses were conducted in accordance with the *Operations, Maintenance, and Performance Monitoring Plan for the Interim Action Ground Water Treatment System, April 2008*. Although not listed here, the normal set of locations were sampled. Please refer to the associated trip report (Attachment 2) for specific sampled locations and an explanation of why some locations were not sampled.

The data validations indicate that the data meet the quality-control criteria specified for this project. An adequate number of EBs and duplicates were collected; see the Water Sampling

Field Activities Verification Checklist for details. No significant discrepancies were noted regarding sample shipping and receiving, preservation times, holding times, instrument calibration, method blanks, or MSs, except as qualified or noted in the Laboratory Performance Assessments (Section 2.2).

There were four anomalous data points in this sampling event from locations 0412 (historic lows for ammonia, manganese, and uranium) and TP-01 (historic low for selenium). See Section 3.2 for more details. According to the USGS Cisco gaging station, the mean daily Colorado River flow rate was approximately 3,940 to 3,990 cfs during this sampling period.

## 2.0 Data Assessment Summaries

This section contains the Water Sampling Field Activities Verification (Section 2.1), the Laboratory Performance Assessments (Section 2.2), the Field Analyses/Activities (Section 2.3), and Certification (Section 2.4).

### 2.1 Water Sampling Field Activities Verifications

The field activities verification processes for these sampling events were documented. As the verification exhibits, all sampling was conducted following the applicable procedures. This verification is provided in Appendix A.

### 2.2 Laboratory Performance Assessments

#### 2.2.1 Monthly Sampling Event

##### General Information

Report Identification No. (RIN):	0808020
Sample Event:	Interim Action Well Field Monthly Sampling Event – August 2008
Site(s):	Moab, Utah
Laboratory:	Paragon Analytics, Fort Collins, Colorado
Sample Data Group (SDG) Nos.:	0808044 and 0808114
Analysis:	Metals and Inorganics
Validator:	Rebecca Hollis
Review Date:	September 24, 2008

This validation was performed according to the *Environmental Procedures Catalog*, “Standard Practice for Validation of Laboratory Data,” GT-9(P) (2006). The procedure was applied at Level 1, Data Deliverables Examination. The Level 1 validation was performed on 100 percent of the samples, which included review of the chain of custody (COC), case narratives, field and sample identifications, holding times, preservation, and cooler receipt. When the case narrative identified items of concern, these items were further investigated in a targeted Level 3 validation. All analyses were successfully completed. The samples were prepared and analyzed using accepted procedures based on methods specified by line item code, which are listed in Table 4.

Table 4. Interim Action Analytes and Methods

Analyte	Line Item Code	Preparation Method	Analytical Method
Ammonia	WCH-A-005	EPA 350.1	EPA 350.1
Bromide	MIS-A-038	SW-846 9056	SW-846 9056
Chloride	MIS-A-039	SW-846 9056	SW-846 9056
Copper	MET-A-020	SW-846 6010B	SW-846 6010B
Manganese	GJO-17	SW-846 6010B	SW-846 6010B
Selenium	GJO-14	SW-846 6020A	SW-846 6020A
Sulfate	MIS-A-044	SW-846 9056	SW-846 9056
TDS	WIC-A-033	MCAWW 160.1	MCAWW 160.1
Uranium	GJO-01	SW-846 6020A	SW-846 6020A

### Data Qualifier Summary

Analytical results were qualified as listed in Table 5. Refer to Table 6 for an explanation of the data qualifiers applied.

Table 5. Interim Action Data Qualifiers

Sample Number	Location	Analyte	Flag	Reason
All samples in SDG 0808114	All locations in SDG 0808114	Ammonia, Bromide, Chloride, Sulfate, TDS	J	P1
0808044-11 through 0808044-20 and 0808044-31 through 0808044-36	0547, 0548, 0552, 0559, 0582, 0583, 0586, 0588, 0670, 0673, 0772, 0774, 0776, 0779, 2357, and 2359	Ammonia	J	MS1
All samples in SDG 0808114	All locations in SDG 0808114	Chloride, Sulfate	J	RS1
All samples in SDG 0808114	All locations in SDG 0808114	Selenium, Uranium	J	MS1, RS1
All samples in SDG 0808114	All locations in SDG 0808114	Uranium	J	LCS1
0808114-1 and 0808114-2	0216 and 0240	All analytes	J	B1

Notes: Flags are for detects. See reason codes in Table 6 for nondetect codes.

Table 6. Interim Action Reason Codes for Data Flags

Reason Code	Qualifier (Detects)	Qualifier (Nondetects)	Explanation
B1	J	UJ	Results are considered estimated (J) because the blank frequency criteria were not met.
LCS1	J	UJ	Results for the affected analyte(s) are regarded as estimated (J) because the laboratory control sample was not analyzed at the proper frequency as stated in the appropriate analytical method.
MS1	J	UJ	Results for the affected analyte(s) are regarded as estimated (J) because the MS sample was (a) from another client, (b) of dissimilar matrix, (c) a field blank or EB, or (d) not analyzed at the proper frequency as stated in the appropriate analytical method.
P1	J	J	Results for the affected analyte(s) are regarded as estimated (J) because the samples were received outside the temperature criteria.
RS1	J	UJ	Results for the affected analyte(s) are regarded as estimated (J) because (a) the replicate sample, matrix spike duplicate, or laboratory control sample duplicate was not analyzed at the appropriate frequency for each matrix or for each data package, or (b) a field blank or EB was used for the replicate analysis.

### Sample Shipping/Receiving

Paragon Analytics in Fort Collins, Colorado, received a total of 48 samples for RIN 0808020. Thirty six samples arrived on August 7, 2008, for SDG 0808044 under UPS tracking number 1Z5W1Y510191938529. Twelve additional samples, assigned to SDG 0808114, arrived on August 14, 2008, under UPS tracking number 1Z5W1Y510192522510. All samples were accompanied by a COC form. The COC forms were checked to confirm that all of the samples were listed on each form with sample collection dates and times and that signatures and dates were present indicating sample relinquishment and receipt. The sample submittal documents, including the COC forms and the sample tickets, had no errors or omissions.

### Preservation and Holding Times

The sample shipments were received intact with the temperature within the coolers at 1.4 °C and 1.8 °C for SDG 0808044 and at 5.2 °C for SDG 0808144. The temperature of the cooler for SDG 0808114 was above the maximum allowed temperature of 4 °C. Therefore, all ammonia, bromide, chloride, sulfate, and TDS results were “J”-flagged for SDG 0808114. All samples were received in the correct container types and had been preserved correctly for the requested analyses with the exception of the ammonia sample 0808044-20. This sample was received at pH 7. Sulfuric acid was added to this sample by the laboratory upon receipt, and the sample was allowed to equilibrate. No qualification was required. All samples were analyzed within the applicable holding times.

### Case Narratives

The case narratives were reviewed and all detects were found to be within quality-control procedures except for the following.

### **MS and Replicate Analysis**

MS sample analysis, performed at a frequency of one per 20 samples unless otherwise noted, is performed as a measure of the ability to recover analytes in a particular matrix. Replicate analysis consists of matrix spike duplicate (MSD) samples and field duplicates analyzed at a frequency of one per 20 samples per method or procedural requirements. These replicate samples are indicators of laboratory precision for each sample matrix.

### **Method EPA 350.1, Ammonia**

For ammonia as N analysis, only two MSs were analyzed for the 36 samples in SDG 0808044, although method 350.1 requires MSs to be analyzed for at least 10 percent of the samples. The two MSs performed had ammonia concentrations in the native samples greater than four times the spike concentrations. Based on validation protocol, qualification requirements are not applicable when the native sample concentration exceeds four times the spike concentration. Therefore, “J” qualification was only required for SDG 0808044 samples 0808044-11 through 0808044-20 and 0808044-31 through 0808044-36 because an insufficient number of MSs were performed.

Per validation procedure requirements, one replicate is required for every preparation batch. Two preparation batches were prepared for SDG 0808044, and MSDs were prepared in both. However, the results of both MSDs were out of the analytical range of the instrument and hence no relative percent difference (RPD) could be calculated. Two field duplicates were analyzed with SDG 0808044 (see field duplicate section below for details.) These duplicates passed the acceptance criteria of  $\pm 20$  RPD for ammonia. Therefore, no ammonia samples were qualified for SDG 0808044 because of lack of replicate results.

One MS was analyzed for the 12 samples in SDG 0808144, although method 350.1 requires MSs to be analyzed for at least 10 percent of the samples. Based on professional judgment, the frequency of one per 12 samples was deemed acceptable, and qualification was not required.

The RPD for the MS/MSD results for SDG 0808114 was acceptable; hence no qualification was required for replicate analysis.

### **Method SW-846 9056, Chloride**

The chloride concentrations in the native samples selected as the MS and MSD were above the analytical range for both SDGs. Based on validation protocol, qualification requirements are not applicable when the native sample concentration exceeds four times the spike concentration. Therefore, no qualification was required.

Neither SDG met replicate requirements based on MSD results because the results were out of the analytical range of the instrument, so no RPD could be calculated. For SDG 0808044, two field duplicates were analyzed which met the precision requirements (see field duplicate section below for details). Therefore, no qualification was required for SDG 0808044, but all samples in SDG 0808114 were “J”-qualified.

### **Method SW-846 6020A, Selenium**

No MS or MSD was prepared for the selenium analysis for SDG 0808114. All associated selenium results were “J”-flagged for this SDG.

### **Method SW-846 9056, Sulfate**

The sulfate concentrations in the native samples selected as the MSs and MSDs were above the analytical range for both SDGs. Based on validation protocol, qualification requirements are not applicable when the native sample concentration exceeds four times the spike concentration. Therefore, no qualification was required.

Neither SDG met replicate requirements based on MSD results because the results were out of the analytical range of the instrument, so no RPD could be calculated. For SDG 0808044, two field duplicates were analyzed which met the precision requirements (see field duplicate section below for details). Therefore, no qualification was required for SDG 0808044, but all samples in SDG 0808114 were “J”-qualified.

### **Method SW-846 6020A, Uranium**

No MS or MSD was prepared for the uranium analysis for SDG 0808114. All associated uranium results were “J”-flagged for this SDG.

### **Field Duplicates**

Two field duplicates were collected from sample locations 0403 and 0552 and were analyzed with SDG 0808044. These duplicates were labeled with the false location identifications 2357 and 2359, respectively. The RPD was calculated for the original sample results and their duplicates, and both sets passed the acceptance criteria of  $\pm 20$  RPD for all analytes.

### **Laboratory Control Samples**

A laboratory control sample (LCS) must be analyzed at the correct frequency (one LCS per 20 samples) to provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. LCSs were prepared and analyzed as appropriate with the following exception.

LCSs were not reported for copper, manganese, selenium, or uranium. As a standard practice, Paragon Analytics does not prepare LCSs for samples that were field filtered and acidified and then run directly on the instrument without any additional sample preparation. Per national environmental laboratory accreditation requirements, an MS may be used in place of an LCS provided the acceptance criteria are as stringent. See the MS and Replicate Analysis section of this report for required qualification.

### **Detection Limits/Dilutions**

The required detection limit (RDL) for all analytes was achieved for all SDGs. Serial dilution samples were required for inductively coupled plasma (ICP) sample analysis (copper, manganese, selenium, and uranium). The percent difference of the serial dilutions and the associated native samples were acceptable for all ICP analyses with the following exceptions.

No serial dilutions were prepared for uranium or selenium analysis for SDG 0808114. However, a serial dilution for uranium and selenium from SDG 0808044 in this same RIN was analyzed in the analytical run, and so no qualifications needed to be made.

### **Method and Calibration Blanks**

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. Calibration blanks are analyzed to assess instrument contamination prior to and during

sample analysis. Detected sample results associated with blanks results greater than the method detection limit (MDL) or instrument detection limit (IDL) (depending on method requirements) were “J”-qualified when the detections were less than five times the blank concentration. Nondetects were not qualified. All blanks passed these criteria with the following exceptions: One or more calibration blanks for sulfate and chloride were greater than the practical quantitation limit (PQL). However, none of the results bounded by these continuing calibration blanks required qualification because their concentrations were greater than 10 times the blank concentration.

### **EBs**

EBs are samples of analyte-free media that have been used to rinse the nondedicated sampling equipment, which is used to sample surface water. EBs are collected to document adequate decontamination of nondedicated equipment. EBs are considered to be preparation blanks, and one EB should be prepared with each preparation batch.

### **Surface Water**

The only samples collected on nondedicated equipment were surface water samples from locations 0216 (sample 0808114-1) and 0240 (sample 0808114-2). Since no EBs were collected, all results from these locations were “J”-qualified.

### **Completeness**

Results were reported in the correct units for all analytes requested using contract-required laboratory qualifiers.

### **Electronic Data Deliverable File**

The Electronic Data Deliverable (EDD) files arrived on September 4 and September 9, 2008. The contents of the EDD were manually examined to verify that the sample results accurately reflect the data contained in the SDG and that all and only the requested data were delivered.

## **2.2.2 Wood Chip Area Sampling Event**

### **General Information**

RIN:	0808021
Sample Event:	Wood Chip Area Sampling Event, August 2008
Site(s):	Moab, Utah
Laboratory:	Paragon Analytics, Fort Collins, Colorado
SDG No.:	0808234
Analysis:	Metals and Inorganics
Validator:	Rebecca Hollis
Review Date:	November 7, 2008

This validation was performed according to the *Environmental Procedures Catalog*, “Standard Practice for Validation of Laboratory Data,” GT-9(P) (2006). The procedure was applied at Level 1, Data Deliverables Examination. The Level 1 validation was performed on 100 percent of the samples, which included review of the COC, case narratives, field and sample identifications, holding times, preservation, and cooler receipt. When the case narrative identified items of concern, these items were further investigated in a targeted Level 3 validation.

All analyses were successfully completed. The samples were prepared and analyzed using accepted procedures based on methods specified by line item code, which are listed in Table 7.

Table 7. Wood Chip Area Analytes and Methods

Analyte	Line Item Code	Preparation Method	Analytical Method
Ammonia	WCH-A-005	EPA 350.1	EPA 350.1
Bromide	MIS-A-038	SW-846 9056	SW-846 9056
Chloride	MIS-A-039	SW-846 9056	SW-846 9056
Manganese	GJO-17	SW-846 6010B	SW-846 6010B
Selenium	GJO-14	SW-846 6020A	SW-846 6020A
Sulfate	MIS-A-044	SW-846 9056	SW-846 9056
TDS	WIC-A-033	MCAWW 160.1	MCAWW 160.1
Uranium	GJO-01	SW-846 6020A	SW-846 6020A

### Data Qualifier Summary

It was not necessary to qualify any of the analytical results associated with this sampling event.

### Sample Shipping/Receiving

Paragon Analytics in Fort Collins, Colorado, received a total of 12 samples for RIN 0808021 on August 28, 2008. These samples were shipped, under UPS tracking number 1Z5W1Y510192826568 and were assigned to SDG 0808234. All samples were accompanied by a COC form. The COC forms were checked to confirm that all of the samples were listed on each form with sample collection dates and times and that signatures and dates were present indicating sample relinquishment and receipt. The sample submittal documents, including the COC forms and the sample tickets, had no errors or omissions with the following exception.

The COC listed the sample time for sample 0808234-9 as 10:10. All four sample bottles listed the time as 10:20. Paragon used a time of 10:10 which was consistent with the COC and sample ticket. No qualification was required for this error.

### Preservation and Holding Times

The sample shipments were received intact with the temperature within the cooler at 1.4 °C, which is within the temperature acceptance range. All samples were received in the correct container types and had been preserved correctly for the requested analyses. All samples were analyzed within the applicable holding times.

### Case Narratives

The case narratives were reviewed, and all detects were found to be within quality-control procedures except for the following.

### MS and Replicate Analysis

MS sample analysis, performed at a frequency of one per 20 samples unless otherwise noted, is performed as a measure of the ability to recover analytes in a particular matrix. Replicate analysis consists of MSD samples and field duplicates, analyzed at a frequency of one per 20 samples per method or procedural requirements. These replicate samples (RSs) are indicators of laboratory precision for each sample matrix.

### **Method EPA 350.1, Ammonia**

For ammonia as N analysis, one MS was analyzed for the 12 samples in SDG 0808234, although method 350.1 requires MSs to be analyzed for at least 10 percent of the samples. Based on professional judgment, this frequency was deemed acceptable. The MS performed had ammonia concentrations in the native sample greater than four times the spike concentration. Based on validation protocol, qualification requirements are not applicable when any associated sample's native concentration exceeds four times the spike concentration. Therefore, no qualification was required.

Per validation procedure requirements, one replicate is required for every preparation batch. As mentioned above, the results of the native sample used for the MS and MSD was greater than four times the spike concentrations and, therefore, were not reported. However, a field duplicate was analyzed with this SDG (see field duplicate section below for details.) The duplicate passed the acceptance criteria of  $\pm 20$  RPD for ammonia. Therefore, no ammonia samples were qualified because of lack of replicate results.

### **Method SW-846 9056, Chloride**

The chloride concentrations in the native samples selected as the MS and MSDs were above the analytical range. Based on validation protocol, qualification requirements are not applicable when the native sample concentration exceeds four times the spike concentration. Therefore, no qualification was required.

Per validation procedure requirements, one replicate is required for every preparation batch. As mentioned above, the concentration of the native sample used for the MS and MSD was greater than four times the spike concentrations and, therefore, were not reported. However, a field duplicate was analyzed with this SDG (see field duplicate section below for details). The duplicate passed the acceptance criteria of  $\pm 20$  RPD. Therefore, no chloride samples were qualified because of lack of replicate results.

### **Method SW-846 9056, Sulfate**

The sulfate concentrations in the native samples selected as the MSs and MSDs were above the analytical range. Based on validation protocol, qualification requirements are not applicable when the native sample concentration exceeds four times the spike concentration. Therefore, no qualification was required.

Per validation procedure requirements, one replicate is required for every preparation batch. As mentioned above, the concentration of the native sample used for the MS and MSD was greater than four times the spike concentrations and, therefore, were not reported. However, a field duplicate was analyzed with this SDG (see field duplicate section below for details). The duplicate passed the acceptance criteria of  $\pm 20$  RPD. Therefore, no sulfate samples were qualified because of lack of replicate results.

### **Field Duplicates**

One field duplicate was collected from sample location TP-01 (sample number 0808234-10). This duplicate was labeled with the false location identification 2118 (sample number 0808234-2). The RPD between the original sample result and its duplicate passed the acceptance criteria of  $\pm 20$  RPD for all analytes.

## **LCS**

An LCS must be analyzed at the correct frequency (one LCS per 20 samples) to provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. LCSs were prepared and analyzed as appropriate with the following exception.

LCSs were not reported for manganese or uranium. As a standard practice, Paragon Analytics does not prepare LCSs for samples that are field filtered and acidified and then run directly on the instrument without any additional sample preparation. Per national environmental laboratory accreditation requirements, an MS may be used in place of an LCS provided the acceptance criteria are as stringent. Both manganese and uranium MSs were acceptable, and so took the place of the LCSs.

## **Detection Limits/Dilutions**

The RDL for all analytes was achieved for all SDG.

Serial dilution samples were required for ICP sample analysis (copper, manganese, selenium, and uranium). The percent difference of the serial dilutions and the associated native samples were acceptable for all ICP analyses.

## **Method and Calibration Blanks**

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. Calibration blanks are analyzed to assess instrument contamination prior to and during sample analysis. Detected sample results associated with blanks results greater than the MDL or IDL (depending on method requirements) were “J”-qualified when the detections were less than five times the blank concentration. Nondetects were not qualified. All blanks passed these criteria with the following exception.

One calibration blank for chloride on September 2, 2008, was greater than the PQL. However, no results that exceeded the acceptance limits were reported from results bracketed by this blank.

## **EBs**

EBs are samples of analyte-free media that have been used to rinse the nondedicated sampling equipment, which is used to sample surface water. EBs are collected to document adequate decontamination of nondedicated equipment. One EB should be prepared with each preparation batch.

All samples were collected using dedicated equipment; therefore, an EB was not required for this sampling event.

## **Completeness**

Results were reported in the correct units for all analytes requested using contract-required laboratory qualifiers.

## **EDD File**

The EDD files arrived on September 23, 2008. The contents of the EDD were manually examined to verify that the sample results accurately reflect the data contained in the sample data package and that all and only the requested data were delivered.

## **2.3 Field Analyses/Activities**

### **2.3.1 Monthly Sampling Event**

The following information summarizes the field analyses and activities for the August 2008 monthly sampling event.

#### **Field Activities**

All monitor wells were purged and sampled using the low-flow sampling method; this method was not used at extraction wells. Two duplicate samples were collected. There are no established regulatory criteria for the evaluation of field duplicate samples; therefore, Environmental Protection Agency (EPA) guidance for laboratory duplicates (which is conservative for field duplicates) was used to assess the precision of the field duplicates. All results met the criteria of  $\pm 20$  RPD and are considered acceptable.

### **2.3.2 Wood Chip Area Sampling Event**

The following information summarizes the field analyses and activities for the August 2008 wood chip area sampling event.

#### **Field Activities**

All monitor wells were purged and sampled using the low-flow sampling method; this method was not used at extraction wells. All ground water samples were collected on dedicated equipment. One duplicate sample was collected. 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. All results met the EPA criteria of  $\pm 20$  RPD and are considered acceptable.

## **2.4 Certification**

Results were reported in correct units for all analytes requested. Appropriate contract-required laboratory qualifiers and target analyte lists were used. The RDLs were met when possible, or an explanation of why they were not met was given in the laboratory case narrative. 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 EPA *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.

### 3.0 Data Presentation

This section contains the Minimums and Maximums Reports (Section 3.1), the Anomalous Data Review (Section 3.2), Water Quality Data and Water Level Data (Sections 3.3 and 3.4, respectively), and the Blanks Reports (Section 3.5).

#### 3.1 Minimums and Maximums Reports

The Minimums and Maximums Reports (see Appendix B) are generated by the Sample Management System used to query the SEEPro database. The DataVal program compares the new data set with historical data and lists all new data that fall outside the historical data range. Values listed in the reports are further screened, and the results are not considered anomalous if: (1) identified low concentrations are the result of low detection limits; (2) the concentration detected is within 50 percent of historical minimum or maximum values; or (3) there were fewer than five historical samples for comparison.

#### 3.2 Anomalous Data Review

##### Monthly Sampling Event

As exhibited by the Minimums and Maximums Reports, there are six anomalous data points associated with the August 2008 monthly sampling event.

**Site:** Moab UMTRA Site      **Sampling Dates:** August 4 - 13, 2008

<b>Loc. No.</b>	<b>Analyte</b>	<b>Type of Anomaly</b>	<b>Disposition</b>
0240	Manganese	High	Fewer than 10 samples collected from this location, still establishing analyte range.
0586	Manganese	Low	Analyte dilution in response to spring runoff.
0590	Manganese	High	Fewer than 10 samples collected from this location, still establishing analyte range.
0771	Ammonia	Low	Analyte dilution in response to spring runoff.
0771	Manganese	Low	Analyte dilution in response to spring runoff.
0771	TDS	Low	Analyte dilution in response to spring runoff.

### Wood Chip Area Sampling Event

As exhibited by the Minimums and Maximums Reports, there are four anomalous data points associated with the August 2008 wood chip area sampling event.

**Site:** Moab UMTRA Site      **Sampling Date:** August 25 - 27, 2008

<b>Loc. No.</b>	<b>Analyte</b>	<b>Type of Anomaly</b>	<b>Disposition</b>
0412	Ammonia	Low	Fewer than 10 samples collected from this location, still establishing analyte range.
0412	Manganese	Low	Fewer than 10 samples collected from this location, still establishing analyte range.
0412	Uranium	Low	Fewer than 10 samples collected from this location, still establishing analyte range.
TP-01	Selenium	Low	Fewer than 10 samples collected from this location, still establishing analyte range.

### 3.3 Water Quality Data

All water quality data are presented in Appendix C.

### 3.4 Water Level Data

All water level data are presented in Appendix D.

### 3.5 Blanks Reports

#### Monthly Sampling Event

Only two surface water samples were collected using nondedicated tubing that was thoroughly cleaned between locations; prior to collecting the sample, approximately 5 gallons of surface water was flushed through the tubing.

#### Wood Chip Area Sampling Event

All samples were collected on dedicated equipment; therefore, an EB was not required or collected.

**Appendix A.**  
**Water Sampling Field Activities Verification**

## Appendix A. Water Sampling Field Activities Verification

<b>Sampling Event / RIN</b>	<u>August 2008/0808020</u>	<b>Date(s) of Water Sampling</b>	<u>August 4 - 13, 2008</u>
<b>Date(s) of Verification</b>	<u>September 30, 2008</u>	<b>Name of Verifier</b>	<u>Rachel Cowan</u>
		<b>Response (Yes, No, NA)</b>	<b>Comments</b>
1. Is the Sampling Analysis Plan the primary document directing field procedures? List other documents, standard operating procedures, instructions.		<u>Yes</u>	
		<u>NA</u>	
2. Were the sampling locations specified in the planning documents sampled?		<u>No</u>	<u>See Section 1.1 for explanation.</u>
3. Was a pretrip calibration conducted as specified in the aforementioned documents?		<u>Yes</u>	
4. Was an operational check of the field equipment conducted twice daily?  Did the operational checks meet criteria?		<u>Yes</u>	
		<u>Yes</u>	
5. Were the number and types (alkalinity, temperature, electrical conductivity, pH, turbidity, dissolved oxygen, oxidation reduction potential) of field measurements taken as specified?		<u>Yes</u>	
6. Was the category of the well documented?		<u>Yes</u>	
7. Were the following conditions met when purging a Category I well: Was one pump/tubing volume purged prior to sampling?  Did the water level stabilize prior to sampling? Did pH, specific conductance, and turbidity measurements stabilize prior to sampling?  Was the flow rate less than 500 milliliters per minute? If a portable pump was used, was there a 4-hour delay between pump installation and sampling?		<u>Yes</u>	
		<u>NA</u>	
8. Were the following conditions met when purging a Category II well:  Was the flow rate less than 500 milliliters per minute? Was one pump/tubing volume removed prior to sampling?		<u>Yes</u>	
		<u>Yes</u>	

## Appendix A. Water Sampling Field Activities Verification (continued)

9. Were duplicates taken at a frequency of one per 20 samples?	No	Forty-eight samples were collected, but only two duplicates were collected.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	No	Two surface water samples were collected on nondedicated equipment, but no equipment blanks were collected .
11. Were trip blanks prepared and included with each shipment of volatile organic compound samples?	NA	
12. Were quality-control 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 COC 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	

## Appendix A. Water Sampling Field Activities Verification (continued)

Sampling Event / RIN	August 2008 Monthly Event Wood Chip Area Sampling/0808021	Date(s) of Water Sampling	August 25 - 27, 2008
Date(s) of Verification	November 7, 2008	Name of Verifier	Rachel Cowan
		Response (Yes, No, NA)	Comments
1.	Is the Sampling Analysis Plan the primary document directing field procedures? List other documents, standard operating procedures, instructions.	Yes _____ NA _____	
2.	Were the sampling locations specified in the planning documents sampled?	NA	This area was sampled at DOE's request to determine current analyte concentrations outside the interim action well field, and there was no planning document.
3.	Was a pretrip calibration conducted as specified in the aforementioned documents?	Yes _____	
4.	Was an operational check of the field equipment conducted twice daily?  Did the operational checks meet criteria?	Yes _____ Yes _____	
5.	Were the number and types (alkalinity, temperature, electrical conductivity, pH, turbidity, dissolved oxygen, oxidation reduction potential) 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?  Did the water level stabilize prior to sampling?  Did pH, specific conductance, and turbidity measurements stabilize prior to sampling?  Was the flow rate less than 500 milliliters per minute? If a portable pump was used, was there a 4-hour delay between pump installation and sampling?	Yes _____ Yes _____ Yes _____ Yes _____	Problems meeting turbidity criteria in various locations as noted in field book.
8.	Were the following conditions met when purging a Category II well:  Was the flow rate less than 500 milliliters per minute? Was one pump/tubing volume removed prior to sampling?	Yes _____ Yes _____	
9.	Were duplicates taken at a frequency of one per 20 samples?	Yes	Twelve samples were collected, and one duplicate sample was collected.

## Appendix A. Water Sampling Field Activities Verification (continued)

10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	NA	All samples were collected on dedicated equipment.
11. Were trip blanks prepared and included with each shipment of volatile organic compound samples?	NA	
12. Were quality-control 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 COC 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	

**Appendix B.**  
**Minimums and maximums Reports**

## Appendix B. Minimums and Maximums Reports

### August 2008 Monthly Sampling Event - Data Validation Minimums and Maximums Report - No Field Parameters

Laboratory: PARAGON (Fort Collins, CO)

RIN: 0808020

Comparison: All Historical Data

Report Date: 9/30/2008

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	0216	08/12/2008	Manganese	0.0025	B	2.97		0.0037	B		15	1	
MOA01	0240	08/13/2008	Manganese	0.57		0.22		0.0032	B	J	9	1	
MOA01	0470	08/04/2008	Manganese	1.1		5	F	1.6			11	0	
MOA01	0482	08/05/2008	Ammonia Total as N	360		1200		500		F	26	0	
MOA01	0482	08/05/2008	Sulfate	8400		7400	J	5300		J	26	0	
MOA01	0552	08/06/2008	Manganese	5.6		5.3	J	4.5		J	8	0	
MOA01	0552	08/06/2008	Manganese	6.1		5.3	J	4.5		J	8	0	
MOA01	0583	08/05/2008	Manganese	1.8		5.3	J	2.8		J	15	0	
MOA01	0586	08/05/2008	Manganese	1.3		5.9	F	3.1		J	7	0	
MOA01	0590	08/13/2008	Manganese	4.6		2.3		0.57		J	10	0	
MOA01	0606	08/12/2008	Sulfate	290		5420	QF	346		JQF	19	0	
MOA01	0606	08/12/2008	Total Dissolved Solids	750		12000		941		QF	19	0	
MOA01	0731	08/06/2008	Chloride	430		350	F	50		J	9	0	
MOA01	0731	08/06/2008	Uranium	0.88		0.79	J	0.022		J	9	0	
MOA01	0771	08/04/2008	Ammonia Total as N	87		950	F	230			9	0	

## Appendix B. Minimums and Maximums Reports (continued)

### August 2008 Monthly Sampling Event - Data Validation Minimums and Maximums Report - No Field Parameters

Laboratory: PARAGON (Fort Collins, CO)

RIN: 0808020

Comparison: All Historical Data

Report Date: 9/30/2008

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	0771	08/04/2008	Chloride	1300		43000	F	2300	F	9	0
MOA01	0771	08/04/2008	Manganese	1		6.7	F	3.2		6	0
MOA01	0771	08/04/2008	Sulfate	2300		9800	F	3900		9	0
MOA01	0771	08/04/2008	Total Dissolved Solids	5300		82000	F	13000	JF	9	0

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

#### LAB QUALIFIERS:

- \* Replicate analysis not within control limits.
- > Result above upper detection limit.
- A Tentatively identified compound (TIC) is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and contract-required detection limit. Organic: Analyte also found in method blank.
- D Analyte determined in diluted sample.
- E Inorganic: Estimate value because of interference, see case narrative.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- J Estimated.
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: TIC.
- P > 25% difference in detected pesticide or Aroclor concentrations between two columns.
- U Analytical result below detection limit.
- W Postdigestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- X,Y,Z Laboratory defined qualifier, see case narrative.

#### DATA QUALIFIERS:

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

## Appendix B. Minimums and Maximums Reports (continued)

### August 2008 Wood Chip Area - Data Validation Minimums and Maximums Report - No Field Parameters

Laboratory: PARAGON (Fort Collins, CO)

RIN: 0808021

Comparison: All Historical Data

Report Date: 11/6/2008

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	0412	08/26/2008	Ammonia Total as N	0.31		1.281	F	0.955	F	5	0
MOA01	0412	08/26/2008	Chloride	390		758	F	714	F	5	0
MOA01	0412	08/26/2008	Manganese	0.0028	B	0.0676	UF	0.0564	F	5	2
MOA01	0412	08/26/2008	Selenium	0.064		0.1	F	0.0902	F	5	0
MOA01	0412	08/26/2008	Sulfate	880		1390	F	1260	F	5	0
MOA01	0412	08/26/2008	Uranium	5.8		12.8	F	12.2	F	5	0
MOA01	SMI-PZ3S	08/25/2008	Ammonia Total as N	3.8		11.491	F	5		6	0
MOA01	SMI-PZ3S	08/25/2008	Sulfate	1000		1300		1080	F	6	0
MOA01	SMI-PZ3S	08/25/2008	Uranium	1.4		3.24	F	1.52	F	5	0
MOA01	TP-01	08/26/2008	Manganese	0.96		2	F	1.49		9	1
MOA01	TP-01	08/26/2008	Manganese	0.95		2	F	1.49		9	1
MOA01	TP-01	08/26/2008	Selenium	0.0019		0.0132	F	0.0051		9	1
MOA01	TP-01	08/26/2008	Total Dissolved Solids	7900		14800	F	13400	F	7	0
MOA01	TP-01	08/26/2008	Total Dissolved Solids	8000		14800	F	13400	F	7	0
MOA01	TP-01	08/26/2008	Uranium	0.19		0.41		0.213	F	12	0
MOA01	TP-02	08/27/2008	Ammonia Total as N	0.28		4		0.31		28	3
MOA01	TP-02	08/27/2008	Manganese	0.33		0.75		0.38		16	1

## Appendix B. Minimums and Maximums Reports (continued)

### AUGUST 2008 Wood Chip Area - Data Validation Minimums and Maximums Report - No Field Parameters

Laboratory: PARAGON (Fort Collins, CO)

RIN: 0808021

Comparison: All Historical Data

Report Date: 11/6/2008

Site Code	Location Code	Sample Date	Analyte	Current		Historical Maximum			Historical Minimum			Count	
				Result	Qualifiers <i>Lab Data</i>	Result	Qualifiers <i>Lab Data</i>		Result	Qualifiers <i>Lab Data</i>		N	N Below Detect
MOA01	TP-02	08/27/2008	Uranium	2.3		26			2.6			29	0

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

#### LAB QUALIFIERS:

- \* Replicate analysis not within control limits.
- > Result above upper detection limit.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and contract-required detection limit. Organic: Analyte also found in method blank.
- D Analyte determined in diluted sample.
- E Inorganic: Estimate value because of interference, see case narrative.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- J Estimated.
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: TIC.
- P > 25% difference in detected pesticide or Aroclor concentrations between two columns.
- U Analytical result below detection limit.
- W Postdigestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- X,Y,Z Laboratory defined qualifier, see case narrative.

#### DATA QUALIFIERS:

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

**Appendix C.**  
**Water Quality Data**

## Appendix C. Water Quality Data

**August 2008 Monthly General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 9/30/2008**

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
				Date	ID					Lab	Data	QA		
Ammonia Total as N	mg/L	0216	SL	08/12/2008	0001	0	-	0	0.1	U	J	#	0.1	
Ammonia Total as N	mg/L	0240	SL	08/13/2008	0001	0	-	0	0.1	U	J	#	0.1	
Ammonia Total as N	mg/L	0403	WL	08/05/2008	0001	18	-	18	28			#	2	
Ammonia Total as N	mg/L	0403	WL	08/05/2008	0002	18	-	18	28		J	#	1	
Ammonia Total as N	mg/L	0404	WL	08/05/2008	0001	18	-	18	290			#	10	
Ammonia Total as N	mg/L	0407	WL	08/06/2008	0001	17	-	17	9			#	2	
Ammonia Total as N	mg/L	0470	WL	08/04/2008	0001	10.3	-	19.7	280			#	10	
Ammonia Total as N	mg/L	0472	WL	08/04/2008	0001	10.3	-	19.7	370			#	10	
Ammonia Total as N	mg/L	0474	WL	08/04/2008	0001	10.3	-	19.7	340			#	10	
Ammonia Total as N	mg/L	0476	WL	08/04/2008	0001	10.3	-	19.7	270			#	10	
Ammonia Total as N	mg/L	0478	WL	08/04/2008	0001	9.6	-	23.9	250			#	10	
Ammonia Total as N	mg/L	0482	WL	08/05/2008	0001	55	-	55	360			#	50	
Ammonia Total as N	mg/L	0483	WL	08/05/2008	0001	18	-	18	180			#	10	
Ammonia Total as N	mg/L	0547	TS	08/06/2008	0001	0	-	0	360		J	#	10	
Ammonia Total as N	mg/L	0548	TS	08/06/2008	0001	0	-	0	290		J	#	10	
Ammonia Total as N	mg/L	0552	WL	08/06/2008	0001	18	-	18	650		J	#	50	
Ammonia Total as N	mg/L	0552	WL	08/06/2008	0002	18	-	18	590		J	#	50	
Ammonia Total as N	mg/L	0559	WL	08/05/2008	0001	18	-	18	10		J	#	1	
Ammonia Total as N	mg/L	0562	WL	08/12/2008	0001	1.3	-	2.3	18		J	#	1	
Ammonia Total as N	mg/L	0563	WL	08/12/2008	0001	4.6	-	5.6	41		J	#	10	
Ammonia Total as N	mg/L	0582	WL	08/05/2008	0001	18	-	18	46		J	#	10	
Ammonia Total as N	mg/L	0583	WL	08/05/2008	0001	18	-	18	110		J	#	10	
Ammonia Total as N	mg/L	0586	WL	08/05/2008	0001	18	-	18	13		J	#	1	
Ammonia Total as N	mg/L	0588	WL	08/05/2008	0001	34	-	34	440		J	#	10	
Ammonia Total as N	mg/L	0590	WL	08/13/2008	0001	1	-	2	68		J	#	10	

## Appendix C. Water Quality Data (continued)

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 9/30/2008**

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Lab	Data QA		
Ammonia Total as N	mg/L	0591	WL	08/13/2008	0001	3.9	-	4.9	130	J	#	10	
Ammonia Total as N	mg/L	0603	WL	08/13/2008	0001	9.2	-	10.2	370	J	#	10	
Ammonia Total as N	mg/L	0606	WL	08/12/2008	0001	9.3	-	10.3	56	J	#	10	
Ammonia Total as N	mg/L	0670	WL	08/04/2008	0001	15.9	-	45.9	430	J	#	10	
Ammonia Total as N	mg/L	0673	WL	08/04/2008	0001	16.3	-	46.3	470	J	#	20	
Ammonia Total as N	mg/L	0674	WL	08/04/2008	0001	15.1	-	45.1	490		#	10	
Ammonia Total as N	mg/L	0676	WL	08/04/2008	0001	15.9	-	45.9	420		#	10	
Ammonia Total as N	mg/L	0678	WL	08/04/2008	0001	16.3	-	46.3	300		#	10	
Ammonia Total as N	mg/L	0682	WL	08/05/2008	0001	28	-	28	420		#	10	
Ammonia Total as N	mg/L	0685	WL	08/05/2008	0001	18	-	18	230		#	10	
Ammonia Total as N	mg/L	0688	WL	08/05/2008	0001	31	-	31	940		#	50	
Ammonia Total as N	mg/L	0689	WL	08/05/2008	0001	46	-	46	500		#	50	
Ammonia Total as N	mg/L	0731	WL	08/06/2008	0001	18	-	18	4.3		#	0.2	
Ammonia Total as N	mg/L	0733	WL	08/06/2008	0001	18	-	18	33		#	10	
Ammonia Total as N	mg/L	0771	WL	08/04/2008	0001	15	-	34.9	87		#	10	
Ammonia Total as N	mg/L	0772	WL	08/04/2008	0001	15.15	-	35.05	190	J	#	10	
Ammonia Total as N	mg/L	0774	WL	08/04/2008	0001	15.5	-	35.4	330	J	#	10	
Ammonia Total as N	mg/L	0776	WL	08/04/2008	0001	15.15	-	35.05	300	J	#	10	
Ammonia Total as N	mg/L	0779	WL	08/04/2008	0001	15.66	-	35.56	750	J	#	50	
Ammonia Total as N	mg/L	0780	WL	08/11/2008	0001	28	-	28	480	J	#	10	
Ammonia Total as N	mg/L	0783	WL	08/11/2008	0001	18	-	18	85	J	#	10	
Ammonia Total as N	mg/L	0784	WL	08/11/2008	0001	18	-	18	5.1	J	#	0.2	
Ammonia Total as N	mg/L	0785	WL	08/11/2008	0001	18	-	18	13	J	#	0.5	

## Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 9/30/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range			Result	Lab	Qualifiers		Detection Limit	Uncertainty
				Date	ID	(Ft BLS)					Data	QA		
Bromide	mg/L	0216	SL	08/12/2008	0001	0	-	0	0.2	U	J	#	0.2	
Bromide	mg/L	0240	SL	08/13/2008	0001	0	-	0	0.2	U	J	#	0.2	
Bromide	mg/L	0403	WL	08/05/2008	0001	18	-	18	0.4	U		#	0.4	
Bromide	mg/L	0403	WL	08/05/2008	0002	18	-	18	0.4	U		#	0.4	
Bromide	mg/L	0404	WL	08/05/2008	0001	18	-	18	4	U		#	4	
Bromide	mg/L	0407	WL	08/06/2008	0001	17	-	17	0.2	U		#	0.2	
Bromide	mg/L	0470	WL	08/04/2008	0001	10.3	-	19.7	1	U		#	1	
Bromide	mg/L	0472	WL	08/04/2008	0001	10.3	-	19.7	2	U		#	2	
Bromide	mg/L	0474	WL	08/04/2008	0001	10.3	-	19.7	2	U		#	2	
Bromide	mg/L	0476	WL	08/04/2008	0001	10.3	-	19.7	2	U		#	2	
Bromide	mg/L	0478	WL	08/04/2008	0001	9.6	-	23.9	2	U		#	2	
Bromide	mg/L	0482	WL	08/05/2008	0001	55	-	55	20	U		#	20	
Bromide	mg/L	0483	WL	08/05/2008	0001	18	-	18	1	U		#	1	
Bromide	mg/L	0547	TS	08/06/2008	0001	0	-	0	4	U		#	4	
Bromide	mg/L	0548	TS	08/06/2008	0001	0	-	0	4	U		#	4	
Bromide	mg/L	0552	WL	08/06/2008	0001	18	-	18	4	U		#	4	
Bromide	mg/L	0552	WL	08/06/2008	0002	18	-	18	4	U		#	4	
Bromide	mg/L	0559	WL	08/05/2008	0001	18	-	18	0.2	U		#	0.2	
Bromide	mg/L	0562	WL	08/12/2008	0001	1.3	-	2.3	0.4	U	J	#	0.4	
Bromide	mg/L	0563	WL	08/12/2008	0001	4.6	-	5.6	0.2	U	J	#	0.2	
Bromide	mg/L	0582	WL	08/05/2008	0001	18	-	18	1	U		#	1	
Bromide	mg/L	0583	WL	08/05/2008	0001	18	-	18	1	U		#	1	
Bromide	mg/L	0586	WL	08/05/2008	0001	18	-	18	1	U		#	1	
Bromide	mg/L	0588	WL	08/05/2008	0001	34	-	34	4	U		#	4	
Bromide	mg/L	0590	WL	08/13/2008	0001	1	-	2	1	U	J	#	1	

## Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 9/30/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Lab	Qualifiers		Detection Limit	Uncertainty
				Date	ID						Data	QA		
Bromide	mg/L	0591	WL	08/13/2008	0001	3.9	-	4.9	1	U	J	#	1	
Bromide	mg/L	0603	WL	08/13/2008	0001	9.2	-	10.2	2	U	J	#	2	
Bromide	mg/L	0606	WL	08/12/2008	0001	9.3	-	10.3	0.2	U	J	#	0.2	
Bromide	mg/L	0670	WL	08/04/2008	0001	15.9	-	45.9	2	U		#	2	
Bromide	mg/L	0673	WL	08/04/2008	0001	16.3	-	46.3	4	U		#	4	
Bromide	mg/L	0674	WL	08/04/2008	0001	15.1	-	45.1	4	U		#	4	
Bromide	mg/L	0676	WL	08/04/2008	0001	15.9	-	45.9	4	U		#	4	
Bromide	mg/L	0678	WL	08/04/2008	0001	16.3	-	46.3	2	U		#	2	
Bromide	mg/L	0682	WL	08/05/2008	0001	28	-	28	4	U		#	4	
Bromide	mg/L	0685	WL	08/05/2008	0001	18	-	18	2	U		#	2	
Bromide	mg/L	0688	WL	08/05/2008	0001	31	-	31	4	U		#	4	
Bromide	mg/L	0689	WL	08/05/2008	0001	46	-	46	20	U		#	20	
Bromide	mg/L	0731	WL	08/06/2008	0001	18	-	18	1	U		#	1	
Bromide	mg/L	0733	WL	08/06/2008	0001	18	-	18	1	U		#	1	
Bromide	mg/L	0771	WL	08/04/2008	0001	15	-	34.9	1	U		#	1	
Bromide	mg/L	0772	WL	08/04/2008	0001	15.15	-	35.05	2	U		#	2	
Bromide	mg/L	0774	WL	08/04/2008	0001	15.5	-	35.4	4	U		#	4	
Bromide	mg/L	0776	WL	08/04/2008	0001	15.15	-	35.05	4	U		#	4	
Bromide	mg/L	0779	WL	08/04/2008	0001	15.66	-	35.56	10	U		#	10	
Bromide	mg/L	0780	WL	08/11/2008	0001	28	-	28	4	U	J	#	4	
Bromide	mg/L	0783	WL	08/11/2008	0001	18	-	18	1	U	J	#	1	
Bromide	mg/L	0784	WL	08/11/2008	0001	18	-	18	0.2	U	J	#	0.2	
Bromide	mg/L	0785	WL	08/11/2008	0001	18	-	18	0.2	U	J	#	0.2	
Chloride	mg/L	0216	SL	08/12/2008	0001	0	-	0	64		J	#	2	
Chloride	mg/L	0240	SL	08/13/2008	0001	0	-	0	75		J	#	2	

## Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 9/30/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID	Lab	Data	QA					
Chloride	mg/L	0403	WL	08/05/2008	0001	18	-	18	140		#	4	
Chloride	mg/L	0403	WL	08/05/2008	0002	18	-	18	120		#	4	
Chloride	mg/L	0404	WL	08/05/2008	0001	18	-	18	1800		#	40	
Chloride	mg/L	0407	WL	08/06/2008	0001	17	-	17	36		#	2	
Chloride	mg/L	0470	WL	08/04/2008	0001	10.3	-	19.7	860		#	10	
Chloride	mg/L	0472	WL	08/04/2008	0001	10.3	-	19.7	1800		#	20	
Chloride	mg/L	0474	WL	08/04/2008	0001	10.3	-	19.7	2000		#	20	
Chloride	mg/L	0476	WL	08/04/2008	0001	10.3	-	19.7	1300		#	20	
Chloride	mg/L	0478	WL	08/04/2008	0001	9.6	-	23.9	2000		#	20	
Chloride	mg/L	0482	WL	08/05/2008	0001	55	-	55	51000		#	1000	
Chloride	mg/L	0483	WL	08/05/2008	0001	18	-	18	1200		#	20	
Chloride	mg/L	0547	TS	08/06/2008	0001	0	-	0	4500		#	100	
Chloride	mg/L	0548	TS	08/06/2008	0001	0	-	0	3700		#	40	
Chloride	mg/L	0552	WL	08/06/2008	0001	18	-	18	3700		#	40	
Chloride	mg/L	0552	WL	08/06/2008	0002	18	-	18	3600		#	40	
Chloride	mg/L	0559	WL	08/05/2008	0001	18	-	18	100		#	4	
Chloride	mg/L	0562	WL	08/12/2008	0001	1.3	-	2.3	150	J	#	4	
Chloride	mg/L	0563	WL	08/12/2008	0001	4.6	-	5.6	95	J	#	4	
Chloride	mg/L	0582	WL	08/05/2008	0001	18	-	18	1300		#	20	
Chloride	mg/L	0583	WL	08/05/2008	0001	18	-	18	600		#	10	
Chloride	mg/L	0586	WL	08/05/2008	0001	18	-	18	410		#	10	
Chloride	mg/L	0588	WL	08/05/2008	0001	34	-	34	4500		#	100	
Chloride	mg/L	0590	WL	08/13/2008	0001	1	-	2	1100	J	#	20	
Chloride	mg/L	0591	WL	08/13/2008	0001	3.9	-	4.9	260	J	#	10	
Chloride	mg/L	0603	WL	08/13/2008	0001	9.2	-	10.2	1100	J	#	20	

## Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 9/30/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID	Lab	Data	QA					
Chloride	mg/L	0606	WL	08/12/2008	0001	9.3	-	10.3	110	J	#	4	
Chloride	mg/L	0670	WL	08/04/2008	0001	15.9	-	45.9	2500		#	40	
Chloride	mg/L	0673	WL	08/04/2008	0001	16.3	-	46.3	8300		#	100	
Chloride	mg/L	0674	WL	08/04/2008	0001	15.1	-	45.1	7200		#	100	
Chloride	mg/L	0676	WL	08/04/2008	0001	15.9	-	45.9	3200		#	40	
Chloride	mg/L	0678	WL	08/04/2008	0001	16.3	-	46.3	2600		#	40	
Chloride	mg/L	0682	WL	08/05/2008	0001	28	-	28	2000		#	40	
Chloride	mg/L	0685	WL	08/05/2008	0001	18	-	18	780		#	20	
Chloride	mg/L	0688	WL	08/05/2008	0001	31	-	31	7300		#	100	
Chloride	mg/L	0689	WL	08/05/2008	0001	46	-	46	42000		#	1000	
Chloride	mg/L	0731	WL	08/06/2008	0001	18	-	18	430		#	10	
Chloride	mg/L	0733	WL	08/06/2008	0001	18	-	18	290		#	10	
Chloride	mg/L	0771	WL	08/04/2008	0001	15	-	34.9	1300		#	20	
Chloride	mg/L	0772	WL	08/04/2008	0001	15.15	-	35.05	3900		#	40	
Chloride	mg/L	0774	WL	08/04/2008	0001	15.5	-	35.4	3600		#	40	
Chloride	mg/L	0776	WL	08/04/2008	0001	15.15	-	35.05	4600		#	100	
Chloride	mg/L	0779	WL	08/04/2008	0001	15.66	-	35.56	13000		#	200	
Chloride	mg/L	0780	WL	08/11/2008	0001	28	-	28	3400	J	#	40	
Chloride	mg/L	0783	WL	08/11/2008	0001	18	-	18	850	J	#	20	
Chloride	mg/L	0784	WL	08/11/2008	0001	18	-	18	100	J	#	2	
Chloride	mg/L	0785	WL	08/11/2008	0001	18	-	18	91	J	#	4	
Copper	mg/L	0785	WL	08/11/2008	0001	18	-	18	0.0013	U	#	0.0013	
Dissolved Oxygen	mg/L	0216	SL	08/12/2008	0001	0	-	0	7.62		#		
Dissolved Oxygen	mg/L	0240	SL	08/13/2008	0001	0	-	0	6.08		#		
Dissolved Oxygen	mg/L	0403	WL	08/05/2008	0001	18	-	18	0.17		#		

## Appendix C. Water Quality Data (continued)

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 9/30/2008**

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Lab	Data QA		
Dissolved Oxygen	mg/L	0404	WL	08/05/2008	0001	18	-	18	0.23		#		
Dissolved Oxygen	mg/L	0407	WL	08/06/2008	0001	17	-	17	0.5		#		
Dissolved Oxygen	mg/L	0470	WL	08/04/2008	0001	10.3	-	19.7	2.25		#		
Dissolved Oxygen	mg/L	0472	WL	08/04/2008	0001	10.3	-	19.7	2.74		#		
Dissolved Oxygen	mg/L	0474	WL	08/04/2008	0001	10.3	-	19.7	3.38		#		
Dissolved Oxygen	mg/L	0476	WL	08/04/2008	0001	10.3	-	19.7	3.22		#		
Dissolved Oxygen	mg/L	0478	WL	08/04/2008	0001	9.6	-	23.9	4.56		#		
Dissolved Oxygen	mg/L	0482	WL	08/05/2008	0001	55	-	55	0.03		#		
Dissolved Oxygen	mg/L	0483	WL	08/05/2008	0001	18	-	18	0.18		#		
Dissolved Oxygen	mg/L	0547	TS	08/06/2008	0001	0	-	0	1.89		#		
Dissolved Oxygen	mg/L	0548	TS	08/06/2008	0001	0	-	0	2		#		
Dissolved Oxygen	mg/L	0552	WL	08/06/2008	0001	18	-	18	0.17		#		
Dissolved Oxygen	mg/L	0559	WL	08/05/2008	0001	18	-	18	0.2		#		
Dissolved Oxygen	mg/L	0562	WL	08/12/2008	0001	1.3	-	2.3	2.51		#		
Dissolved Oxygen	mg/L	0563	WL	08/12/2008	0001	4.6	-	5.6	1.42		#		
Dissolved Oxygen	mg/L	0582	WL	08/05/2008	0001	18	-	18	0.13		#		
Dissolved Oxygen	mg/L	0583	WL	08/05/2008	0001	18	-	18	0.18		#		
Dissolved Oxygen	mg/L	0586	WL	08/05/2008	0001	18	-	18	0.54		#		
Dissolved Oxygen	mg/L	0588	WL	08/05/2008	0001	34	-	34	0.12		#		
Dissolved Oxygen	mg/L	0590	WL	08/13/2008	0001	1	-	2	3.77		#		
Dissolved Oxygen	mg/L	0591	WL	08/13/2008	0001	3.9	-	4.9	5.45		#		
Dissolved Oxygen	mg/L	0603	WL	08/13/2008	0001	9.2	-	10.2	0.74		#		
Dissolved Oxygen	mg/L	0606	WL	08/12/2008	0001	9.3	-	10.3	1.32		#		
Dissolved Oxygen	mg/L	0670	WL	08/04/2008	0001	15.9	-	45.9	3.05		#		
Dissolved Oxygen	mg/L	0673	WL	08/04/2008	0001	16.3	-	46.3	2.39		#		

## Appendix C. Water Quality Data (continued)

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 9/30/2008**

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)		Result	Qualifiers			Detection Limit	Uncertainty
				Date	ID	Lab	Data		QA				
Dissolved Oxygen	mg/L	0674	WL	08/04/2008	0001	15.1	- 45.1	2.11			#		
Dissolved Oxygen	mg/L	0676	WL	08/04/2008	0001	15.9	- 45.9	4.68			#		
Dissolved Oxygen	mg/L	0678	WL	08/04/2008	0001	16.3	- 46.3	3.22			#		
Dissolved Oxygen	mg/L	0682	WL	08/05/2008	0001	28	- 28	0.38			#		
Dissolved Oxygen	mg/L	0685	WL	08/05/2008	0001	18	- 18	0.25			#		
Dissolved Oxygen	mg/L	0688	WL	08/05/2008	0001	0	- 31	0.23			#		
Dissolved Oxygen	mg/L	0689	WL	08/05/2008	0001	0	- 46	0.15			#		
Dissolved Oxygen	mg/L	0731	WL	08/06/2008	0001	18	- 18	0.14			#		
Dissolved Oxygen	mg/L	0733	WL	08/06/2008	0001	18	- 18	0.07			#		
Dissolved Oxygen	mg/L	0771	WL	08/04/2008	0001	15	- 34.9	0.79			#		
Dissolved Oxygen	mg/L	0772	WL	08/04/2008	0001	15.15	- 35.05	2.32			#		
Dissolved Oxygen	mg/L	0774	WL	08/04/2008	0001	15.5	- 35.4	3.08			#		
Dissolved Oxygen	mg/L	0776	WL	08/04/2008	0001	15.15	- 35.05	2.26			#		
Dissolved Oxygen	mg/L	0779	WL	08/04/2008	0001	15.66	- 35.56	2.98			#		
Dissolved Oxygen	mg/L	0780	WL	08/11/2008	0001	28	- 28	0.84			#		
Dissolved Oxygen	mg/L	0783	WL	08/11/2008	0001	18	- 18	0.31			#		
Dissolved Oxygen	mg/L	0784	WL	08/11/2008	0001	18	- 18	0.17			#		
Dissolved Oxygen	mg/L	0785	WL	08/11/2008	0001	18	- 18	0.19			#		
Manganese	mg/L	0216	SL	08/12/2008	0001	0	- 0	0.0025	B	J	#	0.0002	
Manganese	mg/L	0240	SL	08/13/2008	0001	0	- 0	0.57		J	#	0.0002	
Manganese	mg/L	0403	WL	08/05/2008	0001	18	- 18	0.86			#	0.0002	
Manganese	mg/L	0403	WL	08/05/2008	0002	18	- 18	0.85			#	0.0002	
Manganese	mg/L	0404	WL	08/05/2008	0001	18	- 18	5			#	0.002	
Manganese	mg/L	0407	WL	08/06/2008	0001	17	- 17	0.22			#	0.0002	
Manganese	mg/L	0470	WL	08/04/2008	0001	10.3	- 19.7	1.1			#	0.001	

## Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 9/30/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Lab	Data QA		
Manganese	mg/L	0472	WL	08/04/2008	0001	10.3	-	19.7	2.5		#	0.001	
Manganese	mg/L	0474	WL	08/04/2008	0001	10.3	-	19.7	2.9		#	0.002	
Manganese	mg/L	0476	WL	08/04/2008	0001	10.3	-	19.7	2.9		#	0.001	
Manganese	mg/L	0478	WL	08/04/2008	0001	9.6	-	23.9	3.3		#	0.002	
Manganese	mg/L	0482	WL	08/05/2008	0001	55	-	55	11		#	0.01	
Manganese	mg/L	0483	WL	08/05/2008	0001	18	-	18	0.74		#	0.001	
Manganese	mg/L	0547	TS	08/06/2008	0001	0	-	0	3.5		#	0.002	
Manganese	mg/L	0548	TS	08/06/2008	0001	0	-	0	2		#	0.002	
Manganese	mg/L	0552	WL	08/06/2008	0001	18	-	18	5.6		#	0.002	
Manganese	mg/L	0552	WL	08/06/2008	0002	18	-	18	6.1		#	0.002	
Manganese	mg/L	0559	WL	08/05/2008	0001	18	-	18	1.1		#	0.0002	
Manganese	mg/L	0562	WL	08/12/2008	0001	1.3	-	2.3	1.4		#	0.0002	
Manganese	mg/L	0563	WL	08/12/2008	0001	4.6	-	5.6	0.24		#	0.0002	
Manganese	mg/L	0582	WL	08/05/2008	0001	18	-	18	2.7		#	0.001	
Manganese	mg/L	0583	WL	08/05/2008	0001	18	-	18	1.8		#	0.001	
Manganese	mg/L	0586	WL	08/05/2008	0001	18	-	18	1.3		#	0.00041	
Manganese	mg/L	0588	WL	08/05/2008	0001	34	-	34	4		#	0.002	
Manganese	mg/L	0590	WL	08/13/2008	0001	1	-	2	4.6		#	0.001	
Manganese	mg/L	0591	WL	08/13/2008	0001	3.9	-	4.9	0.49		#	0.00041	
Manganese	mg/L	0603	WL	08/13/2008	0001	9.2	-	10.2	1.5		#	0.001	
Manganese	mg/L	0606	WL	08/12/2008	0001	9.3	-	10.3	0.038		#	0.0002	
Manganese	mg/L	0670	WL	08/04/2008	0001	15.9	-	45.9	4.9		#	0.002	
Manganese	mg/L	0673	WL	08/04/2008	0001	16.3	-	46.3	4.6		#	0.002	
Manganese	mg/L	0674	WL	08/04/2008	0001	15.1	-	45.1	4.3		#	0.002	
Manganese	mg/L	0676	WL	08/04/2008	0001	15.9	-	45.9	4.4		#	0.002	

## Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 9/30/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Lab	Data QA		
Manganese	mg/L	0678	WL	08/04/2008	0001	16.3	-	46.3	3.4		#	0.002	
Manganese	mg/L	0682	WL	08/05/2008	0001	28	-	28	5.4		#	0.002	
Manganese	mg/L	0685	WL	08/05/2008	0001	18	-	18	2.9		#	0.001	
Manganese	mg/L	0688	WL	08/05/2008	0001	31	-	31	5		#	0.0051	
Manganese	mg/L	0689	WL	08/05/2008	0001	46	-	46	7.3		#	0.01	
Manganese	mg/L	0731	WL	08/06/2008	0001	18	-	18	1		#	0.00041	
Manganese	mg/L	0733	WL	08/06/2008	0001	18	-	18	1.8		#	0.00041	
Manganese	mg/L	0771	WL	08/04/2008	0001	15	-	34.9	1		#	0.001	
Manganese	mg/L	0772	WL	08/04/2008	0001	15.15	-	35.05	1.9		#	0.002	
Manganese	mg/L	0774	WL	08/04/2008	0001	15.5	-	35.4	3.7		#	0.002	
Manganese	mg/L	0776	WL	08/04/2008	0001	15.15	-	35.05	2.2		#	0.002	
Manganese	mg/L	0779	WL	08/04/2008	0001	15.66	-	35.56	4.4		#	0.0051	
Manganese	mg/L	0780	WL	08/11/2008	0001	28	-	28	3.6		#	0.002	
Manganese	mg/L	0783	WL	08/11/2008	0001	18	-	18	1.6		#	0.001	
Manganese	mg/L	0784	WL	08/11/2008	0001	18	-	18	0.76		#	0.0002	
Manganese	mg/L	0785	WL	08/11/2008	0001	18	-	18	1.1		#	0.0002	
Oxidation Reduction Potential	mV	0216	SL	08/12/2008	0001	0	-	0	-78		#		
Oxidation Reduction Potential	mV	0240	SL	08/13/2008	0001	0	-	0	68		#		
Oxidation Reduction Potential	mV	0403	WL	08/05/2008	0001	18	-	18	-70		#		
Oxidation Reduction Potential	mV	0404	WL	08/05/2008	0001	18	-	18	106		#		
Oxidation Reduction Potential	mV	0407	WL	08/06/2008	0001	17	-	17	-56		#		
Oxidation Reduction Potential	mV	0470	WL	08/04/2008	0001	10.3	-	19.7	53		#		
Oxidation Reduction Potential	mV	0472	WL	08/04/2008	0001	10.3	-	19.7	70		#		

## Appendix C. Water Quality Data (continued)

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 9/30/2008**

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Lab	Data QA		
Oxidation Reduction Potential	mV	0474	WL	08/04/2008	0001	10.3	-	19.7	74		#		
Oxidation Reduction Potential	mV	0476	WL	08/04/2008	0001	10.3	-	19.7	71		#		
Oxidation Reduction Potential	mV	0478	WL	08/04/2008	0001	9.6	-	23.9	74		#		
Oxidation Reduction Potential	mV	0482	WL	08/05/2008	0001	55	-	55	-3.6		#		
Oxidation Reduction Potential	mV	0483	WL	08/05/2008	0001	18	-	18	-38.4		#		
Oxidation Reduction Potential	mV	0547	TS	08/06/2008	0001	0	-	0	178.8		#		
Oxidation Reduction Potential	mV	0548	TS	08/06/2008	0001	0	-	0	141.6		#		
Oxidation Reduction Potential	mV	0552	WL	08/06/2008	0001	18	-	18	110.1		#		
Oxidation Reduction Potential	mV	0559	WL	08/05/2008	0001	18	-	18	-53.3		#		
Oxidation Reduction Potential	mV	0562	WL	08/12/2008	0001	1.3	-	2.3	-103		#		
Oxidation Reduction Potential	mV	0563	WL	08/12/2008	0001	4.6	-	5.6	-89		#		
Oxidation Reduction Potential	mV	0582	WL	08/05/2008	0001	18	-	18	-56.4		#		
Oxidation Reduction Potential	mV	0583	WL	08/05/2008	0001	18	-	18	-61.9		#		
Oxidation Reduction Potential	mV	0586	WL	08/05/2008	0001	18	-	18	-95.6		#		
Oxidation Reduction Potential	mV	0588	WL	08/05/2008	0001	34	-	34	-62.2		#		
Oxidation Reduction Potential	mV	0590	WL	08/13/2008	0001	1	-	2	-64		#		
Oxidation Reduction Potential	mV	0591	WL	08/13/2008	0001	3.9	-	4.9	20		#		
Oxidation Reduction Potential	mV	0603	WL	08/13/2008	0001	9.2	-	10.2	-132		#		
Oxidation Reduction Potential	mV	0606	WL	08/12/2008	0001	9.3	-	10.3	-115		#		
Oxidation Reduction Potential	mV	0670	WL	08/04/2008	0001	15.9	-	45.9	103		#		

## Appendix C. Water Quality Data (continued)

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 9/30/2008**

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
				Date	ID					Lab	Data	QA		
Oxidation Reduction Potential	mV	0673	WL	08/04/2008	0001	16.3	-	46.3	104			#		
Oxidation Reduction Potential	mV	0674	WL	08/04/2008	0001	15.1	-	45.1	120			#		
Oxidation Reduction Potential	mV	0676	WL	08/04/2008	0001	15.9	-	45.9	46			#		
Oxidation Reduction Potential	mV	0678	WL	08/04/2008	0001	16.3	-	46.3	120			#		
Oxidation Reduction Potential	mV	0682	WL	08/05/2008	0001	28	-	28	61.3			#		
Oxidation Reduction Potential	mV	0685	WL	08/05/2008	0001	18	-	18	71.7			#		
Oxidation Reduction Potential	mV	0688	WL	08/05/2008	0001	0	-	31	144.9			#		
Oxidation Reduction Potential	mV	0689	WL	08/05/2008	0001	0	-	46	181.8			#		
Oxidation Reduction Potential	mV	0731	WL	08/06/2008	0001	18	-	18	-7.3			#		
Oxidation Reduction Potential	mV	0733	WL	08/06/2008	0001	18	-	18	-0.7			#		
Oxidation Reduction Potential	mV	0771	WL	08/04/2008	0001	15	-	34.9	129			#		
Oxidation Reduction Potential	mV	0772	WL	08/04/2008	0001	15.15	-	35.05	134			#		
Oxidation Reduction Potential	mV	0774	WL	08/04/2008	0001	15.5	-	35.4	137			#		
Oxidation Reduction Potential	mV	0776	WL	08/04/2008	0001	15.15	-	35.05	135			#		
Oxidation Reduction Potential	mV	0779	WL	08/04/2008	0001	15.66	-	35.56	145			#		
Oxidation Reduction Potential	mV	0780	WL	08/11/2008	0001	28	-	28	-50.9			#		
Oxidation Reduction Potential	mV	0783	WL	08/11/2008	0001	18	-	18	-101.5			#		
Oxidation Reduction Potential	mV	0784	WL	08/11/2008	0001	18	-	18	-65.1			#		
Oxidation Reduction Potential	mV	0785	WL	08/11/2008	0001	18	-	18	-109.2			#		
pH	s.u.	0216	SL	08/12/2008	0001	0	-	0	8.11			#		
pH	s.u.	0240	SL	08/13/2008	0001	0	-	0	6.24			#		

## Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 9/30/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Lab	Data QA		
pH	s.u.	0403	WL	08/05/2008	0001	18	-	18	7.1		#		
pH	s.u.	0404	WL	08/05/2008	0001	18	-	18	6.71		#		
pH	s.u.	0407	WL	08/06/2008	0001	17	-	17	7.71		#		
pH	s.u.	0470	WL	08/04/2008	0001	10.3	-	19.7	7.71		#		
pH	s.u.	0472	WL	08/04/2008	0001	10.3	-	19.7	7.24		#		
pH	s.u.	0474	WL	08/04/2008	0001	10.3	-	19.7	7.01		#		
pH	s.u.	0476	WL	08/04/2008	0001	10.3	-	19.7	7.14		#		
pH	s.u.	0478	WL	08/04/2008	0001	9.6	-	23.9	7.15		#		
pH	s.u.	0482	WL	08/05/2008	0001	55	-	55	6.82		#		
pH	s.u.	0483	WL	08/05/2008	0001	18	-	18	7.81		#		
pH	s.u.	0547	TS	08/06/2008	0001	0	-	0	6.55		#		
pH	s.u.	0548	TS	08/06/2008	0001	0	-	0	7.8		#		
pH	s.u.	0552	WL	08/06/2008	0001	18	-	18	6.89		#		
pH	s.u.	0559	WL	08/05/2008	0001	18	-	18	7.18		#		
pH	s.u.	0562	WL	08/12/2008	0001	1.3	-	2.3	7.21		#		
pH	s.u.	0563	WL	08/12/2008	0001	4.6	-	5.6	8.01		#		
pH	s.u.	0582	WL	08/05/2008	0001	18	-	18	7.12		#		
pH	s.u.	0583	WL	08/05/2008	0001	18	-	18	7.21		#		
pH	s.u.	0586	WL	08/05/2008	0001	18	-	18	7.11		#		
pH	s.u.	0588	WL	08/05/2008	0001	34	-	34	7.03		#		
pH	s.u.	0590	WL	08/13/2008	0001	1	-	2	7.45		#		
pH	s.u.	0591	WL	08/13/2008	0001	3.9	-	4.9	7.93		#		
pH	s.u.	0603	WL	08/13/2008	0001	9.2	-	10.2	7.51		#		
pH	s.u.	0606	WL	08/12/2008	0001	9.3	-	10.3	8.59		#		
pH	s.u.	0670	WL	08/04/2008	0001	15.9	-	45.9	6.69		#		

## Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 9/30/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range		Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID	(Ft BLS)	Lab		Data	QA		
pH	s.u.	0673	WL	08/04/2008	0001	16.3	- 46.3	6.96			#	
pH	s.u.	0674	WL	08/04/2008	0001	15.1	- 45.1	7			#	
pH	s.u.	0676	WL	08/04/2008	0001	15.9	- 45.9	7.47			#	
pH	s.u.	0678	WL	08/04/2008	0001	16.3	- 46.3	7.2			#	
pH	s.u.	0682	WL	08/05/2008	0001	28	- 28	6.82			#	
pH	s.u.	0685	WL	08/05/2008	0001	18	- 18	7.03			#	
pH	s.u.	0688	WL	08/05/2008	0001	0	- 31	6.72			#	
pH	s.u.	0689	WL	08/05/2008	0001	0	- 46	6.58			#	
pH	s.u.	0731	WL	08/06/2008	0001	18	- 18	7.28			#	
pH	s.u.	0733	WL	08/06/2008	0001	18	- 18	7.18			#	
pH	s.u.	0771	WL	08/04/2008	0001	15	- 34.9	6.95			#	
pH	s.u.	0772	WL	08/04/2008	0001	15.15	- 35.05	7.26			#	
pH	s.u.	0774	WL	08/04/2008	0001	15.5	- 35.4	7.04			#	
pH	s.u.	0776	WL	08/04/2008	0001	15.15	- 35.05	7.43			#	
pH	s.u.	0779	WL	08/04/2008	0001	15.66	- 35.56	7.17			#	
pH	s.u.	0780	WL	08/11/2008	0001	28	- 28	6.93			#	
pH	s.u.	0783	WL	08/11/2008	0001	18	- 18	7.09			#	
pH	s.u.	0784	WL	08/11/2008	0001	18	- 18	7.3			#	
pH	s.u.	0785	WL	08/11/2008	0001	18	- 18	7.24			#	
Selenium	mg/L	0606	WL	08/12/2008	0001	9.3	- 10.3	0.0096		J	#	0.00012
Selenium	mg/L	0676	WL	08/04/2008	0001	15.9	- 45.9	0.012	E		#	0.00012
Specific Conductance	µmhos/cm	0216	SL	08/12/2008	0001	0	- 0	996			#	
Specific Conductance	µmhos/cm	0240	SL	08/13/2008	0001	0	- 0	1128			#	
Specific Conductance	µmhos/cm	0403	WL	08/05/2008	0001	18	- 18	1781			#	

## Appendix C. Water Quality Data (continued)

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 9/30/2008**

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
				Date	ID					Lab	Data	QA		
Specific Conductance	µmhos /cm	0404	WL	08/05/2008	0001	18	-	18	18684			#		
Specific Conductance	µmhos /cm	0407	WL	08/06/2008	0001	17	-	17	814			#		
Specific Conductance	µmhos /cm	0470	WL	08/04/2008	0001	10.3	-	19.7	8511			#		
Specific Conductance	µmhos /cm	0472	WL	08/04/2008	0001	10.3	-	19.7	13495			#		
Specific Conductance	µmhos /cm	0474	WL	08/04/2008	0001	10.3	-	19.7	14588			#		
Specific Conductance	µmhos /cm	0476	WL	08/04/2008	0001	10.3	-	19.7	12488			#		
Specific Conductance	µmhos /cm	0478	WL	08/04/2008	0001	9.6	-	23.9	15862			#		
Specific Conductance	µmhos /cm	0482	WL	08/05/2008	0001	55	-	55	113986			#		
Specific Conductance	µmhos /cm	0483	WL	08/05/2008	0001	18	-	18	7370			#		
Specific Conductance	µmhos /cm	0547	TS	08/06/2008	0001	0	-	0	20916			#		
Specific Conductance	µmhos /cm	0548	TS	08/06/2008	0001	0	-	0	19257			#		
Specific Conductance	µmhos /cm	0552	WL	08/06/2008	0001	18	-	18	22885			#		
Specific Conductance	µmhos /cm	0559	WL	08/05/2008	0001	18	-	18	1507			#		
Specific Conductance	µmhos /cm	0562	WL	08/12/2008	0001	1.3	-	2.3	1927			#		
Specific Conductance	µmhos /cm	0563	WL	08/12/2008	0001	4.6	-	5.6	1439			#		
Specific Conductance	µmhos /cm	0582	WL	08/05/2008	0001	18	-	18	8448			#		
Specific Conductance	µmhos /cm	0583	WL	08/05/2008	0001	18	-	18	6504			#		
Specific Conductance	µmhos /cm	0586	WL	08/05/2008	0001	18	-	18	5420			#		
Specific Conductance	µmhos /cm	0588	WL	08/05/2008	0001	34	-	34	22618			#		
Specific Conductance	µmhos /cm	0590	WL	08/13/2008	0001	1	-	2	8719			#		

## Appendix C. Water Quality Data (continued)

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 9/30/2008**

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Lab	Data QA		
Specific Conductance	µmhos /cm	0591	WL	08/13/2008	0001	3.9	-	4.9	3514		#		
Specific Conductance	µmhos /cm	0603	WL	08/13/2008	0001	9.2	-	10.2	9400		#		
Specific Conductance	µmhos /cm	0606	WL	08/12/2008	0001	9.3	-	10.3	1666		#		
Specific Conductance	µmhos /cm	0670	WL	08/04/2008	0001	15.9	-	45.9	17493		#		
Specific Conductance	µmhos /cm	0673	WL	08/04/2008	0001	16.3	-	46.3	31760		#		
Specific Conductance	µmhos /cm	0674	WL	08/04/2008	0001	15.1	-	45.1	30318		#		
Specific Conductance	µmhos /cm	0676	WL	08/04/2008	0001	15.9	-	45.9	20826		#		
Specific Conductance	µmhos /cm	0678	WL	08/04/2008	0001	16.3	-	46.3	16473		#		
Specific Conductance	µmhos /cm	0682	WL	08/05/2008	0001	28	-	28	19158		#		
Specific Conductance	µmhos /cm	0685	WL	08/05/2008	0001	18	-	18	10500		#		
Specific Conductance	µmhos /cm	0688	WL	08/05/2008	0001	0	-	31	36888		#		
Specific Conductance	µmhos /cm	0689	WL	08/05/2008	0001	0	-	46	98124		#		
Specific Conductance	µmhos /cm	0731	WL	08/06/2008	0001	18	-	18	5227		#		
Specific Conductance	µmhos /cm	0733	WL	08/06/2008	0001	18	-	18	5326		#		
Specific Conductance	µmhos /cm	0771	WL	08/04/2008	0001	15	-	34.9	8426		#		
Specific Conductance	µmhos /cm	0772	WL	08/04/2008	0001	15.15	-	35.05	15184		#		
Specific Conductance	µmhos /cm	0774	WL	08/04/2008	0001	15.5	-	35.4	16984		#		
Specific Conductance	µmhos /cm	0776	WL	08/04/2008	0001	15.15	-	35.05	17757		#		
Specific Conductance	µmhos /cm	0779	WL	08/04/2008	0001	15.66	-	35.56	39574		#		
Specific Conductance	µmhos /cm	0780	WL	08/11/2008	0001	28	-	28	20492		#		

## Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 9/30/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Lab	Data QA		
Specific Conductance	µmhos/cm	0783	WL	08/11/2008	0001	18	-	18	8614		#		
Specific Conductance	µmhos/cm	0784	WL	08/11/2008	0001	18	-	18	1421		#		
Specific Conductance	µmhos/cm	0785	WL	08/11/2008	0001	18	-	18	1694		#		
Sulfate	mg/L	0216	SL	08/12/2008	0001	0	-	0	230	J	#	5	
Sulfate	mg/L	0240	SL	08/13/2008	0001	0	-	0	290	J	#	5	
Sulfate	mg/L	0403	WL	08/05/2008	0001	18	-	18	530		#	10	
Sulfate	mg/L	0403	WL	08/05/2008	0002	18	-	18	470		#	10	
Sulfate	mg/L	0404	WL	08/05/2008	0001	18	-	18	8600		#	100	
Sulfate	mg/L	0407	WL	08/06/2008	0001	17	-	17	120		#	5	
Sulfate	mg/L	0470	WL	08/04/2008	0001	10.3	-	19.7	2400		#	25	
Sulfate	mg/L	0472	WL	08/04/2008	0001	10.3	-	19.7	5000		#	50	
Sulfate	mg/L	0474	WL	08/04/2008	0001	10.3	-	19.7	5800		#	50	
Sulfate	mg/L	0476	WL	08/04/2008	0001	10.3	-	19.7	5500		#	50	
Sulfate	mg/L	0478	WL	08/04/2008	0001	9.6	-	23.9	6600		#	50	
Sulfate	mg/L	0482	WL	08/05/2008	0001	55	-	55	8400		#	50	
Sulfate	mg/L	0483	WL	08/05/2008	0001	18	-	18	2000		#	25	
Sulfate	mg/L	0547	TS	08/06/2008	0001	0	-	0	6100		#	100	
Sulfate	mg/L	0548	TS	08/06/2008	0001	0	-	0	6200		#	100	
Sulfate	mg/L	0552	WL	08/06/2008	0001	18	-	18	9500		#	100	
Sulfate	mg/L	0552	WL	08/06/2008	0002	18	-	18	9500		#	100	
Sulfate	mg/L	0559	WL	08/05/2008	0001	18	-	18	310		#	10	
Sulfate	mg/L	0562	WL	08/12/2008	0001	1.3	-	2.3	490	J	#	10	
Sulfate	mg/L	0563	WL	08/12/2008	0001	4.6	-	5.6	270	J	#	10	
Sulfate	mg/L	0582	WL	08/05/2008	0001	18	-	18	3500		#	50	

## Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 9/30/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID	Lab	Data	QA					
Sulfate	mg/L	0583	WL	08/05/2008	0001	18	-	18	2500		#	25	
Sulfate	mg/L	0586	WL	08/05/2008	0001	18	-	18	2200		#	25	
Sulfate	mg/L	0588	WL	08/05/2008	0001	34	-	34	8000		#	250	
Sulfate	mg/L	0590	WL	08/13/2008	0001	1	-	2	2800	J	#	50	
Sulfate	mg/L	0591	WL	08/13/2008	0001	3.9	-	4.9	1100	J	#	25	
Sulfate	mg/L	0603	WL	08/13/2008	0001	9.2	-	10.2	3700	J	#	50	
Sulfate	mg/L	0606	WL	08/12/2008	0001	9.3	-	10.3	290	J	#	10	
Sulfate	mg/L	0670	WL	08/04/2008	0001	15.9	-	45.9	8300		#	100	
Sulfate	mg/L	0673	WL	08/04/2008	0001	16.3	-	46.3	8700		#	250	
Sulfate	mg/L	0674	WL	08/04/2008	0001	15.1	-	45.1	8700		#	250	
Sulfate	mg/L	0676	WL	08/04/2008	0001	15.9	-	45.9	7900		#	100	
Sulfate	mg/L	0678	WL	08/04/2008	0001	16.3	-	46.3	6200		#	100	
Sulfate	mg/L	0682	WL	08/05/2008	0001	28	-	28	9500		#	100	
Sulfate	mg/L	0685	WL	08/05/2008	0001	18	-	18	4800		#	50	
Sulfate	mg/L	0688	WL	08/05/2008	0001	31	-	31	14000		#	250	
Sulfate	mg/L	0689	WL	08/05/2008	0001	46	-	46	9300		#	50	
Sulfate	mg/L	0731	WL	08/06/2008	0001	18	-	18	2100		#	25	
Sulfate	mg/L	0733	WL	08/06/2008	0001	18	-	18	2000		#	25	
Sulfate	mg/L	0771	WL	08/04/2008	0001	15	-	34.9	2300		#	50	
Sulfate	mg/L	0772	WL	08/04/2008	0001	15.15	-	35.05	3400		#	100	
Sulfate	mg/L	0774	WL	08/04/2008	0001	15.5	-	35.4	6600		#	100	
Sulfate	mg/L	0776	WL	08/04/2008	0001	15.15	-	35.05	3500		#	250	
Sulfate	mg/L	0779	WL	08/04/2008	0001	15.66	-	35.56	6700		#	500	
Sulfate	mg/L	0780	WL	08/11/2008	0001	28	-	28	6500	J	#	100	
Sulfate	mg/L	0783	WL	08/11/2008	0001	18	-	18	3000	J	#	50	

## Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 9/30/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
				Date	ID					Lab	Data	QA		
Sulfate	mg/L	0784	WL	08/11/2008	0001	18	-	18	310	J	#	5		
Sulfate	mg/L	0785	WL	08/11/2008	0001	18	-	18	510	J	#	10		
Temperature	C	0216	SL	08/12/2008	0001	0	-	0	24.11		#			
Temperature	C	0240	SL	08/13/2008	0001	0	-	0	18.64		#			
Temperature	C	0403	WL	08/05/2008	0001	18	-	18	17.01		#			
Temperature	C	0404	WL	08/05/2008	0001	18	-	18	16.26		#			
Temperature	C	0407	WL	08/06/2008	0001	17	-	17	14.82		#			
Temperature	C	0470	WL	08/04/2008	0001	10.3	-	19.7	17.49		#			
Temperature	C	0472	WL	08/04/2008	0001	10.3	-	19.7	16.86		#			
Temperature	C	0474	WL	08/04/2008	0001	10.3	-	19.7	16.06		#			
Temperature	C	0476	WL	08/04/2008	0001	10.3	-	19.7	16.19		#			
Temperature	C	0478	WL	08/04/2008	0001	9.6	-	23.9	16.31		#			
Temperature	C	0482	WL	08/05/2008	0001	55	-	55	19.12		#			
Temperature	C	0483	WL	08/05/2008	0001	18	-	18	17.71		#			
Temperature	C	0547	TS	08/06/2008	0001	0	-	0	20.67		#			
Temperature	C	0548	TS	08/06/2008	0001	0	-	0	22.84		#			
Temperature	C	0552	WL	08/06/2008	0001	18	-	18	16.51		#			
Temperature	C	0559	WL	08/05/2008	0001	18	-	18	15.49		#			
Temperature	C	0562	WL	08/12/2008	0001	1.3	-	2.3	21.56		#			
Temperature	C	0563	WL	08/12/2008	0001	4.6	-	5.6	19.05		#			
Temperature	C	0582	WL	08/05/2008	0001	18	-	18	15.64		#			
Temperature	C	0583	WL	08/05/2008	0001	18	-	18	16.76		#			
Temperature	C	0586	WL	08/05/2008	0001	18	-	18	17.99		#			
Temperature	C	0588	WL	08/05/2008	0001	34	-	34	17.44		#			
Temperature	C	0590	WL	08/13/2008	0001	1	-	2	19.83		#			

## Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 9/30/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Lab	Data QA		
Temperature	C	0591	WL	08/13/2008	0001	3.9	-	4.9	17.52		#		
Temperature	C	0603	WL	08/13/2008	0001	9.2	-	10.2	14.77		#		
Temperature	C	0606	WL	08/12/2008	0001	9.3	-	10.3	15.94		#		
Temperature	C	0670	WL	08/04/2008	0001	15.9	-	45.9	15.68		#		
Temperature	C	0673	WL	08/04/2008	0001	16.3	-	46.3	15.59		#		
Temperature	C	0674	WL	08/04/2008	0001	15.1	-	45.1	15.73		#		
Temperature	C	0676	WL	08/04/2008	0001	15.9	-	45.9	15.94		#		
Temperature	C	0678	WL	08/04/2008	0001	16.3	-	46.3	16.3		#		
Temperature	C	0682	WL	08/05/2008	0001	28	-	28	17.72		#		
Temperature	C	0685	WL	08/05/2008	0001	18	-	18	18.35		#		
Temperature	C	0688	WL	08/05/2008	0001	0	-	31	17.73		#		
Temperature	C	0689	WL	08/05/2008	0001	0	-	46	18.54		#		
Temperature	C	0731	WL	08/06/2008	0001	18	-	18	18.16		#		
Temperature	C	0733	WL	08/06/2008	0001	18	-	18	17.63		#		
Temperature	C	0771	WL	08/04/2008	0001	15	-	34.9	18.87		#		
Temperature	C	0772	WL	08/04/2008	0001	15.15	-	35.05	15.13		#		
Temperature	C	0774	WL	08/04/2008	0001	15.5	-	35.4	15.12		#		
Temperature	C	0776	WL	08/04/2008	0001	15.15	-	35.05	15.13		#		
Temperature	C	0779	WL	08/04/2008	0001	15.66	-	35.56	16		#		
Temperature	C	0780	WL	08/11/2008	0001	28	-	28	17.41		#		
Temperature	C	0783	WL	08/11/2008	0001	18	-	18	20.05		#		
Temperature	C	0784	WL	08/11/2008	0001	18	-	18	16.77		#		
Temperature	C	0785	WL	08/11/2008	0001	18	-	18	18.46		#		
Total Dissolved Solids	mg/L	0216	SL	08/12/2008	0001	0	-	0	600	J	#	20	
Total Dissolved Solids	mg/L	0240	SL	08/13/2008	0001	0	-	0	700	J	#	20	

## Appendix C. Water Quality Data (continued)

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 9/30/2008**

Parameter	Units	Location ID	Location Type	Sample		Depth Range		Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID	(Ft BLS)	Lab		Data	QA		
Total Dissolved Solids	mg/L	0403	WL	08/05/2008	0001	18	- 18	1200		#	40	
Total Dissolved Solids	mg/L	0403	WL	08/05/2008	0002	18	- 18	1100		#	40	
Total Dissolved Solids	mg/L	0404	WL	08/05/2008	0001	18	- 18	15000		#	400	
Total Dissolved Solids	mg/L	0407	WL	08/06/2008	0001	17	- 17	420		#	20	
Total Dissolved Solids	mg/L	0470	WL	08/04/2008	0001	10.3	- 19.7	4400		#	80	
Total Dissolved Solids	mg/L	0472	WL	08/04/2008	0001	10.3	- 19.7	9200		#	200	
Total Dissolved Solids	mg/L	0474	WL	08/04/2008	0001	10.3	- 19.7	10000		#	200	
Total Dissolved Solids	mg/L	0476	WL	08/04/2008	0001	10.3	- 19.7	9500		#	200	
Total Dissolved Solids	mg/L	0478	WL	08/04/2008	0001	9.6	- 23.9	12000		#	200	
Total Dissolved Solids	mg/L	0482	WL	08/05/2008	0001	55	- 55	79000		#	2000	
Total Dissolved Solids	mg/L	0483	WL	08/05/2008	0001	18	- 18	4100		#	80	
Total Dissolved Solids	mg/L	0547	TS	08/06/2008	0001	0	- 0	14000		#	400	
Total Dissolved Solids	mg/L	0548	TS	08/06/2008	0001	0	- 0	14000		#	400	
Total Dissolved Solids	mg/L	0552	WL	08/06/2008	0001	18	- 18	17000		#	400	
Total Dissolved Solids	mg/L	0552	WL	08/06/2008	0002	18	- 18	17000		#	400	
Total Dissolved Solids	mg/L	0559	WL	08/05/2008	0001	18	- 18	930		#	40	
Total Dissolved Solids	mg/L	0562	WL	08/12/2008	0001	1.3	- 2.3	1200	J	#	40	
Total Dissolved Solids	mg/L	0563	WL	08/12/2008	0001	4.6	- 5.6	740	J	#	20	
Total Dissolved Solids	mg/L	0582	WL	08/05/2008	0001	18	- 18	7000		#	200	
Total Dissolved Solids	mg/L	0583	WL	08/05/2008	0001	18	- 18	4600		#	80	
Total Dissolved Solids	mg/L	0586	WL	08/05/2008	0001	18	- 18	4300		#	80	
Total Dissolved Solids	mg/L	0588	WL	08/05/2008	0001	34	- 34	16000		#	400	
Total Dissolved Solids	mg/L	0590	WL	08/13/2008	0001	1	- 2	6800	J	#	200	
Total Dissolved Solids	mg/L	0591	WL	08/13/2008	0001	3.9	- 4.9	1900	J	#	40	
Total Dissolved Solids	mg/L	0603	WL	08/13/2008	0001	9.2	- 10.2	7000	J	#	200	

## Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 9/30/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Lab	Data QA		
Total Dissolved Solids	mg/L	0606	WL	08/12/2008	0001	9.3	-	10.3	750	J	#	40	
Total Dissolved Solids	mg/L	0670	WL	08/04/2008	0001	15.9	-	45.9	14000		#	200	
Total Dissolved Solids	mg/L	0673	WL	08/04/2008	0001	16.3	-	46.3	23000		#	400	
Total Dissolved Solids	mg/L	0674	WL	08/04/2008	0001	15.1	-	45.1	22000		#	400	
Total Dissolved Solids	mg/L	0676	WL	08/04/2008	0001	15.9	-	45.9	15000		#	400	
Total Dissolved Solids	mg/L	0678	WL	08/04/2008	0001	16.3	-	46.3	12000		#	200	
Total Dissolved Solids	mg/L	0682	WL	08/05/2008	0001	28	-	28	15000		#	400	
Total Dissolved Solids	mg/L	0685	WL	08/05/2008	0001	18	-	18	8000		#	200	
Total Dissolved Solids	mg/L	0688	WL	08/05/2008	0001	31	-	31	27000		#	400	
Total Dissolved Solids	mg/L	0689	WL	08/05/2008	0001	46	-	46	69000		#	2000	
Total Dissolved Solids	mg/L	0731	WL	08/06/2008	0001	18	-	18	3800		#	80	
Total Dissolved Solids	mg/L	0733	WL	08/06/2008	0001	18	-	18	3500		#	80	
Total Dissolved Solids	mg/L	0771	WL	08/04/2008	0001	15	-	34.9	5300		#	200	
Total Dissolved Solids	mg/L	0772	WL	08/04/2008	0001	15.15	-	35.05	10000		#	200	
Total Dissolved Solids	mg/L	0774	WL	08/04/2008	0001	15.5	-	35.4	14000		#	400	
Total Dissolved Solids	mg/L	0776	WL	08/04/2008	0001	15.15	-	35.05	11000		#	400	
Total Dissolved Solids	mg/L	0779	WL	08/04/2008	0001	15.66	-	35.56	25000		#	400	
Total Dissolved Solids	mg/L	0780	WL	08/11/2008	0001	28	-	28	15000	J	#	400	
Total Dissolved Solids	mg/L	0783	WL	08/11/2008	0001	18	-	18	6400	J	#	200	
Total Dissolved Solids	mg/L	0784	WL	08/11/2008	0001	18	-	18	840	J	#	20	
Total Dissolved Solids	mg/L	0785	WL	08/11/2008	0001	18	-	18	1100	J	#	40	
Turbidity	NTU	0403	WL	08/05/2008	0001	18	-	18	3.23		#		
Turbidity	NTU	0404	WL	08/05/2008	0001	18	-	18	4.71		#		
Turbidity	NTU	0407	WL	08/06/2008	0001	17	-	17	8.92		#		
Turbidity	NTU	0470	WL	08/04/2008	0001	10.3	-	19.7	5.64		#		

## Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 9/30/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Lab	Data QA		
Turbidity	NTU	0472	WL	08/04/2008	0001	10.3	-	19.7	5.03		#		
Turbidity	NTU	0474	WL	08/04/2008	0001	10.3	-	19.7	5.03		#		
Turbidity	NTU	0476	WL	08/04/2008	0001	10.3	-	19.7	10.4		#		
Turbidity	NTU	0478	WL	08/04/2008	0001	9.6	-	23.9	3.79		#		
Turbidity	NTU	0482	WL	08/05/2008	0001	55	-	55	5.86		#		
Turbidity	NTU	0483	WL	08/05/2008	0001	18	-	18	4.19		#		
Turbidity	NTU	0547	TS	08/06/2008	0001	0	-	0	3.97		#		
Turbidity	NTU	0548	TS	08/06/2008	0001	0	-	0	9.64		#		
Turbidity	NTU	0552	WL	08/06/2008	0001	18	-	18	8.6		#		
Turbidity	NTU	0559	WL	08/05/2008	0001	18	-	18	3.8		#		
Turbidity	NTU	0562	WL	08/12/2008	0001	1.3	-	2.3	30.4		#		
Turbidity	NTU	0563	WL	08/12/2008	0001	4.6	-	5.6	72.2		#		
Turbidity	NTU	0582	WL	08/05/2008	0001	18	-	18	4.71		#		
Turbidity	NTU	0583	WL	08/05/2008	0001	18	-	18	7.31		#		
Turbidity	NTU	0586	WL	08/05/2008	0001	18	-	18	4.1		#		
Turbidity	NTU	0588	WL	08/05/2008	0001	34	-	34	4.42		#		
Turbidity	NTU	0591	WL	08/13/2008	0001	3.9	-	4.9	190		#		
Turbidity	NTU	0603	WL	08/13/2008	0001	9.2	-	10.2	16.9		#		
Turbidity	NTU	0606	WL	08/12/2008	0001	9.3	-	10.3	236		#		
Turbidity	NTU	0670	WL	08/04/2008	0001	15.9	-	45.9	3.07		#		
Turbidity	NTU	0673	WL	08/04/2008	0001	16.3	-	46.3	3.65		#		
Turbidity	NTU	0674	WL	08/04/2008	0001	15.1	-	45.1	7.88		#		
Turbidity	NTU	0676	WL	08/04/2008	0001	15.9	-	45.9	4.53		#		
Turbidity	NTU	0678	WL	08/04/2008	0001	16.3	-	46.3	3.22		#		
Turbidity	NTU	0682	WL	08/05/2008	0001	28	-	28	9.13		#		

## Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 9/30/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Lab	Data QA		
Turbidity	NTU	0685	WL	08/05/2008	0001	18	-	18	2.54		#		
Turbidity	NTU	0688	WL	08/05/2008	0001	0	-	31	4.46		#		
Turbidity	NTU	0689	WL	08/05/2008	0001	0	-	46	2.66		#		
Turbidity	NTU	0731	WL	08/06/2008	0001	18	-	18	6.79		#		
Turbidity	NTU	0733	WL	08/06/2008	0001	18	-	18	7.43		#		
Turbidity	NTU	0771	WL	08/04/2008	0001	15	-	34.9	3.34		#		
Turbidity	NTU	0772	WL	08/04/2008	0001	15.15	-	35.05	3.65		#		
Turbidity	NTU	0774	WL	08/04/2008	0001	15.5	-	35.4	3.17		#		
Turbidity	NTU	0776	WL	08/04/2008	0001	15.15	-	35.05	2.63		#		
Turbidity	NTU	0779	WL	08/04/2008	0001	15.66	-	35.56	2.63		#		
Turbidity	NTU	0780	WL	08/11/2008	0001	28	-	28	5.25		#		
Turbidity	NTU	0783	WL	08/11/2008	0001	18	-	18	2.72		#		
Turbidity	NTU	0784	WL	08/11/2008	0001	18	-	18	4.9		#		
Turbidity	NTU	0785	WL	08/11/2008	0001	18	-	18	5.44		#		
Uranium	mg/L	0216	SL	08/12/2008	0001	0	-	0	0.0057	J	#	4.5E-006	
Uranium	mg/L	0240	SL	08/13/2008	0001	0	-	0	0.0065	J	#	4.5E-006	
Uranium	mg/L	0403	WL	08/05/2008	0001	18	-	18	0.22		#	9.E-005	
Uranium	mg/L	0403	WL	08/05/2008	0002	18	-	18	0.2		#	4.5E-005	
Uranium	mg/L	0404	WL	08/05/2008	0001	18	-	18	2.3		#	0.00022	
Uranium	mg/L	0407	WL	08/06/2008	0001	17	-	17	0.078		#	4.5E-006	
Uranium	mg/L	0470	WL	08/04/2008	0001	10.3	-	19.7	0.67		#	0.00022	
Uranium	mg/L	0472	WL	08/04/2008	0001	10.3	-	19.7	1.5		#	0.00022	
Uranium	mg/L	0474	WL	08/04/2008	0001	10.3	-	19.7	1.7		#	0.00022	
Uranium	mg/L	0476	WL	08/04/2008	0001	10.3	-	19.7	1.9		#	0.00022	
Uranium	mg/L	0478	WL	08/04/2008	0001	9.6	-	23.9	2.2		#	0.00022	

## Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 9/30/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID	(Ft BLS)	Lab	Data		QA			
Uranium	mg/L	0482	WL	08/05/2008	0001	55	-	55	1		#	9.E-005	
Uranium	mg/L	0483	WL	08/05/2008	0001	18	-	18	0.58		#	9.E-005	
Uranium	mg/L	0547	TS	08/06/2008	0001	0	-	0	1.9		#	0.00022	
Uranium	mg/L	0548	TS	08/06/2008	0001	0	-	0	1.8		#	0.00022	
Uranium	mg/L	0552	WL	08/06/2008	0001	18	-	18	2.9		#	0.00022	
Uranium	mg/L	0552	WL	08/06/2008	0002	18	-	18	3		#	0.00022	
Uranium	mg/L	0559	WL	08/05/2008	0001	18	-	18	0.15		#	2.2E-005	
Uranium	mg/L	0562	WL	08/12/2008	0001	1.3	-	2.3	0.097		J	#	4.5E-006
Uranium	mg/L	0563	WL	08/12/2008	0001	4.6	-	5.6	0.19		J	#	2.2E-005
Uranium	mg/L	0582	WL	08/05/2008	0001	18	-	18	0.88		#	0.00022	
Uranium	mg/L	0583	WL	08/05/2008	0001	18	-	18	0.81		#	0.00022	
Uranium	mg/L	0586	WL	08/05/2008	0001	18	-	18	0.8		#	9.E-005	
Uranium	mg/L	0588	WL	08/05/2008	0001	34	-	34	2		#	0.00022	
Uranium	mg/L	0590	WL	08/13/2008	0001	1	-	2	0.8		J	#	4.5E-005
Uranium	mg/L	0591	WL	08/13/2008	0001	3.9	-	4.9	0.4		J	#	9.E-005
Uranium	mg/L	0603	WL	08/13/2008	0001	9.2	-	10.2	1.1		J	#	0.00022
Uranium	mg/L	0606	WL	08/12/2008	0001	9.3	-	10.3	0.23		J	#	2.2E-005
Uranium	mg/L	0670	WL	08/04/2008	0001	15.9	-	45.9	2		#	0.00022	
Uranium	mg/L	0673	WL	08/04/2008	0001	16.3	-	46.3	2.3		#	0.00022	
Uranium	mg/L	0674	WL	08/04/2008	0001	15.1	-	45.1	2.5		#	0.00022	
Uranium	mg/L	0676	WL	08/04/2008	0001	15.9	-	45.9	2		#	0.00022	
Uranium	mg/L	0678	WL	08/04/2008	0001	16.3	-	46.3	1.7		#	0.00022	
Uranium	mg/L	0682	WL	08/05/2008	0001	28	-	28	2.3		#	0.00022	
Uranium	mg/L	0685	WL	08/05/2008	0001	18	-	18	1.9		#	0.00022	
Uranium	mg/L	0688	WL	08/05/2008	0001	31	-	31	3		#	0.00022	

## Appendix C. Water Quality Data (continued)

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 9/30/2008**

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Lab	Data QA		
Uranium	mg/L	0689	WL	08/05/2008	0001	46	-	46	1.3		#	0.00022	
Uranium	mg/L	0731	WL	08/06/2008	0001	18	-	18	0.88		#	0.00022	
Uranium	mg/L	0733	WL	08/06/2008	0001	18	-	18	0.73		#	0.00022	
Uranium	mg/L	0771	WL	08/04/2008	0001	15	-	34.9	0.71		#	0.00022	
Uranium	mg/L	0772	WL	08/04/2008	0001	15.15	-	35.05	0.91		#	0.00022	
Uranium	mg/L	0774	WL	08/04/2008	0001	15.5	-	35.4	1.7		#	0.00022	
Uranium	mg/L	0776	WL	08/04/2008	0001	15.15	-	35.05	0.8		#	0.00022	
Uranium	mg/L	0779	WL	08/04/2008	0001	15.66	-	35.56	1.1		#	0.00022	
Uranium	mg/L	0780	WL	08/11/2008	0001	28	-	28	2.3	J	#	0.00022	
Uranium	mg/L	0783	WL	08/11/2008	0001	18	-	18	1.3	J	#	0.00022	
Uranium	mg/L	0784	WL	08/11/2008	0001	18	-	18	0.14	J	#	2.2E-005	
Uranium	mg/L	0785	WL	08/11/2008	0001	18	-	18	0.078	J	#	4.5E-006	

Note: BLS = below land surface; C = centigrade; µmhos/cm = micromhos per centimeter; mV = millivolt; NTU = nephelometric turbidity unit; SL = surface location; S.U. = standard unit; TS = treatment system; WL = well

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

**LAB QUALIFIERS:**

- \* Replicate analysis not within control limits.
- > 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.
- D Analyte determined in diluted sample.
- E Inorganic: Estimate value because of interference, see case narrative.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- J Estimated.
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: TIC.
- P > 25% difference in detected pesticide or Aroclor concentrations between two columns.
- U Analytical result below detection limit.
- W Postdigestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- X,Y,Z Laboratory defined qualifier, see case narrative.

## Appendix C. Water Quality Data (continued)

### DATA QUALIFIERS:

F	Low-flow sampling method used.	G	Possible grout contamination, pH > 9.	J	Estimated value.
L	Less than three 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.

## Appendix C. Water Quality Data (continued)

**August 2008 Wood Chip Area General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 11/6/2008**

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
				Date	ID					Lab	Data	QA		
Alkalinity, Total (As CaCO3)	mg/L	0204	SL	08/27/2008	0001	0.33	-	0.33	240			#		
Alkalinity, Total (As CaCO3)	mg/L	0412	WL	08/26/2008	0001	9.5	-	9.5	470			#		
Alkalinity, Total (As CaCO3)	mg/L	0413	WL	08/25/2008	0001	9	-	9	280			#		
Alkalinity, Total (As CaCO3)	mg/L	0414	WL	08/26/2008	0001	7.5	-	7.5	450			#		
Alkalinity, Total (As CaCO3)	mg/L	AMM-1	WL	08/26/2008	0001	19	-	19	180			#		
Alkalinity, Total (As CaCO3)	mg/L	SMI-MW01	WL	08/26/2008	0001	16	-	16	630			#		
Alkalinity, Total (As CaCO3)	mg/L	SMI-PZ3S	WL	08/25/2008	0001	25	-	25	480			#		
Alkalinity, Total (As CaCO3)	mg/L	TP-01	WL	08/26/2008	0001	22	-	22	580			#		
Alkalinity, Total (As CaCO3)	mg/L	TP-02	WL	08/27/2008	0001	28	-	28	420			#		
Alkalinity, Total (As CaCO3)	mg/L	TP-20	WL	08/25/2008	0001	32	-	32	200			#		
Ammonia Total as N	mg/L	0204	SL	08/27/2008	0001	0.33	-	0.33	0.1	U		#	0.1	
Ammonia Total as N	mg/L	0411	WL	08/25/2008	0001	8	-	8	2			#	0.1	
Ammonia Total as N	mg/L	0412	WL	08/26/2008	0001	9.5	-	9.5	0.31			#	0.1	
Ammonia Total as N	mg/L	0413	WL	08/25/2008	0001	9	-	9	13			#	1	
Ammonia Total as N	mg/L	0414	WL	08/26/2008	0001	7.5	-	7.5	31			#	5	
Ammonia Total as N	mg/L	AMM-1	WL	08/26/2008	0001	19	-	19	0.1	U		#	0.1	
Ammonia Total as N	mg/L	SMI-MW01	WL	08/26/2008	0001	16	-	16	1.6			#	0.1	
Ammonia Total as N	mg/L	SMI-PZ3S	WL	08/25/2008	0001	25	-	25	3.8			#	0.1	
Ammonia Total as N	mg/L	TP-01	WL	08/26/2008	0001	22	-	22	0.1	U		#	0.1	
Ammonia Total as N	mg/L	TP-01	WL	08/26/2008	0002	22	-	22	0.1	U		#	0.1	
Ammonia Total as N	mg/L	TP-02	WL	08/27/2008	0001	28	-	28	0.28			#	0.1	
Ammonia Total as N	mg/L	TP-20	WL	08/25/2008	0001	32	-	32	3.3			#	0.1	

## Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 11/6/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Lab	Qualifiers		Detection Limit	Uncertainty
				Date	ID							Data		
Bromide	mg/L	0204	SL	08/27/2008	0001	0.33	-	0.33	0.2	U	#	0.2		
Bromide	mg/L	0411	WL	08/25/2008	0001	8	-	8	1.2		#	1		
Bromide	mg/L	0412	WL	08/26/2008	0001	9.5	-	9.5	1	U	#	1		
Bromide	mg/L	0413	WL	08/25/2008	0001	9	-	9	3.4		#	1		
Bromide	mg/L	0414	WL	08/26/2008	0001	7.5	-	7.5	1.1		#	1		
Bromide	mg/L	AMM-1	WL	08/26/2008	0001	19	-	19	2	U	#	2		
Bromide	mg/L	SMI-MW01	WL	08/26/2008	0001	16	-	16	1	U	#	1		
Bromide	mg/L	SMI-PZ3S	WL	08/25/2008	0001	25	-	25	1	U	#	1		
Bromide	mg/L	TP-01	WL	08/26/2008	0001	22	-	22	2	U	#	2		
Bromide	mg/L	TP-01	WL	08/26/2008	0002	22	-	22	2	U	#	2		
Bromide	mg/L	TP-02	WL	08/27/2008	0001	28	-	28	0.4	U	#	0.4		
Bromide	mg/L	TP-20	WL	08/25/2008	0001	32	-	32	20	U	#	20		
Chloride	mg/L	0204	SL	08/27/2008	0001	0.33	-	0.33	97		#	2		
Chloride	mg/L	0411	WL	08/25/2008	0001	8	-	8	360		#	20		
Chloride	mg/L	0412	WL	08/26/2008	0001	9.5	-	9.5	390		#	10		
Chloride	mg/L	0413	WL	08/25/2008	0001	9	-	9	680		#	10		
Chloride	mg/L	0414	WL	08/26/2008	0001	7.5	-	7.5	710		#	20		
Chloride	mg/L	AMM-1	WL	08/26/2008	0001	19	-	19	4000		#	100		
Chloride	mg/L	SMI-MW01	WL	08/26/2008	0001	16	-	16	540		#	10		
Chloride	mg/L	SMI-PZ3S	WL	08/25/2008	0001	25	-	25	930		#	20		
Chloride	mg/L	TP-01	WL	08/26/2008	0001	22	-	22	2700		#	40		
Chloride	mg/L	TP-01	WL	08/26/2008	0002	22	-	22	2800		#	40		
Chloride	mg/L	TP-02	WL	08/27/2008	0001	28	-	28	320		#	10		
Chloride	mg/L	TP-20	WL	08/25/2008	0001	32	-	32	65000		#	1000		

## Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 11/6/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Lab	Data QA		
Dissolved Oxygen	mg/L	0204	SL	08/27/2008	0001	0.33	-	0.33	7.68		#		
Dissolved Oxygen	mg/L	0411	WL	08/25/2008	0001	8	-	8	1.97		#		
Dissolved Oxygen	mg/L	0412	WL	08/26/2008	0001	9.5	-	9.5	2.76		#		
Dissolved Oxygen	mg/L	0413	WL	08/25/2008	0001	9	-	9	0.34		#		
Dissolved Oxygen	mg/L	0414	WL	08/26/2008	0001	7.5	-	7.5	0.57		#		
Dissolved Oxygen	mg/L	AMM-1	WL	08/26/2008	0001	19	-	19	1.78		#		
Dissolved Oxygen	mg/L	SMI-MW01	WL	08/26/2008	0001	16	-	16	0.48		#		
Dissolved Oxygen	mg/L	SMI-PZ3S	WL	08/25/2008	0001	25	-	25	0.22		#		
Dissolved Oxygen	mg/L	TP-01	WL	08/26/2008	0001	22	-	22	1.72		#		
Dissolved Oxygen	mg/L	TP-02	WL	08/27/2008	0001	28	-	28	0.79		#		
Dissolved Oxygen	mg/L	TP-20	WL	08/25/2008	0001	32	-	32	0.39		#		
Manganese	mg/L	0204	SL	08/27/2008	0001	0.33	-	0.33	0.0058		#	0.0002	
Manganese	mg/L	0411	WL	08/25/2008	0001	8	-	8	0.052		#	0.001	
Manganese	mg/L	0412	WL	08/26/2008	0001	9.5	-	9.5	0.0028	B	#	0.00041	
Manganese	mg/L	0413	WL	08/25/2008	0001	9	-	9	0.1		#	0.00041	
Manganese	mg/L	0414	WL	08/26/2008	0001	7.5	-	7.5	0.1		#	0.001	
Manganese	mg/L	AMM-1	WL	08/26/2008	0001	19	-	19	0.0014	B	#	0.001	
Manganese	mg/L	SMI-MW01	WL	08/26/2008	0001	16	-	16	0.47		#	0.00041	
Manganese	mg/L	SMI-PZ3S	WL	08/25/2008	0001	25	-	25	0.022	B	#	0.001	
Manganese	mg/L	TP-01	WL	08/26/2008	0001	22	-	22	0.95		#	0.001	
Manganese	mg/L	TP-01	WL	08/26/2008	0002	22	-	22	0.96		#	0.001	
Manganese	mg/L	TP-02	WL	08/27/2008	0001	28	-	28	0.33		#	0.00041	
Manganese	mg/L	TP-20	WL	08/25/2008	0001	32	-	32	0.41		#	0.01	

## Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 11/6/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Lab	Data QA		
Oxidation Reduction Potential	mV	0204	SL	08/27/2008	0001	0.33	-	0.33	-50		#		
Oxidation Reduction Potential	mV	0411	WL	08/25/2008	0001	8	-	8	-3.6		#		
Oxidation Reduction Potential	mV	0412	WL	08/26/2008	0001	9.5	-	9.5	-40		#		
Oxidation Reduction Potential	mV	0413	WL	08/25/2008	0001	9	-	9	16		#		
Oxidation Reduction Potential	mV	0414	WL	08/26/2008	0001	7.5	-	7.5	-11.8		#		
Oxidation Reduction Potential	mV	AMM-1	WL	08/26/2008	0001	19	-	19	-48		#		
Oxidation Reduction Potential	mV	SMI-MW01	WL	08/26/2008	0001	16	-	16	-57		#		
Oxidation Reduction Potential	mV	SMI-PZ3S	WL	08/25/2008	0001	25	-	25	15		#		
Oxidation Reduction Potential	mV	TP-01	WL	08/26/2008	0001	22	-	22	-132		#		
Oxidation Reduction Potential	mV	TP-02	WL	08/27/2008	0001	28	-	28	-107		#		
Oxidation Reduction Potential	mV	TP-20	WL	08/25/2008	0001	32	-	32	-138		#		
pH	s.u.	0204	SL	08/27/2008	0001	0.33	-	0.33	8.28		#		
pH	s.u.	0411	WL	08/25/2008	0001	8	-	8	7.37		#		
pH	s.u.	0412	WL	08/26/2008	0001	9.5	-	9.5	7.42		#		
pH	s.u.	0413	WL	08/25/2008	0001	9	-	9	7.57		#		
pH	s.u.	0414	WL	08/26/2008	0001	7.5	-	7.5	7.5		#		
pH	s.u.	AMM-1	WL	08/26/2008	0001	19	-	19	7.4		#		
pH	s.u.	SMI-MW01	WL	08/26/2008	0001	16	-	16	7.25		#		
pH	s.u.	SMI-PZ3S	WL	08/25/2008	0001	25	-	25	8.02		#		
pH	s.u.	TP-01	WL	08/26/2008	0001	22	-	22	7.11		#		
pH	s.u.	TP-02	WL	08/27/2008	0001	28	-	28	6.94		#		
pH	s.u.	TP-20	WL	08/25/2008	0001	32	-	32	7		#		

## Appendix C. Water Quality Data (continued)

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 11/6/2008**

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID	Lab	Data	QA					
Selenium	mg/L	0411	WL	08/25/2008	0001	8	-	8	0.14		#	0.00047	
Selenium	mg/L	0412	WL	08/26/2008	0001	9.5	-	9.5	0.064		#	0.00024	
Selenium	mg/L	0413	WL	08/25/2008	0001	9	-	9	0.3		#	0.0012	
Selenium	mg/L	0414	WL	08/26/2008	0001	7.5	-	7.5	0.089		#	0.00024	
Selenium	mg/L	AMM-1	WL	08/26/2008	0001	19	-	19	0.012		#	0.00012	
Selenium	mg/L	SMI-MW01	WL	08/26/2008	0001	16	-	16	0.0091		#	0.00012	
Selenium	mg/L	SMI-PZ3S	WL	08/25/2008	0001	25	-	25	0.03		#	0.00012	
Selenium	mg/L	TP-01	WL	08/26/2008	0001	22	-	22	0.0017		#	0.00012	
Selenium	mg/L	TP-01	WL	08/26/2008	0002	22	-	22	0.0019		#	0.00012	
Specific Conductance	µmhos/cm	0204	SL	08/27/2008	0001	0.33	-	0.33	1055		#		
Specific Conductance	µmhos/cm	0411	WL	08/25/2008	0001	8	-	8	6441		#		
Specific Conductance	µmhos/cm	0412	WL	08/26/2008	0001	9.5	-	9.5	2840		#		
Specific Conductance	µmhos/cm	0413	WL	08/25/2008	0001	9	-	9	3949		#		
Specific Conductance	µmhos/cm	0414	WL	08/26/2008	0001	7.5	-	7.5	4348		#		
Specific Conductance	µmhos/cm	AMM-1	WL	08/26/2008	0001	19	-	19	9965		#		
Specific Conductance	µmhos/cm	SMI-MW01	WL	08/26/2008	0001	16	-	16	3839		#		
Specific Conductance	µmhos/cm	SMI-PZ3S	WL	08/25/2008	0001	25	-	25	5194		#		
Specific Conductance	µmhos/cm	TP-01	WL	08/26/2008	0001	22	-	22	9716		#		
Specific Conductance	µmhos/cm	TP-02	WL	08/27/2008	0001	28	-	28	2526		#		
Specific Conductance	µmhos/cm	TP-20	WL	08/25/2008	0001	32	-	32	141645		#		

## Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 11/6/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID	Lab	Data	QA					
Sulfate	mg/L	0204	SL	08/27/2008	0001	0.33	-	0.33	300		#	5	
Sulfate	mg/L	0411	WL	08/25/2008	0001	8	-	8	1900		#	50	
Sulfate	mg/L	0412	WL	08/26/2008	0001	9.5	-	9.5	880		#	25	
Sulfate	mg/L	0413	WL	08/25/2008	0001	9	-	9	740		#	25	
Sulfate	mg/L	0414	WL	08/26/2008	0001	7.5	-	7.5	1300		#	50	
Sulfate	mg/L	AMM-1	WL	08/26/2008	0001	19	-	19	1100		#	50	
Sulfate	mg/L	SMI-MW01	WL	08/26/2008	0001	16	-	16	1300		#	25	
Sulfate	mg/L	SMI-PZ3S	WL	08/25/2008	0001	25	-	25	1000		#	50	
Sulfate	mg/L	TP-01	WL	08/26/2008	0001	22	-	22	2500		#	50	
Sulfate	mg/L	TP-01	WL	08/26/2008	0002	22	-	22	2500		#	50	
Sulfate	mg/L	TP-02	WL	08/27/2008	0001	28	-	28	780		#	25	
Sulfate	mg/L	TP-20	WL	08/25/2008	0001	32	-	32	5200		#	50	
Temperature	C	0204	SL	08/27/2008	0001	0.33	-	0.33	24.38		#		
Temperature	C	0411	WL	08/25/2008	0001	8	-	8	26.96		#		
Temperature	C	0412	WL	08/26/2008	0001	9.5	-	9.5	21.4		#		
Temperature	C	0413	WL	08/25/2008	0001	9	-	9	22.3		#		
Temperature	C	0414	WL	08/26/2008	0001	7.5	-	7.5	23.84		#		
Temperature	C	AMM-1	WL	08/26/2008	0001	19	-	19	24.99		#		
Temperature	C	SMI-MW01	WL	08/26/2008	0001	16	-	16	19.98		#		
Temperature	C	SMI-PZ3S	WL	08/25/2008	0001	25	-	25	19.04		#		
Temperature	C	TP-01	WL	08/26/2008	0001	22	-	22	18.81		#		
Temperature	C	TP-02	WL	08/27/2008	0001	28	-	28	17.06		#		
Temperature	C	TP-20	WL	08/25/2008	0001	32	-	32	20.31		#		

## Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 11/6/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Lab	Data QA		
Total Dissolved Solids	mg/L	0204	SL	08/27/2008	0001	0.33	-	0.33	680		#	20	
Total Dissolved Solids	mg/L	0411	WL	08/25/2008	0001	8	-	8	4700		#	200	
Total Dissolved Solids	mg/L	0412	WL	08/26/2008	0001	9.5	-	9.5	2200		#	80	
Total Dissolved Solids	mg/L	0413	WL	08/25/2008	0001	9	-	9	2500		#	80	
Total Dissolved Solids	mg/L	0414	WL	08/26/2008	0001	7.5	-	7.5	3400		#	80	
Total Dissolved Solids	mg/L	AMM-1	WL	08/26/2008	0001	19	-	19	7400		#	200	
Total Dissolved Solids	mg/L	SMI-MW01	WL	08/26/2008	0001	16	-	16	3100		#	80	
Total Dissolved Solids	mg/L	SMI-PZ3S	WL	08/25/2008	0001	25	-	25	3200		#	80	
Total Dissolved Solids	mg/L	TP-01	WL	08/26/2008	0001	22	-	22	8000		#	200	
Total Dissolved Solids	mg/L	TP-01	WL	08/26/2008	0002	22	-	22	7900		#	200	
Total Dissolved Solids	mg/L	TP-02	WL	08/27/2008	0001	28	-	28	1900		#	40	
Total Dissolved Solids	mg/L	TP-20	WL	08/25/2008	0001	32	-	32	110000		#	2000	
Turbidity	NTU	0411	WL	08/25/2008	0001	8	-	8	324		#		
Turbidity	NTU	0412	WL	08/26/2008	0001	9.5	-	9.5	9.86		#		
Turbidity	NTU	0413	WL	08/25/2008	0001	9	-	9	359		#		
Turbidity	NTU	0414	WL	08/26/2008	0001	7.5	-	7.5	9.98		#		
Turbidity	NTU	AMM-1	WL	08/26/2008	0001	19	-	19	6.77		#		
Turbidity	NTU	SMI-MW01	WL	08/26/2008	0001	16	-	16	23.5		#		
Turbidity	NTU	SMI-PZ3S	WL	08/25/2008	0001	25	-	25	9.4		#		
Turbidity	NTU	TP-01	WL	08/26/2008	0001	22	-	22	8.96		#		
Turbidity	NTU	TP-02	WL	08/27/2008	0001	28	-	28	53.6		#		
Turbidity	NTU	TP-20	WL	08/25/2008	0001	32	-	32	63.3		#		
Uranium	mg/L	0204	SL	08/27/2008	0001	0.33	-	0.33	0.0078		#	4.5E-006	
Uranium	mg/L	0411	WL	08/25/2008	0001	8	-	8	19		#	0.0022	

## Appendix C. Water Quality Data

**General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 11/6/2008**

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Lab	Data QA		
Uranium	mg/L	0412	WL	08/26/2008	0001	9.5	-	9.5	5.8		#	0.0009	
Uranium	mg/L	0413	WL	08/25/2008	0001	9	-	9	1.5		#	0.00045	
Uranium	mg/L	0414	WL	08/26/2008	0001	7.5	-	7.5	5.3		#	0.0009	
Uranium	mg/L	AMM-1	WL	08/26/2008	0001	19	-	19	0.007		#	4.5E-006	
Uranium	mg/L	SMI-MW01	WL	08/26/2008	0001	16	-	16	5		#	0.00045	
Uranium	mg/L	SMI-PZ3S	WL	08/25/2008	0001	25	-	25	1.4		#	0.00022	
Uranium	mg/L	TP-01	WL	08/26/2008	0001	22	-	22	0.19		#	4.5E-005	
Uranium	mg/L	TP-01	WL	08/26/2008	0002	22	-	22	0.19		#	4.5E-005	
Uranium	mg/L	TP-02	WL	08/27/2008	0001	28	-	28	2.3		#	0.00045	
Uranium	mg/L	TP-20	WL	08/25/2008	0001	32	-	32	0.027		#	4.5E-005	

Note: BLS = below land surface; C = centigrade;  $\mu$ mhos/cm = micromhos per centimeter; mV = millivolt; NTU = nephelometric turbidity unit; SL = surface location; S.U. = standard unit; TS = treatment system; WL = well

SAMPLE ID CODES: 000X = Filtered sample (0.45  $\mu$ m). N00X = Unfiltered sample. X = replicate number.

**LAB QUALIFIERS:**

- \* Replicate analysis not within control limits.
- > 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.
- D Analyte determined in diluted sample.
- E Inorganic: Estimate value because of interference, see case narrative.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- J Estimated
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: TIC.
- P > 25% difference in detected pesticide or Aroclor concentrations between two columns.
- U Analytical result below detection limit.
- W Postdigestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- X,Y,Z Laboratory defined qualifier, see case narrative.

**DATA QUALIFIERS:**

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

**QA QUALIFIER:**

- # Validated according to quality assurance guidelines.

**Appendix D.**  
**Water Level Data**

## Appendix D. Water Level Data

**August 2008 Monthly - STATIC WATER LEVELS (USEE700) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 10/27/2008**

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0403	O	3968.95	08/05/2008		14.85	3954.1	
0404	O	3968.3	08/05/2008		14.28	3954.02	
0407	O	3969.09	08/06/2008		15.69	3953.4	
0470		3964.12	08/04/2008		10.99	3953.13	
0472		3964.4	08/04/2008		11.97	3952.43	
0474		3964.99	08/04/2008		11.54	3953.45	
0476		3965.24	08/04/2008		13.05	3952.19	
0478		3964.91	08/04/2008		12.08	3952.83	
0482		3968.7	08/05/2008		15.45	3953.25	
0483		3968.9	08/05/2008		15.26	3953.64	
0552		3968.4	08/06/2008		14.71	3953.69	
0559		3969.92	08/05/2008		16.21	3953.71	
0562		3955.37	08/12/2008		1.41	3953.96	
0563		3958.04	08/12/2008		4.22	3953.82	
0582		3969.65	08/05/2008		14.85	3954.8	
0583		3969.64	08/05/2008		14.54	3955.1	
0586		3969.2	08/05/2008		14.39	3954.81	
0588		3968.82	08/05/2008		13.75	3955.07	
0590		3956.19	08/13/2008		1.66	3954.53	
0591		3955.2	08/13/2008		0.45	3954.75	
0603		3955.1	08/13/2008		0.1	3955	
0606		3955.69	08/12/2008		1.55	3954.14	
0670		3969.54	08/04/2008		14.9	3954.64	
0673		3969.44	08/04/2008		16.07	3953.37	
0674		3969.49	08/04/2008		16.52	3952.97	

## Appendix D. Water Level Data (continued)

**August 2008 Monthly - STATIC WATER LEVELS (USEE700) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 10/27/2008**

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0676		3969.69	08/04/2008		15.42	3954.27	
0678		3969.65	08/04/2008		15.61	3954.04	
0682		3970.18	08/05/2008		15.99	3954.19	
0685		3968.76	08/05/2008		14.23	3954.53	
0688		3968.66	08/05/2008		14.64	3954.02	
0689		3968.66	08/05/2008		14.57	3954.09	
0731		3968.77	08/06/2008		14.29	3954.48	
0733		3968.5	08/06/2008		13.23	3955.27	
0771		3969.04	08/04/2008		16.12	3952.92	
0772		3969.21	08/04/2008		16.48	3952.73	
0774		3968.77	08/04/2008		15.55	3953.22	
0776		3968.97	08/04/2008		15.85	3953.12	
0779		3968.43	08/04/2008		14.85	3953.58	
0780		3968.45	08/11/2008		14.59	3953.86	
0783		3968.82	08/11/2008		15.01	3953.81	
0784		3968.73	08/11/2008		14.81	3953.92	
0785		3969.24	08/11/2008		14.75	3954.49	

Flow Codes: B = background; C = cross gradient; D = downgradient; O = on site; U = upgradient  
 Water Level Flags: D = dry

## Appendix D. Water Level Data (continued)

**August 2008 Wood Chip Area - STATIC WATER LEVELS (USEE700) FOR SITE MOA01, Moab Site**  
**REPORT DATE: 11/6/2008**

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0411	O	3964.88	08/25/2008		6.84	3958.04	
0412	O	3965.76	08/26/2008		9.32	3956.44	
0413	O	3965.33	08/25/2008		8.05	3957.28	
0414	O	3963.2	08/26/2008		7	3956.2	
AMM-1	U	3972.02	08/26/2008		14.9	3957.12	
SMI-MW01	O	3968.32	08/26/2008		12.42	3955.9	
SMI-PZ3S	O	3975.03	08/25/2008		17.52	3957.51	
TP-01	O	3969.39	08/26/2008		11.72	3957.67	
TP-02	O	3975.55	08/27/2008		19.95	3955.6	
TP-20	D	3967.55	08/25/2008		14.35	3953.2	

Flow Codes: B = background; C = cross gradient; D = downgradient; O = on site; U = upgradient  
 Water Level Flags: D = dry

**Attachment 1.**  
**Interim Action Well Field Monthly Sampling**

**Attachment 1.**  
**Interim Action Well Field Monthly Sampling**



DATE: August 28, 2008  
TO: K. Pill, M. Mullis  
FROM: E. Glowiak  
SUBJECT: Trip Report

**Site:** Moab – Interim Action Well Field Monthly Sampling – August 2008

**Date of Sampling Event:** August 4-13, 2008

**Team Members:** Steve Back, James Ritchey, Elizabeth Glowiak

**RIN Number Assigned:** All samples were assigned to RIN 0808020.

**Sample Shipment:** All samples were shipped in a cooler overnight UPS to Paragon Analytics, Inc. from Moab, Utah, on August 6 and 13 (Tracking Nos. 92522510, 95210664).

**August 2008 CF1 Sampling**

---

**Number of Locations Sampled:** Five extraction wells (0470, 0472, 0474, 0476, and 0478), six observation wells (0403, 0407, 0482, 0483, 0552, and 0559), three well points (0562, 0606, and 0563), one surface water location (0216), and two evaporation pond (0547 and 0548) locations were sampled during the August 2008 sampling event. Including two duplicates, a total of 19 samples were collected from CF1 during the August monthly sampling event.

**Quality-Control Sample Cross Reference:** Following are the false identifications assigned to the quality-control samples:

False ID	True ID	Sample Type	Associated Matrix	Ticket Number
2359	0552	Duplicate from 18 ft bgs	Ground Water	NFC 808
2357	0403	Duplicate from 18 ft bgs	Ground Water	NFC 801

Note: ID = identification

**Attachment 1.**  
**Interim Action Well Field Monthly Sampling (continued)**

**Locations Not Sampled:** The following locations were not sampled during the August 2008 sampling event.

Location No.	Type	Reason
0608, 0611, 0612, 0564, 0565, 0607	Well Points	Inaccessible due to high river flow
0245	Surface Water	Inaccessible

**Field Variance:** None

**Location-Specific Information – CF1 Extraction Wells:** Extraction wells were sampled using dedicated submersible pumps.

Well No.	Date	Time	Water Level (ft btoc)	Pump Intake (ft bgs)
0470	08/04/2008	11:11	10.99	18
0472	08/04/2008	11:20	11.97	18
0474	08/04/2008	11:33	11.54	18
0476	08/04/2008	11:42	13.05	18
0478	08/04/2008	11:54	12.08	23

Note: btoc = below top of casing

**Location-Specific Information – Observation Wells:** All observation wells were sampled using micropurge techniques with a peristaltic pump and dedicated downhole and pump-head tubing. Sample depths and water levels for each observation well are listed below.

Well No.	Date	Time	Depth to Water (ft btoc)	Sample Depth (ft bgs)
0403	08/05/2008	14:19	14.85	18
0407	08/06/2008	10:42	15.69	17
0482	08/05/2008	15:25	15.45	55
0483	08/05/2008	14:45	15.26	18
0552	08/06/2008	10:16	14.71	18
0559	08/05/2008	15:04	16.21	18

Note: btoc = below top of casing

**Location-Specific Information – Well Point Sampling:** The table below presents the water level, stick up height, and depth to the river surface prior to the initial purge.

WP No.	Date	Time	Depth to Water (ft btoc)	Stick Up Height (ft)	Depth to River Surface (ft btoc)
0562	08/12/2008	15:13	1.41	In water	1.25
0563	08/12/2008	15:36	4.22	3.0	Dry at base
0606	08/12/2008	15:26	1.55	1.00	Dry at base

Note: btoc = below top of casing; WP = well point

**Attachment 1.  
Interim Action Well Field Monthly Sampling (continued)**

**Location-Specific Information – Surface Water Sampling:** The table below represents the surface water locations sampled.

SW No.	Date	Time	Depth (inches below surface)	Characteristics
0216	08/12/2008	15:45	Unknown	Open both up and down river, moderate flow, high turbidity

Note: SW = surface water



*Surface Water Location 0216 and CF1 River Bank Well Points*

**August 2008 CF2 Sampling**

**Number of Locations Sampled:** Four observation wells (0582, 0583, 0586, and 0588), three well points (0590, 0591, and 0603) and one surface water location (0240) were sampled. A total of eight samples were collected.

**Locations Not Sampled:** The following locations were not sampled during the August 2008 sampling event.

Location No.	Type	Reason
0571, 0573, 0575, 0577, 0579	Remediation Wells	Not running
0613, 0614, 0605, 0604, 0605, 0615, 0616	Well Points	Inaccessible due to high river flow
0236, 0239	Surface Water	0236 was dry and 0239 was inaccessible due to high river flow

**Field Variance:** None

**Attachment 1.**  
**Interim Action Well Field Monthly Sampling (continued)**

**Location-Specific Information – Observation Wells:** All observation wells were sampled using micropurge techniques with a peristaltic pump and dedicated pump-head and downhole tubing. Sample depths and water levels for each observation well are listed below.

Well No.	Date	Time	Depth to Water (ft btoc)	Sample Depth (ft bgs)
0582	08/05/2008	11:39	14.85	18
0583	08/05/2008	11:19	14.54	18
0586	08/05/2008	10:36	14.39	18
0588	08/05/2008	11:00	13.75	34

Note: btoc = below top of casing

**Location-Specific Information – Well Point Sampling:** The table below presents the water level, stick up height, and depth to the river surface prior to the initial purge.

WP No.	Date	Time	Depth to Water (ft btoc)	Stick Up Height (ft)	Depth to River Surface (ft btoc)
0590	08/13/2008	08:45	1.66	In water	0.80
0591	08/13/2008	08:20	0.45	In water	0.85
0603	08/13/2008	08:33	0.1	In water	0.66

Note: btoc = below top of casing; WP = well point

**Location-Specific Information – Surface Water Sampling:** The table below represents the surface water locations sampled.

SW No.	Date	Time	Depth (inches below surface)	Characteristics
0240	08/13/2008	08:08	Unknown	Approximately 1 ft deep, stagnant, fish present, closed off up and down river, not a habitat area

Note: SW = surface water

**Attachment 1.  
Interim Action Well Field Monthly Sampling (continued)**



*Surface Water Location 0240 and CF2 River Bank Well Points*

**August 2008 CF3 Sampling**

**Number of Locations Sampled:** Five remediation wells (0670, 0673, 0674, 0676, and 0678), and five observation wells (0682, 0688-31, 0689-46, 0404, and 0685) were sampled during the August 2008 sampling event. A total of 10 locations were sampled.

**Locations Not Sampled:** The following locations were not sampled during the August 2008 sampling event.

Location No.	Type	Reason
0693, 0694, 0695, 0696, 0697, 0698	Well Points	Inaccessible due to high river flow
0257, 0258	Surface Water	Dry

**Field Variance:** None.

**Location-Specific Information – CF3 Remediation Wells:** Extraction wells were sampled using dedicated submersible pumps.

Well No.	Date	Time	Water Level (ft btoc)	Pump Intake (ft bgs)
0670	08/04/2008	14:01	14.90	35
0673	08/04/2008	14:05	16.07	35
0674	08/04/2008	14:20	16.52	35
0676	08/04/2008	14:43	15.42	35
0678	08/04/2008	14:53	15.61	35

Note: btoc = below top of casing

**Attachment 1.**  
**Interim Action Well Field Monthly Sampling (continued)**

**Location Specific Information – Observation Wells:** All observation wells were sampled using micropurge techniques with a peristaltic pump and dedicated pump-head and downhole tubing. Sample depths and water levels for each observation well are listed below.

Well No.	Date	Time	Depth to Water (ft btoc)	Sample Depth (ft bgs)
0404	08/05/2008	08:44	14.28	18
0682	08/05/2008	09:26	15.99	28
0685	08/05/2008	09:07	14.23	18
0688-31	08/05/2008	08:22	14.64	31
0689-46	08/05/2008	08:04	14.57	46

Note: btoc = below top of casing

**August 2008 CF4 Sampling**

**Number of Locations Sampled:** Five remediation wells (0771, 0772, 0773, 0775, and 0779) and four observation wells (0780, 0783, 0784, and 0785) were sampled during the August 2008 sampling event. A total of nine samples were collected.

**Locations Not Sampled:** The following locations were not sampled during the August 2008 sampling event.

Location No.	Type	Reason
0790, 0791, 0792, 0793, 0794, 0795	Well Points	Inaccessible due to high river flow
0274	Surface Water	Inaccessible due to high river flow

**Field Variance:** None.

**Location-Specific Information – CF4 Remediation Wells:** Extraction wells were sampled using dedicated submersible pumps.

Well No.	Date	Time	Water Level (ft btoc)	Pump Intake (ft bgs)
0771	08/04/2008	09:37	16.12	30
0772	08/04/2008	09:49	16.48	30
0774	08/04/2008	09:56	15.55	30
0776	08/04/2008	10:10	15.85	30
0779	08/04/2008	10:23	14.85	30

Note: btoc = below top of casing

**Attachment 1.**  
**Interim Action Well Field Monthly Sampling (continued)**

**Location-Specific Information – Observation Wells:** All observation wells were sampled using micropurge techniques with a peristaltic pump and dedicated pump-head and downhole tubing. Sample depths and water levels for each observation well are listed below.

Well No.	Date	Time	Depth to Water (ft btoc)	Sample Depth (ft bgs)
0780	08/11/2008	14:28	14.59	28
0783	08/11/2008	15:53	15.01	18
0784	08/11/2008	14:51	14.81	18
0785	08/11/2008	16:23	14.75	18

Note: btoc = below top of casing

**August 2008 Infiltration Trench Sampling**

**Number of Locations Sampled:** Two observation wells (0731 and 0733) were sampled during the August 2008 sampling event.

**Field Variance:** None.

**Location-Specific Information – Observation Wells:** All observation wells were sampled using micropurge techniques with a peristaltic pump and dedicated pump-head and downhole tubing. Sample depths and water levels for each observation well are listed below.

Well No.	Date	Time	Depth to Water (ft btoc)	Sample Depth (ft bgs)
0731	08/06/2008	11:19	14.29	18
0733	08/06/2008	11:42	13.23	18

Note: btoc = below top of casing

**Well Inspection Summary:** A well inspection was not conducted.

**Site Issues:** According to the USGS Cisco gaging station (Station No. 09180500), the mean daily Colorado River flows during this sampling event are provided below:

Date	Daily Mean Flow (cfs)
08/04/2008	4,900
08/05/2008	4,710
08/06/2008	4,600
08/11/2008	6,610
08/12/2008	6,290
08/13/2008	5,920

**Equipment Issues:** None.

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

**Attachment 2.**  
**Wood Chip Area Sampling Event**

**Attachment 2.**  
**Wood Chip Area Sampling Event**



DATE: September 8, 2008

TO: K. Pill, M. Mullis

FROM: E. Glowiak

SUBJECT: Trip Report

**Site:** Moab – Wood Chip Area Sampling Event – August 2008

**Date of Sampling Event:** August 25-27, 2008

**Team Members:** Steve Back, Elizabeth Glowiak

**RIN Number Assigned:** All samples were assigned to RIN 0808021.

**Sample Shipment:** All samples were shipped in a cooler overnight UPS to Paragon Analytics, Inc. from Moab, Utah, on August 27 (Tracking No. 92826568).

**Summary:** The purpose of this event was to sample various locations to determine uranium contaminant plume concentrations outside of the interim action well field. Many of these locations have not been sampled recently. One week prior to the sampling event, the bottom of the wells were cleaned out with dedicated tubing and a peristaltic pump.

**August 2008 Wood Chip Area Sampling Event**

---

**Number of Locations Sampled:** Ten observation wells (0411, 0412, 0413, 0414, AMM-1, SMI-MW01, SMI-PZ3S, TP-01, TP-02, and TP-20) and one surface water location (0204) were sampled during this event. Including one duplicate, a total of 12 samples were collected during the wood chip area sampling event.

**Quality-Control Sample Cross Reference:** Following are the false identifications assigned to the quality-control samples:

False ID	True ID	Sample Type	Associated Matrix	Ticket Number
2118	TP-01	Duplicate from 22 ft bgs	Ground Water	NFC 348

Note: ID = identification

**Locations Not Sampled:** None.

**Attachment 2.**  
**Wood Chip Area Sampling Event (continued)**

**Field Variance:** None

**Location-Specific Information – Observation Wells:** All observation wells were sampled using micropurge techniques with a peristaltic pump and dedicated downhole and pump-head tubing. Sample depths and water levels for each observation well are listed below.

Well No.	Date	Time	Depth to Water (ft btoc)	Sample Depth (ft bgs)
0411	08/25/2008	10:50	6.84	8
0412	08/26/2008	08:30	9.32	9.5
0413	08/25/2008	10:35	8.05	9
0414	08/26/2008	08:00	7.00	7.5
AMM-1	08/26/2008	10:56	14.90	19
SMI-MW01	08/26/2008	09:00	12.42	16
SMI-PZ3S	08/25/2008	10:00	17.52	25
TP-01	08/26/2008	12:50	11.72	22
TP-02	08/27/2008	08:14	19.95	28
TP-20	08/25/2008	16:25	14.35	32

Note: btoc = below top of casing

**Location-Specific Information – Surface Water Sampling:** The table below represents the surface water locations sampled.

SW No.	Date	Time	Depth (inches below surface)	Characteristics
0204	08/27/2008	08:55	Approximately 4 inches	Taken 1 ft off bank, moderate flow

Note: SW = surface water

**Well Inspection Summary:** A well inspection was not conducted.

**Site Issues:** According to the USGS Cisco gaging station (Station No. 09180500), the mean daily Colorado River flows during this sampling event are provided below:

Date	Daily Mean Flow (cfs)
08/25/2008	3,990
08/26/2008	3,970
08/27/2008	3,940

**Equipment Issues:** None.

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