

Office of Environmental Management – Grand Junction



Moab UMTRA Project
March 2010 Validation Data Package for
Performance Assessment of the
Monthly Sampling for the Ground Water
Interim Action

May 2010



U.S. Department
of Energy

Office of Environmental Management

**Moab UMTRA Project
March 2010 Validation Data Package for Performance Assessment
of the Monthly Sampling for the
Ground Water Interim Action**

May 2010

**Moab UMTRA Project
March 2010 Monthly Ground Water Sampling Event**

Revision 0

Review and Approval

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Revision History

Revision No.	Date	Reason/Basis for Revision
0	May 2010	Initial issue.

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Acronyms and Abbreviations

°C	degrees centigrade
CF	Configuration
cfs	cubic feet per second
COC	chain of custody
EB	equipment blank
EDD	electronic data deliverable
EPA	U.S. Environmental Protection Agency
IA	interim action
ICP	inductively coupled plasma
LCS	laboratory control sample
MB	method blank
MDC	minimum detectable concentration
MS	matrix spike
MSD	matrix spike duplicate
RIN	report identification number
RL	reporting limit
RPD	relative percent difference
RS	replicate sample
SD	serial dilution
SDG	sample data group
TDS	total dissolved solids
TPU	total propagated uncertainty
UMTRA	Uranium Mill Tailings Remedial Action
UMTRCA	Uranium Mill Tailings Radiation control Act
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* (STO 6), “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, the Sampling Event Summary, and the Sampling and Analysis. Section 2 provides the Data Assessment Summaries, including the Field Activity Verification, Laboratory Performance Assessment, Field Analyses/Activities description, and the 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 Sampling Field Activities Verification, Water Quality Data, Water Level Data, and the Minimums and Maximums Report. Attachment 1 contains the trip report. All Colorado River flow discussed in this document is measured from the U.S. Geological Survey (USGS) Cisco gauging station No. 09180500.

This validation data package (VDP) presents the results of the March 2010 monthly sampling event completed from February 25 through March 4, 2010, in which ground water samples were collected primarily from a variety of well points and surface water locations adjacent to the well field. Section 1.0 contains the Summary Criteria with a sample location map (Section 1.1), the Sampling Event Summary (Section 1.2), and the Sampling and Analyses (Section 1.3) for this March 2010 monthly sampling event.

1.1 Summary Criteria

Sampling Period: February 25 through March 4, 2010

The purpose of this sampling was to collect data that can be used to evaluate the performance of the ground water interim action (IA) well field. All sampling locations are shown on Figures 1 and 2, and a summary of the site conditions is presented in Figure 3.

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

Yes. There were 19 results (three of which were duplicates) from six different locations that were all considered anomalously high based on the Minimums and Maximums Report.

2. Were all IA well field pumps operating within the planned parameters?

Yes. All extraction wells were shut down during this sampling event, as the discharge line connecting the well field to the pond was disconnected.

3. Was the evaporation pond functioning properly?

Yes. The pond level was from 8.4 to 8.7 feet during this sampling event.

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

No. Surface water locations 0216, 0236, 0240, and 0258 were dry. Well point location 0698 was dry, and locations 0494 and 0497 did not recharge sufficiently to provide a sample. Configuration (CF) 4 well points 0794 and 0795 did not have an adequate volume of water to purge or collect a sample.

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

Yes. As a result of the soil remediation taking place in the off-pile area between the toe of the pile and the well field, the discharge line from the well field to the evaporation pond was disconnected.

1.2 Sampling Event Summary

This VDP presents the validated data associated with the ground water and surface water samples collected during the March 2010 IA 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 (Sections 2.1 and 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 4 in Section 2.2. No data were rejected (flagged as “R”) as a result of this validation process. A Minimums and Maximums Report (presented in Section 3.1) was generated to determine if the data are within a normal statistical range. Based on the results of the Minimums and Maximums Report, there were six locations with a total of 19 analytical results that were considered anomalous (see Anomalous Data Review in Section 3.2).

The March 2010 sampling event focused on the collection of surface water samples and ground water samples collected from the river bed well points (as opposed to monitoring wells). During this sampling event, the Colorado River flows were below the average base flow of approximately 3,000 cfs, and it is under these conditions that ground water discharge occurs into the side channels off the well field. All surface water samples collected were from areas that did not meet the definition of a habitat, and were collected for information purposes only.

A brief summary of the ammonia and uranium surface water results and comparisons to applicable standards is presented. In addition, the most recent concentration trends are provided for the Baseline Area, CF3, CF2, and CF4 (listed from north to south) well points. These data are pertinent as they represent the contaminant source of the water that discharges into the surface water under these low river stage conditions. Time versus concentration plots for ammonia, total dissolved solids [TDS], and uranium are provided over the past two years for concentrations measured in samples collected from both the surface water locations and well points.

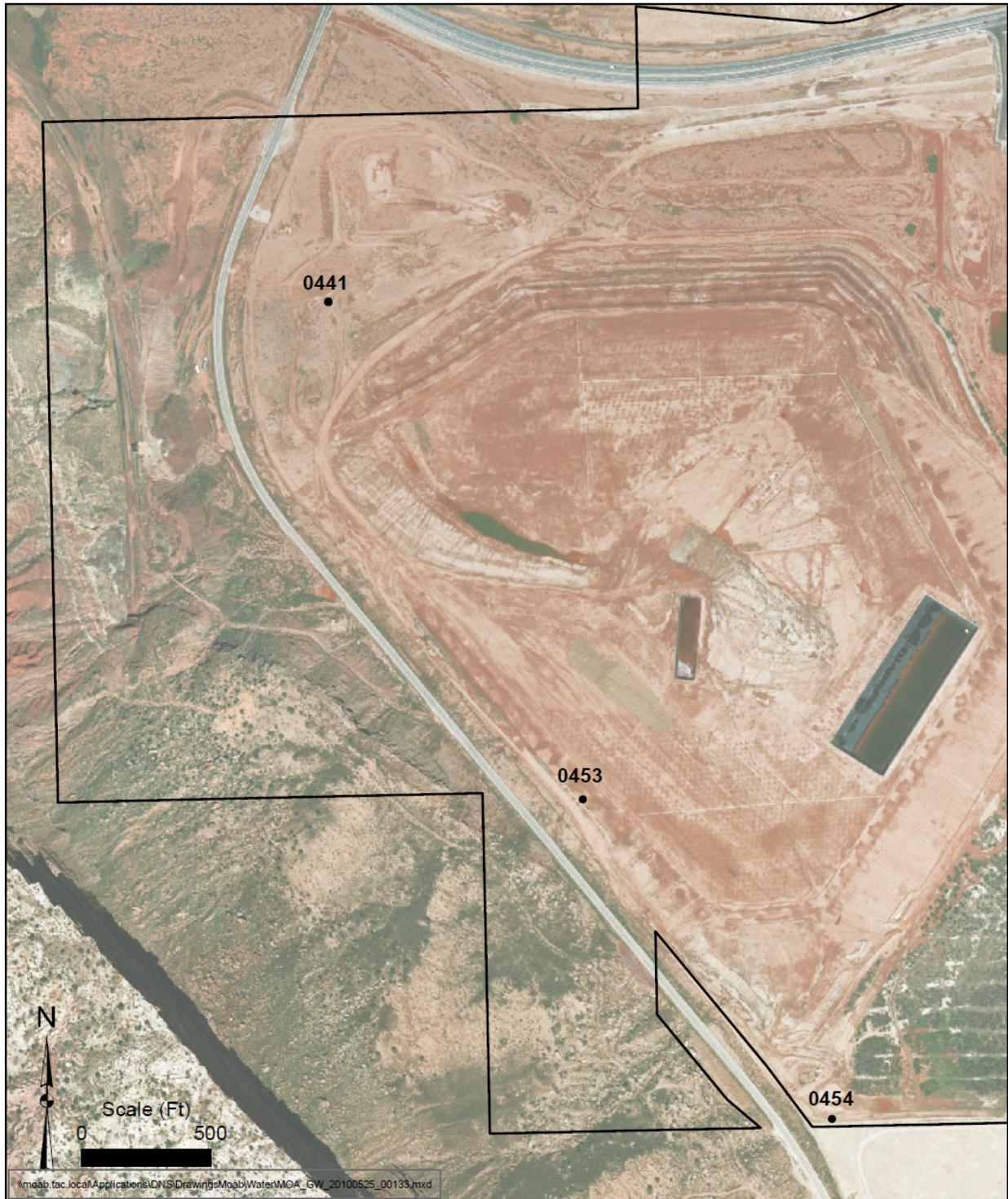


Figure 2. Map of Recently Installed Monitoring Wells Sampled During the March 2010 Sampling Event

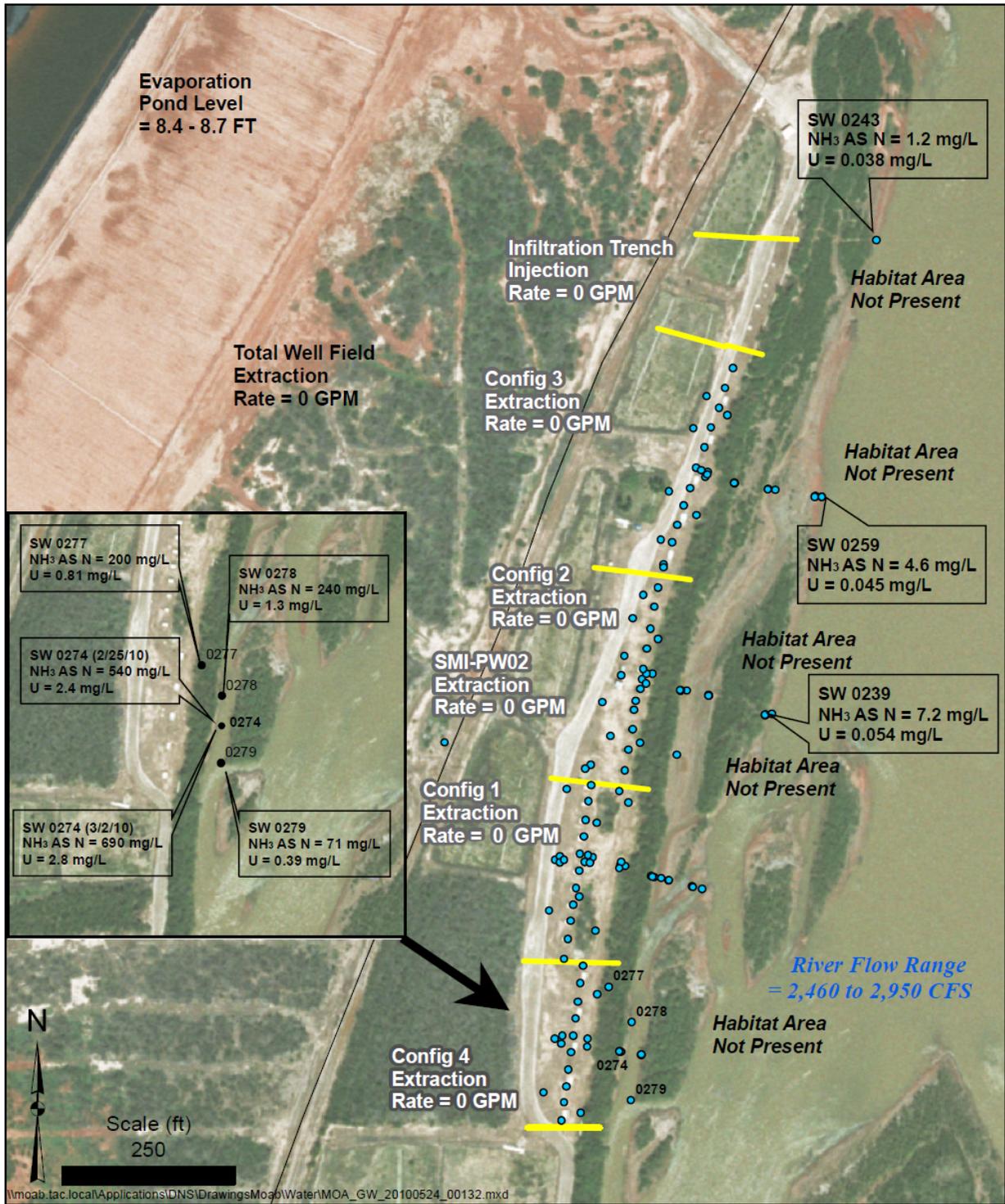


Figure 3. March 2010 Sampling Event Site Conditions

Baseline Area

Figures 4, 5, and 6 provide the ammonia, TDS, and uranium concentrations (respectively) measured in well points 0617, 0618, and 0599, all of which are located 80 feet off the bank (near the river's edge) and adjacent to surface water location 0243. In general, the surface water concentrations do not appear to be significantly impacted by the ground water concentrations. Ammonia and TDS ground water concentrations have gradually increased since September 2009, while the uranium concentrations have not significantly changed over the past 2 years. This trend is similar to a pattern that was exhibited previously when the concentrations tend to reach a maximum after prolonged river base-flow conditions, just prior to the spring runoff.

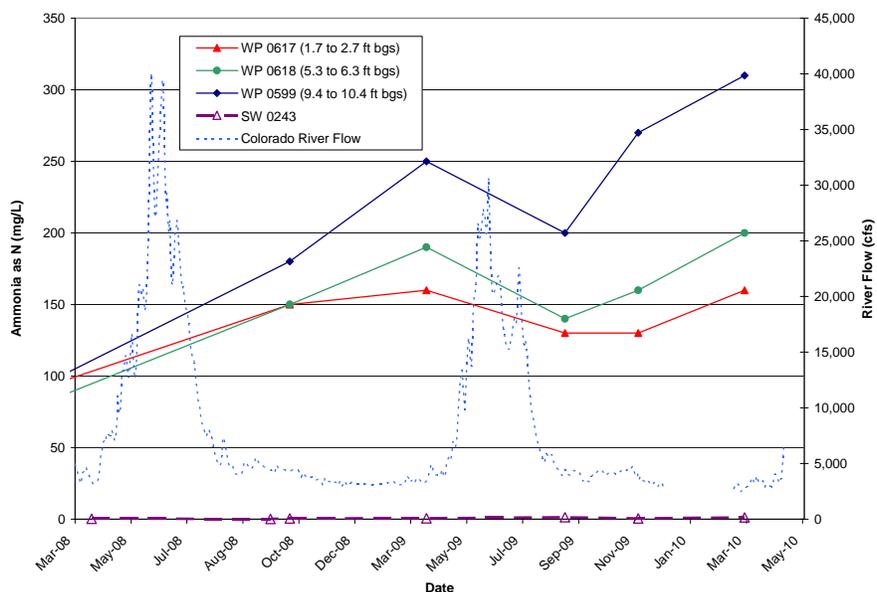


Figure 4. Baseline Area Surface Water Location 0243 and Wellpoints 0617, 0618, and 0599 Time Versus Ammonia Total (as N) Concentration Plot

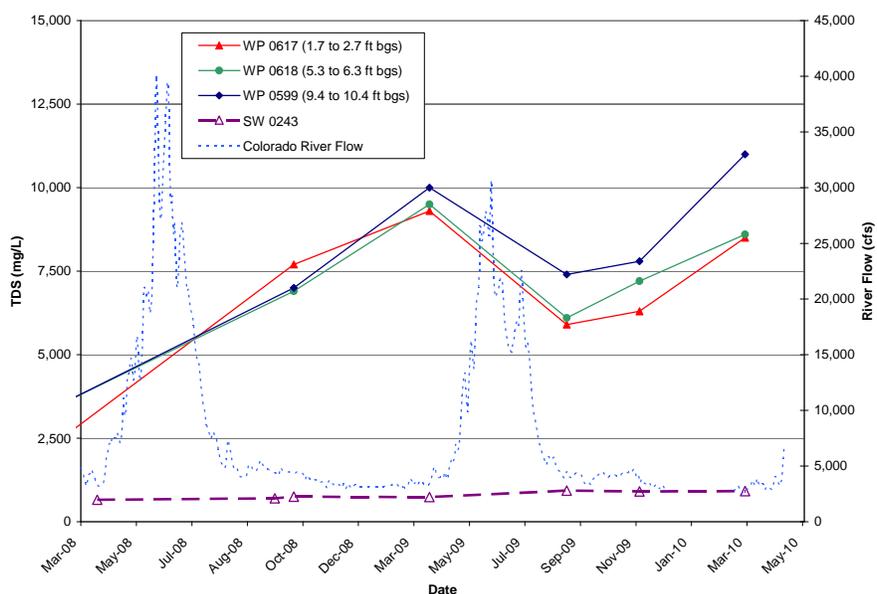


Figure 5. Baseline Area Surface Water Location 0243 and Wellpoints 0617, 0618, and 0599 Time Versus TDS Concentration Plot

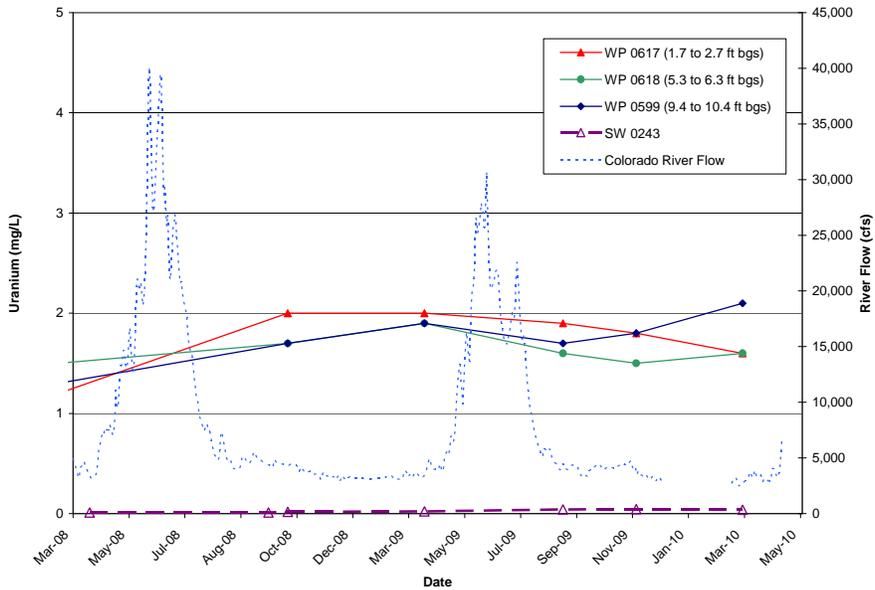


Figure 6. Baseline Area Surface Water Location 0243 and Wellpoints 0617, 0618, and 0599 Time Versus Uranium Concentration Plot

CF3

Figures 7, 8, and 9 provide the ammonia, TDS, and uranium concentrations (respectively) for well points 0696 and 0697, which are located 120 feet off the bank (near the river’s edge), and adjacent to surface water location 0259. Similar to the Baseline Area, the surface water concentrations do not appear to be significantly impacted by the ground water concentrations in this vicinity of the well field. A comparable gradual increase in the ground water contaminants since September 2009 is exhibited.

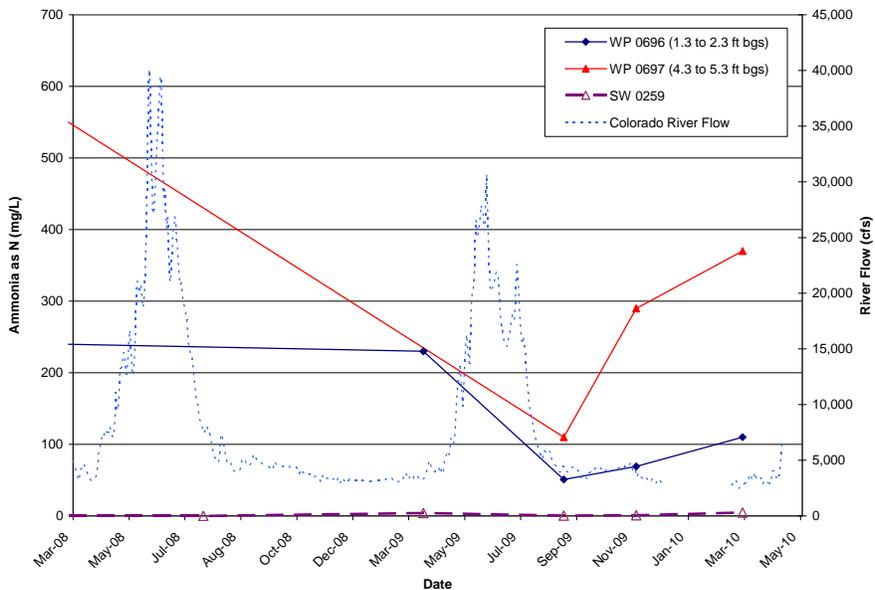


Figure 7. CF3 Surface Water Location 0259 and Wellpoints 0696 and 0697 Time Versus Ammonia Total (as N) Concentration Plot

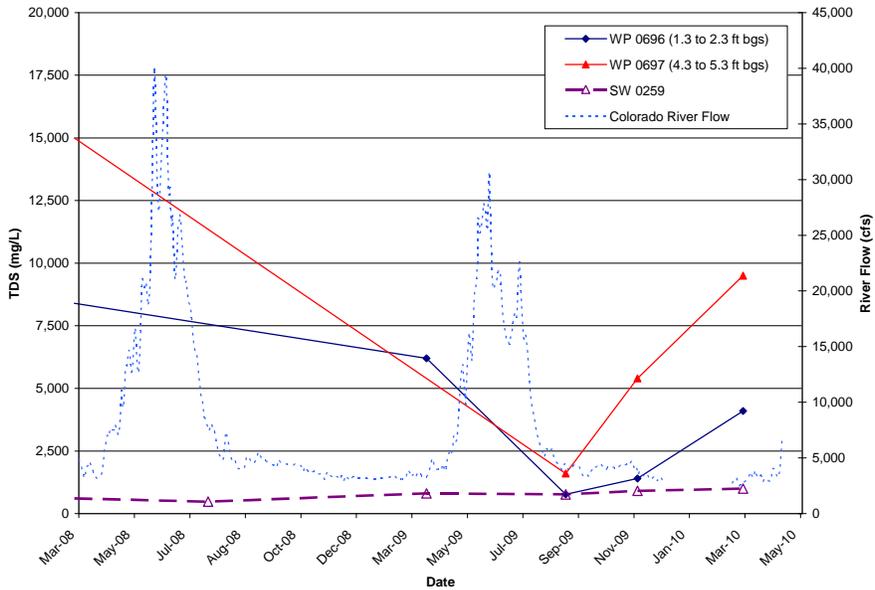


Figure 8. CF3 Surface Water Location 0259 and Wellpoints 0696 and 0697 Time Versus TDS Concentration Plot

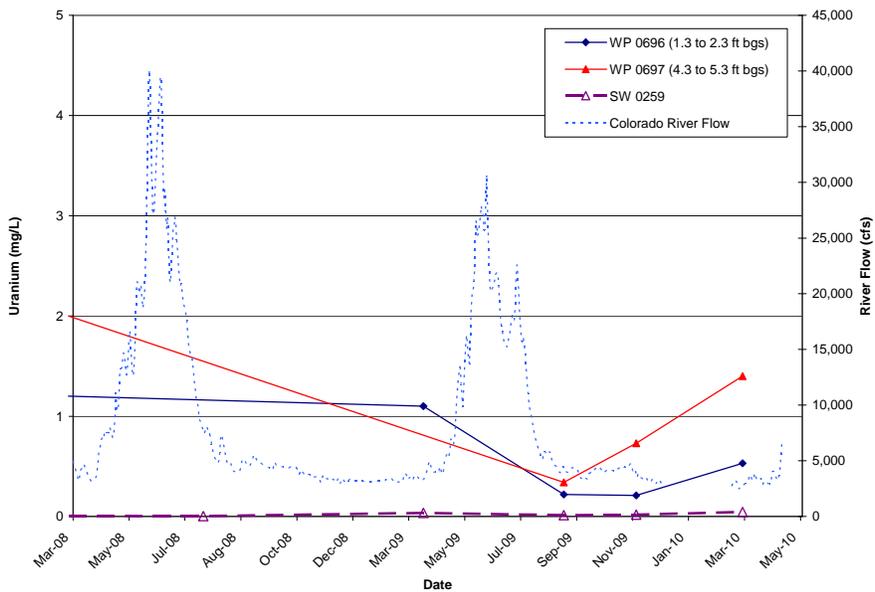


Figure 9. CF3 Surface Water Location 0259 and Wellpoints 0696 and 0697 Time Versus Uranium Concentration Plot

CF2

Figures 10, 11, and 12 provide the ammonia, TDS, and uranium concentrations (respectively) measured in well points 0615, 0616, and 0605, which are located 130 feet off the bank (near the river's edge), and adjacent to surface water location 0259. Starting with this area of the river bed, there is an increase of the surface water ammonia and uranium concentrations in response to the increase in the ground water concentrations.

CF1

The only surface water present in the vicinity of the river bed off CF1 was in the form of very small isolated pools that were less than 1 inch deep because of the low river stage. As a result, surface water samples were not collected during this sampling event in the vicinity of CF1.

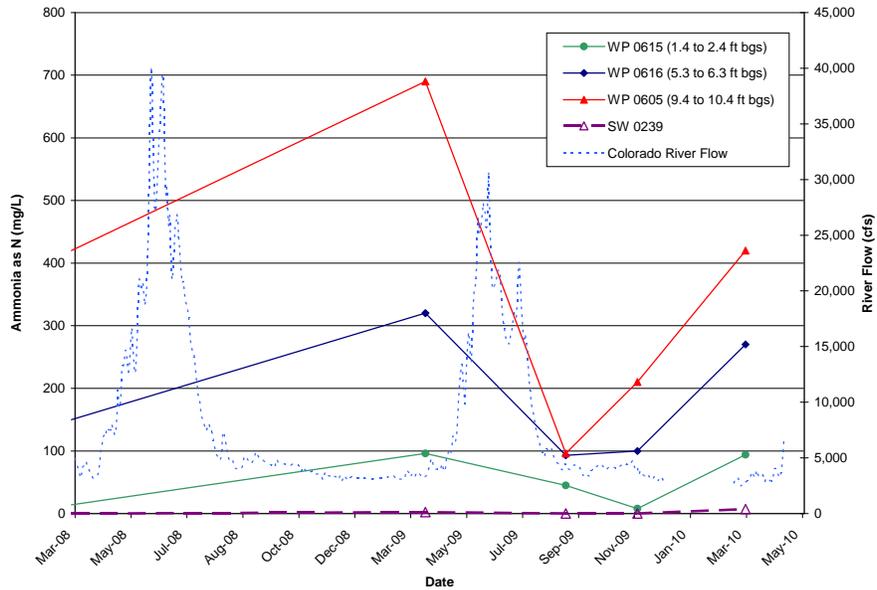


Figure 10. CF2 Surface Water Location 0239 and Wellpoints 0615, 0616, and 0605 Time Versus Ammonia Total (as N) Concentration Plot

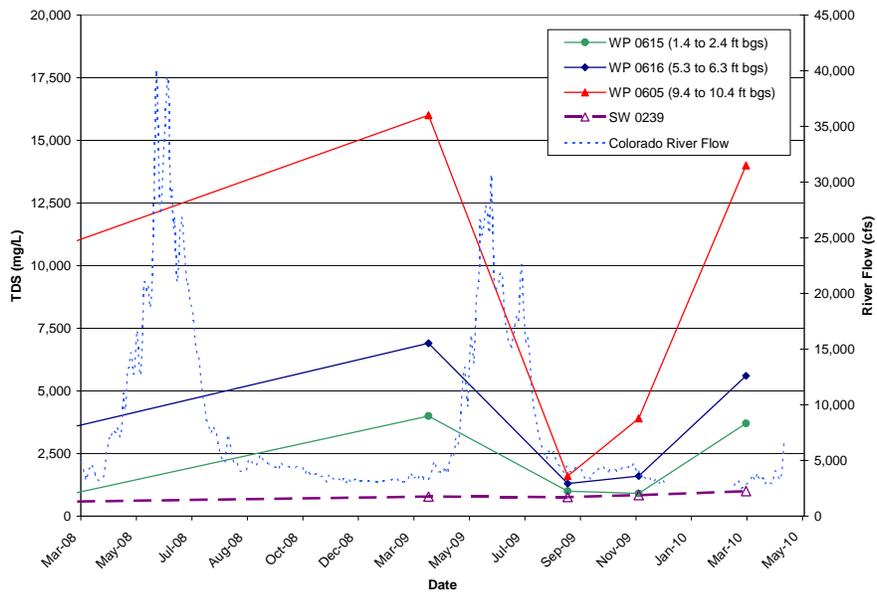


Figure 11. CF2 Surface Water Location 0239 and Wellpoints 0615, 0616, and 0605 Time Versus TDS Concentration Plot

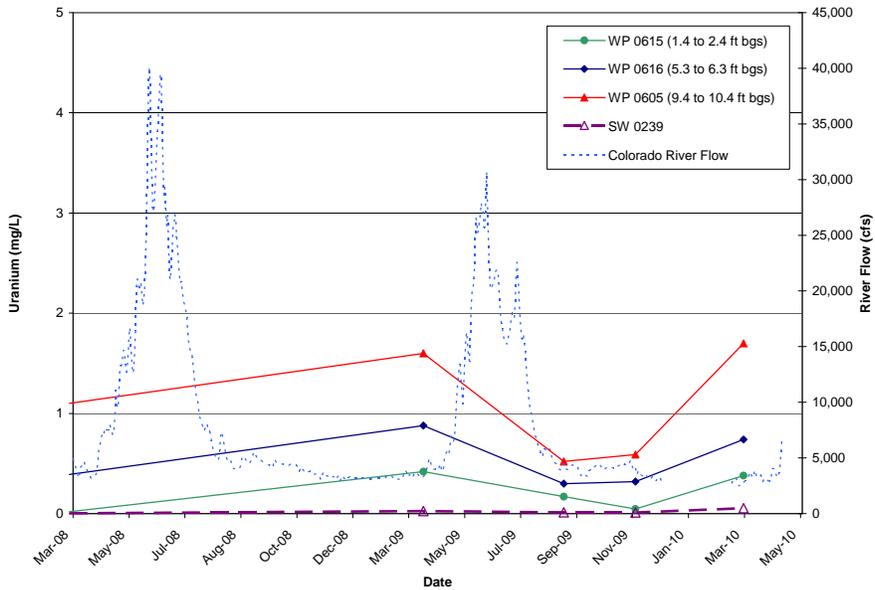


Figure 12. CF2 Surface Water Location 0239 and Wellpoints 0615, 0616, and 0605 Time Versus Uranium Concentration Plot

CF4

Figures 13, 14, and 15 provide the ammonia, TDS, and uranium concentrations (respectively) measured in well points 0790, 0791, and 0792, which are located directly off the bank and adjacent to surface water location 0274. As exhibited in these plots, the top 10 feet of the river bed appears to be very conductive, and the ground water readily discharges into the side channel located off CF4 under these low river stage conditions.

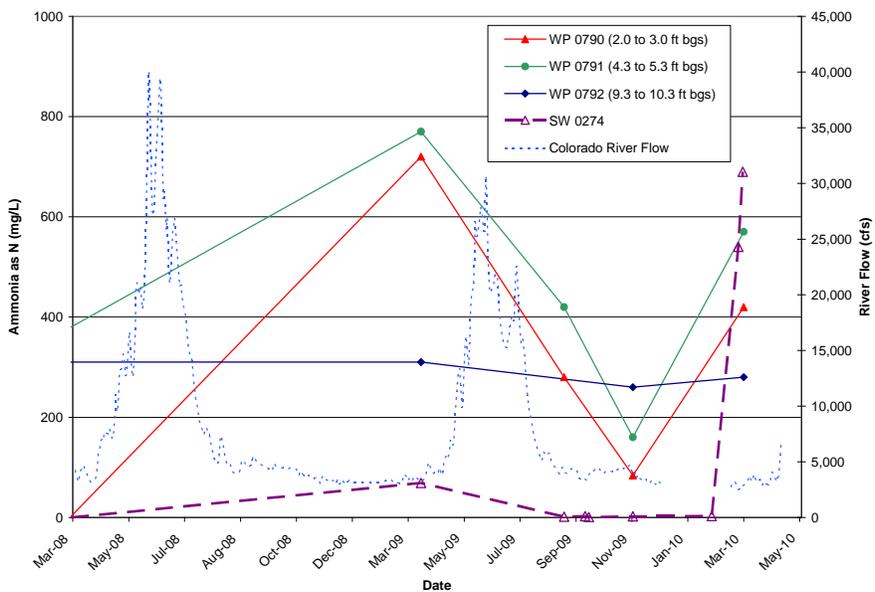


Figure 13. CF1 Surface Water Location 0274 and Wellpoints 0790, 0791, and 0792 Time Versus Ammonia Total (as N) Concentration Plot

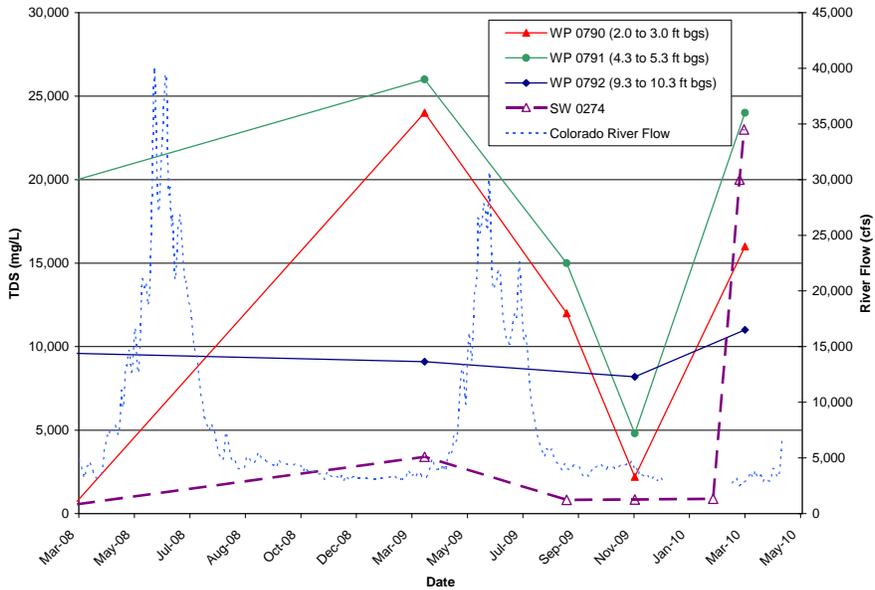


Figure 14. CF1 Surface Water Location 0274 and Wellpoints 0790, 0791, and 0792 Time Versus TDS Concentration Plot

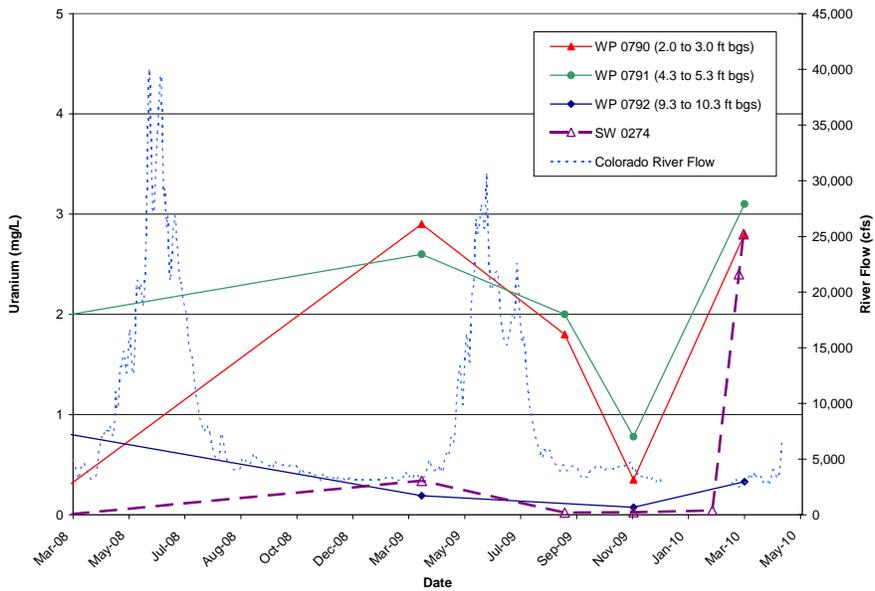


Figure 15. CF1 Surface Water Location 0274 and Wellpoints 0790, 0791, and 0792 Time Versus Uranium Concentration Plot

Surface Water Sampling Results

Ten surface water samples were collected as part of this sampling event (duplicates were collected from locations 0239 and 0279), with ammonia results provided in Table 1. The highest ammonia concentration measured between the sample and the duplicate are reported. For comparison purposes, the applicable 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. March 2010 Sampling Event Surface Water
Ammonia Concentrations and Comparisons to Utah and Federal Criteria*

Location	Date	Temp (°C)	pH	Ammonia Total as N (mg/L)	State/Federal AWQC-Acute Total as N (mg/L) ¹	State/Federal AWQC-Chronic Total as N (mg/L) ²
0239	3/2/10	4.8	8.3	7.2	3.15	1.52
0243	3/1/10	6.5	8.5	1.2	2.14	1.09
0259	3/1/10	10.6	8.4	4.6	2.59	1.29
0274	2/25/10	17.5	7.0	540	24.1	4.72
0274	3/2/10	18.2	7.0	690	24.1	4.72
0277	3/2/10	15.0	7.7	200	9.65	3.25
0278	3/2/10	13.7	7.3	240	17.5	5.08
0279	3/2/10	18.9	7.7	71	9.65	2.86

Temp = temperature, AWQC = ambient water quality criteria

Notes:

- (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, with the exception of the sample collected from location 0243, each of the samples exceeded both the acute and chronic Utah criteria for ammonia. The 0243 sample was below the acute criterion, but slightly above the chronic criterion. All samples were collected in shallow bodies of surface water, which were stagnant (or nearly stagnant) and did not meet the definition of a habitat area. In particular, the samples collected off CF4 (0274 through 0279) were collected for information purposes only, as a ground water seep was exposed during the low river stage in this area.

Table 2 presents the uranium results from the surface water samples. As shown in this table, all except the sample collected from location 0243 exceeded the Uranium Mill Tailings Radiation control Act (UMTRCA) Drinking Water Standard of 0.044 milligrams per liter (mg/L).

*Table 2. March 2010 Sampling Event Surface Water
Uranium Concentrations and Comparisons
to the UMTRCA Drinking Water Standard*

Location	Date	Uranium (mg/L)	UMTRCA Drinking Water Standard for Uranium (mg/L) ¹
0239	3/2/10	0.054	0.044
0243	3/1/10	0.038	
0259	3/1/10	0.045	
0274	2/25/10	2.4	
0274	3/2/10	2.8	
0277	3/2/10	0.81	
0278	3/2/10	1.3	
0279	3/2/10	0.39	

Note:

- (1) The maximum concentration limit in the EPA Ground Water Standards (40 CFR 192) for uranium is 30 picocuries per liter, which is equal to 0.044 mg/L assuming U-234 and U-238 are in equilibrium.

To clarify, despite the fact that water was present in the side channels during the March 2010 sampling event, these surface water bodies did not meet the definition of a habitat area (in some cases they were isolated pools, and in others the surface water bodies were too shallow). In addition, no fish were observed during the sampling of the surface water locations containing elevated ammonia and uranium concentrations.

Fresh water injection in CFs 1 through 4 in combination with ground water extraction closer to the toe of the tailings pile will provide the most effective means for preventing further contaminant concentration increases in this area of the river bed. Prior to this sampling event, it was not possible to extract ground water from the well field or the new CF5 wells because the discharge line (that transports extracted ground water from the well field to the evaporation pond) was disconnected because of the off-pile soil remediation activities.

The data associated with this event, in particular the samples collected from CF4 surface water locations 0274, 0277, 0278, and 0279 provide insight into the location and extent of the ground water discharge responsible for the surface water contaminant elevated concentrations. Based on this information, we will be able to avoid further occurrences.

1.3 Sampling and Analyses

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 (DOE-EM/GJ1220). Although not listed here, the normal set of locations were sampled. Please refer to the attached trip report (Attachment 1) 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 duplicates were collected, and because all samples were collected using dedicated equipment, it was not necessary to collect any equipment blanks (EBs) during this event. All samples were analyzed within their prescribed holding times. No significant discrepancies were noted regarding chain of custody (COC), case narratives, presence of field and sample identifications, preservation, and cooler receipts, except as qualified or noted in the Laboratory Performance Assessment (Section 2.2).

There were six locations (0239, 0274, 0564, 0565, 0611, and 0612) with a total of 19 analytical results (a duplicate was collected from 0239) that were considered anomalously high based on the Minimums and Maximums Report. See Section 3.2 for further discussion of these locations and data points.

According to the USGS Cisco gauging station, the mean daily Colorado River flow rates varied between 2,460 and 2,950 cubic feet per second (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 Assessment (Section 2.2), the Field Analyses/Activities (Section 2.3), and Certification (Section 2.4).

2.1 Water Sampling Field Activities Verification

The field activities verification process for this sampling event was documented using the checklist in Appendix A. As the checklist exhibits, all sampling was conducted following the applicable procedures. Please see Appendix A for the field activities verification checklist.

2.2 Laboratory Performance Assessment

General Information

Requisition No. (RIN): 1003042
 Sample Event: March 2010 IA Well Field Monthly Sampling
 Site(s): Moab, Utah
 Laboratory: ALS Laboratory Group, Fort Collins, Colorado
 Sample Data Group (SDG) No.: 1003027, 1003053, and 1003091
 Analysis: Metals, Inorganics, Isotopic Uranium, Polonium-210, and Lead-210
 Validator: Rachel Cowan
 Review Date: May 19, 2010

This validation was performed according to the *Environmental Procedures Catalog* (STO 6), “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 a review of the COC, case narratives, field and sample identifications, holding times, preservation, and cooler receipt. 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 3.

Table 3. Analytes and Methods

Analyte	Line Item Code	Preparation Method	Analytical Method
Ammonia as N, NH ₃ -N	WCH-A-005	EPA 350.1	EPA 350.1
Isotopic Uranium	ASP-A-024	SOP776R11 and SOP778R13	SOP714R12
Lead-210	LSC-A-019	SOP726R6	SOP704R9
Manganese	G17	SW-846 3005A	SW-846 6010B
Polonium-210	ASP-A-018	PA SOP711R7	PA SOP714R12
Selenium	G14	SW-846 3005A	SW-846 6020A
Total Dissolved Solids	WIC-A-033	EPA 160.1	EPA 160.1
Uranium	G1	SW-846 3005A	SW-846 6020A

Data Qualifier Summary

Analytical results were qualified as listed in Table 4. Refer to Table 5 for an explanation of the data qualifiers applied.

Table 4. Data Qualifiers

Sample Number	Location	Analyte	Flag	Reason
1003027-5 through -9; 1003053-6 through -9; 1003091-3 through -9	0591,0597, 0598,0599,0617; 0603, 0605, 0606, 0608; 0278, 0279, 0438,0439, 0441, 0453, 0454	Ammonia	J	MS1
1003091-5	0438	Lead-210	J	RQ5
1003091-6 through -9	0439, 0441, 0453, 0454	Lead-210	U	RQ3, RQ4
1003053-2, -8; 1003091-8, -14	0496, 0606; 0453, 0792	Selenium	J	LCS1, MS1, RS1, SD1
1003027-3	0274	TDS	J	HT2

J indicates estimated results; UJ indicates analytical results below detection limit

Table 5. Reason Codes for Data Flags

Reason Code	Qualifier (Detects)	Qualifier (Nondetects)	Explanation
HT2	J	UJ	Samples that were analyzed after their holding time had expired but were within two times their specified holding time.
LCS1	J	UJ	A Laboratory Control Sample was not analyzed.
MS1	J	UJ	Results for the affected analyte(s) are regarded as estimated (J) because the matrix spike 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.
RQ3	J	U	The radiochemical result is less than the uncertainty (two-sigma total-propagated uncertainty).
RQ4	J	U	The radiochemical result is less than the minimum detectable concentration.
RQ5	J	U	The radiochemical result is greater than the minimum detectable concentration but less than three times the minimum detectable concentration.
RS1	J	UJ	Replicate sample frequency criteria were not met.
SD1	J	NA	Serial dilution sample frequency criteria were not met.

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received a total of 46 samples for RIN 1003042 in three shipments, which arrived on March 3, 2010 (SDG 1003027; UPS tracking number 1Z5W1Y510193846697), March 4 (SDG 1003053; UPS tracking number 1Z5W1Y510195306105), and March 8, 2010 (SDG 1003091; UPS tracking number 1Z5W1Y510196019727). Each of the sample groups was accompanied by a COC form. The COC form was checked to confirm that all of the samples were listed on the 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

All SDGs were received intact and at appropriate temperatures (SDG 1003027 at 1.4 degrees centigrade [°C], SDG 1003053 at 0.6°C, and SDG 1003091 in two coolers at 2.6 and 3.2°C, respectively). 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 except for one TDS sample (1003027-3; location 0274) that was prepared within the specified hold time but analyzed one day after the hold time expired. This sample was qualified with a “J” for reason HT2.

Case Narratives

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

Radiochemical Quantification

In addition to laboratory instrument calibration standards, radiochemical analyses have required quantification standards. All radiochemical results reported are to include the calculated two-sigma total propagated uncertainty (TPU) and minimum detectable concentration (MDC) as quantification standards. Radiochemical results are qualified with a “J” flag (estimated) when the result is greater than the MDC, but less than three times the MDC. Radiochemical results are qualified with a “U” flag (not detected) when the result is less than the TPU and/or the MDC.

Lead-210 (Pb-210)

Some Pb-210 results did not meet quantification standards and are flagged accordingly (samples 1003091-5 (flagged with “J”) and samples 1003091-6 through -9 (all flagged with “U”).

Matrix Spike and Replicate Analysis

Matrix spike (MS) sample analysis, performed at a frequency of one per 20 samples unless otherwise noted, is a measure of the ability to recover analytes in a particular matrix. Replicate sample (RS) 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 RSs are indicators of laboratory precision for each sample matrix.

Method EPA 350.1, Ammonia

The ammonia samples in all the SDGs did not have the appropriate number of MS samples as per method requirements, so ammonia results from samples 1003027-5 through -9, 1003053-6 through -9, and 1003091-3 through -9 were J-flagged for MS1.

Method SW-846 6020A, Selenium

There were no selenium samples from SDGs 1003053 and 1003091 selected for testing matrix-specific quality-control samples. Therefore, there were no MSs for selenium, and the selenium results for SDGs 1003053 and 1003091 were flagged for MS1. Since there were also no selenium MSDs and no field duplicate selenium samples, these selenium results were also flagged for RS1.

Laboratory Control Sample

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 exceptions.

LCSs were not reported for manganese or uranium. As a standard practice, ALS Laboratory Group 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 samples are “J”-qualified for LCS failure.

The manganese and uranium MS results were acceptable, so no manganese and uranium results were flagged for reason LCS1. However, as there were no selenium samples from SDGs 1003053 and 1003091 selected for testing matrix-specific quality-control samples, no selenium LCS was prepared, and the selenium results from these SDGs were flagged for LCS1.

Method and Calibration Blanks

Method blanks (MBs) are analyzed to assess any contamination that may have occurred during sample preparation. Initial calibration blanks and continuing 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 or instrument detection limit (depending on method requirements) were “J”-qualified when the detections were less than five times the associated blank concentration. Nondetects were not qualified. According to the case narratives, all MBs passed requirements, so no results were flagged for this reason.

Metals Serial Dilution

Serial dilution (SD) samples were prepared and analyzed for the metals analyses to monitor chemical or physical interferences in the sample matrix. Inductively coupled plasma (ICP)-mass spectrometry SD data are evaluated when the concentration of the undiluted sample is greater than 100 times the reporting limit (RL). ICP-atomic emission spectroscopy SD data are evaluated when the concentration of the undiluted sample is greater than 50 times the RL. All evaluated SD data were acceptable with the following exceptions.

According to the case narratives, there were no selenium SD samples in SDGs 1003053 and 1003091, so all selenium results in these SDGs were flagged for SD1.

Field Duplicate Analysis

Field duplicate samples are collected and analyzed as an indication of overall precision of the measurement process. The precision observed includes both field and laboratory precision and has more variability than laboratory replicates, which measure only laboratory performance. Two duplicate samples were collected from surface water locations 0239 (1003053-1), 0279 (1003091-1), and 0453 (1003091-8) in the March 2010 sampling event. The duplicate results met the U.S. Environmental Protection Agency (EPA)-recommended laboratory duplicate criteria of less than 20 relative percent difference (RPD) for results that are greater than five times the reporting level.

Equipment Blanks

An EB is a sample of analyte-free media collected from a rinse of nondedicated sampling equipment 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 the ground water and surface water samples were collected using dedicated equipment. As per procedure, no EBs needed to be collected.

Completeness

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

Electronic Data Deliverable File

All Electronic Data Deliverable (EDD) files arrived on March 31, 2010 (SDGs 1003027, 1003053, and 1003091). The contents of the EDD files were manually examined to verify that the sample results accurately reflected the data contained in the SDGs and that all and only the requested data were delivered.

2.3 Field Analyses/Activities

The following information summarizes the field analyses and activities for the March 2010 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. Three duplicate samples were 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 criteria of ± 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 RLs were met. 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 Report (Section 3.1), the Anomalous Data Review (Section 3.2), tables containing the Water Quality and Water Level Data (Sections 3.3 and 3.4, respectively), and the Blanks Report (Section 3.5).

3.1 Minimums and Maximums Report

The Minimums and Maximums Report (see Appendix B) is 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 less or more than 50 percent of historical minimum or maximum values; or (3) there were fewer than five historical samples for comparison.

3.2 Anomalous Data Review

There were five anomalous data from four different locations (a duplicate was collected from 0259, which had anomalously high manganese in both samples) associated with this sampling event based on the Minimums and Maximums Report.

Loc. No.	Analyte	Type of Anomaly	Disposition
0239	ammonia	high	Low river flows resulted in ground water discharge into surface water
0239	manganese	high	Low river flows resulted in ground water discharge into surface water
0239	uranium	high	Low river flows resulted in ground water discharge into surface water
0274	ammonia	high	Low river flows resulted in ground water discharge into surface water
0274	manganese	high	Low river flows resulted in ground water discharge into surface water
0274	TDS	high	Low river flows resulted in ground water discharge into surface water
0274	uranium	high	Low river flows resulted in ground water discharge into surface water
0564	manganese	high	Low river flows resulted in ground water discharge into surface water
0565	manganese	high	Low river flows resulted in ground water discharge into surface water
0565	TDS	high	Low river flows resulted in ground water discharge into surface water
0565	uranium	high	Low river flows resulted in ground water discharge into surface water
0611	ammonia	high	Low river flows resulted in ground water discharge into surface water
0611	TDS	high	Low river flows resulted in ground water discharge into surface water
0611	uranium	high	Low river flows resulted in ground water discharge into surface water
0612	manganese	high	Low river flows resulted in ground water discharge into surface water
0612	uranium	high	Low river flows resulted in ground water discharge into surface water

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 Report

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

Appendix A.
Water Sampling Field Activities Verification

Appendix A. Water Sampling Field Activities Verification (continued)

Sampling Event / RIN	<u>March 2010/RIN 1003042</u>	Date(s) of Water Sampling	<u>February 25 to March 4, 2009</u>
Date(s) of Verification	<u>May 19, 2010</u>	Name of Verifier	<u>Rachel Cowan</u>

	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?	Yes	
3. Was a pre-trip 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	
	NA	
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	There were 46 samples, and three duplicates were collected.
10. Were EBs taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	NA	All samples collected using dedicated equipment.

Appendix A. Water Sampling Field Activities Verification (continued)

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 Report

Appendix B. Minimums and Maximums Report

Data Validation Minimums and Maximums Report - No Field Parameters

Laboratory: PARAGON (Fort Collins, CO)

RIN: 1003042

Comparison: All Historical Data

Report Date: 5/11/2010

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	0239	03/02/2010	Ammonia Total as N	6.3		2.4		J	0.043	J	U	23	9
MOA01	0239	03/02/2010	Ammonia Total as N	7.2		2.4		J	0.043	J	U	23	9
MOA01	0239	03/02/2010	Manganese	0.2		0.04			0.004	B		14	2
MOA01	0239	03/02/2010	Manganese	0.21		0.04			0.004	B		14	2
MOA01	0239	03/02/2010	Total Dissolved Solids	1000		930			420			23	0
MOA01	0239	03/02/2010	Total Dissolved Solids	1100		930			420			23	0
MOA01	0239	03/02/2010	Uranium	0.054		0.025		J	0.0034		J	23	0
MOA01	0239	03/02/2010	Uranium	0.051		0.025		J	0.0034		J	23	0
MOA01	0259	03/01/2010	Ammonia Total as N	4.6		4		J	0.067	J	U	26	13
MOA01	0259	03/01/2010	Manganese	0.086		0.073			0.0019	B		17	1
MOA01	0259	03/01/2010	Total Dissolved Solids	1000		970			410			26	0
MOA01	0259	03/01/2010	Uranium	0.045		0.035			0.0033		J	26	1
MOA01	0274	03/02/2010	Ammonia Total as N	690		540			0.074	J	U	23	5
MOA01	0274	02/25/2010	Ammonia Total as N	540		69		J	0.074	J	U	22	5
MOA01	0274	02/25/2010	Manganese	4.1		0.83			0.0025	B	J	16	3
MOA01	0274	03/02/2010	Manganese	5.7		4.1			0.0025	B	J	17	3
MOA01	0274	02/25/2010	Total Dissolved Solids	20000	J	3400		J	330			20	0

Appendix B. Minimums and Maximums Report (continued)

Data Validation Minimums and Maximums Report - No Field Parameters

Laboratory: PARAGON (Fort Collins, CO)

RIN: 1003042

Comparison: All Historical Data

Report Date: 5/11/2010

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	0274	03/02/2010	Total Dissolved Solids	23000		20000	J	330		21	0		
MOA01	0274	03/02/2010	Uranium	2.8		2.4		0.0023	J	21	1		
MOA01	0274	02/25/2010	Uranium	2.4		0.34		0.0023	J	20	1		
MOA01	0563	03/02/2010	Uranium	1.2		0.85	FQ	0.014	QF	33	0		
MOA01	0564	03/02/2010	Manganese	1.4		0.81		0.3		7	0		
MOA01	0564	03/02/2010	Total Dissolved Solids	1200		830	QF	497	H QF	20	0		
MOA01	0565	03/02/2010	Manganese	2.1		1.1		0.313	E QFJ	10	0		
MOA01	0565	03/02/2010	Total Dissolved Solids	3800		2000	FQ	427	QF	21	0		
MOA01	0565	03/02/2010	Uranium	0.34		0.0235	FQ	0.00021	UFQ	17	1		
MOA01	0598	03/01/2010	Selenium	0.0069		0.089	F	0.0076	J	16	0		
MOA01	0599	03/01/2010	Selenium	0.0097		0.158	QF	0.01	J	9	0		
MOA01	0603	03/01/2010	Uranium	2		1.9		0.0108	FQ	22	0		
MOA01	0605	03/02/2010	Manganese	2		1.8	J	0.0454	E QF	9	0		
MOA01	0605	03/02/2010	Uranium	1.7		1.6	J	0.17	QF	16	0		
MOA01	0611	03/02/2010	Ammonia Total as N	38		9.6		0.63		15	0		
MOA01	0611	03/02/2010	Manganese	3.3		2.95	N FQ	0.847	F	10	0		
MOA01	0611	03/02/2010	Total Dissolved Solids	4600		1700	J	502	F	15	0		

Appendix B. Minimums and Maximums Report (continued)

Data Validation Minimums and Maximums Report - No Field Parameters

Laboratory: PARAGON (Fort Collins, CO)

RIN: 1003042

Comparison: All Historical Data

Report Date: 5/11/2010

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	0611	03/02/2010	Uranium	0.37		0.048	J	0.000019	B	J	15	0	
MOA01	0612	03/02/2010	Ammonia Total as N	76		69	J	0.427		QF	16	0	
MOA01	0612	03/02/2010	Manganese	3.5		1.6	J	0.439		F	10	0	
MOA01	0612	03/02/2010	Total Dissolved Solids	5500		3800	J	479		F	16	0	
MOA01	0612	03/02/2010	Uranium	0.83		0.36	J	0.0000059	U	J	16	1	
MOA01	0690	03/01/2010	Manganese	1.2		10	J	1.6		J	11	0	
MOA01	0691	03/01/2010	Manganese	4.8		4.1		0.84			20	0	
MOA01	0696	03/01/2010	Manganese	2.7		2.6		0.25			9	0	
MOA01	0697	03/01/2010	Selenium	0.0047		0.16	QF	0.0068		J	7	0	
MOA01	0791	03/03/2010	Uranium	3.1		2.7	FQ	0.017		J	18	0	
MOA01	0793	03/03/2010	Ammonia Total as N	0.1	U	0.44	QF	0.18		J	6	0	
MOA01	0793	03/03/2010	Manganese	0.73		1.57	QF	0.81			5	0	
MOA01	0793	03/03/2010	Uranium	0.015		0.0138	F	0.0063		J	6	0	

Analyte concentrations presented in blue text represent the historical value exceeded by the concentration presented in red, which is associated with this current sampling event.

Appendix B. Minimums and Maximums Report (continued)

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

LAB QUALIFIERS:

- * Replicate analysis not within control limits.
- > Result above upper detection limit.
- A Tentatively identified compound is a suspected aldol-condensation product.
- B Inorganic: Result is between the instrument detection limit and the contract-required detection limit. Organic: Analyte also found in MB.
- 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: Tentatively identified compound.
- P > 25% difference in detected pesticide or Aroclor concentrations between two columns.
- U Analytical result below detection limit.
- W Post-digestion 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. | 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. | | |

Appendix C.
Water Quality Data

Appendix C. Water Quality Data

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 5/11/2010

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	0239	SL	03/02/2010	0001	0.25	-	0.25	7.2			#	0.5	
Ammonia Total as N	mg/L	0239	SL	03/02/2010	0002	0	-	0	6.3			#	0.2	
Ammonia Total as N	mg/L	0243	SL	03/01/2010	0001	0.33	-	0.33	1.2			#	0.1	
Ammonia Total as N	mg/L	0259	SL	03/01/2010	0001	0.17	-	0.17	4.6			#	0.1	
Ammonia Total as N	mg/L	0274	SL	02/25/2010	0001	0.25	-	0.25	540			#	20	
Ammonia Total as N	mg/L	0274	SL	03/02/2010	0001	0.25	-	0.25	690			#	20	
Ammonia Total as N	mg/L	0277	SL	03/02/2010	0001	0.17	-	0.17	200			#	10	
Ammonia Total as N	mg/L	0278	SL	03/02/2010	0001	0.13	-	0.13	240		J	#	10	
Ammonia Total as N	mg/L	0279	SL	03/02/2010	0001	0.17	-	0.17	71		J	#	10	
Ammonia Total as N	mg/L	0279	SL	03/02/2010	0002	0	-	0	63			#	10	
Ammonia Total as N	mg/L	0441	WL	03/03/2010	0001	53	-	53	0.1	U	J	#	0.1	
Ammonia Total as N	mg/L	0453	WL	03/04/2010	0001	77	-	77	490		J	#	10	
Ammonia Total as N	mg/L	0453	WL	03/04/2010	0002	0	-	0	550			#	20	
Ammonia Total as N	mg/L	0495	WL	03/01/2010	0001	4.6	-	5.6	29			#	1	
Ammonia Total as N	mg/L	0496	WL	03/01/2010	0001	2.2	-	3.2	130			#	10	
Ammonia Total as N	mg/L	0562	WL	03/02/2010	0001	1.3	-	2.3	83			#	10	
Ammonia Total as N	mg/L	0563	WL	03/02/2010	0001	4.6	-	5.6	210			#	10	
Ammonia Total as N	mg/L	0564	WL	03/02/2010	0001	1.2	-	2.2	0.32			#	0.1	
Ammonia Total as N	mg/L	0565	WL	03/02/2010	0001	4	-	5	2.6			#	0.1	
Ammonia Total as N	mg/L	0590	WL	03/01/2010	0001	1	-	2	27			#	1	
Ammonia Total as N	mg/L	0591	WL	03/01/2010	0001	3.9	-	4.9	130		J	#	5	
Ammonia Total as N	mg/L	0597	WL	03/01/2010	0001	9.3	-	10.3	200		J	#	5	
Ammonia Total as N	mg/L	0598	WL	03/01/2010	0001	9.1	-	10.1	230		J	#	5	
Ammonia Total as N	mg/L	0599	WL	03/01/2010	0001	9.4	-	10.4	310		J	#	10	
Ammonia Total as N	mg/L	0603	WL	03/01/2010	0001	9.2	-	10.2	320		J	#	10	
Ammonia Total as N	mg/L	0605	WL	03/02/2010	0001	9.4	-	10.4	420		J	#	10	
Ammonia Total as N	mg/L	0606	WL	03/02/2010	0001	9.3	-	10.3	400			#	10	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 5/11/2010

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit	Uncertainty
								Lab	Data QA		
Ammonia Total as N	mg/L	0608	WL	03/02/2010	0001	8.9 - 9.9	310		J #	10	
Ammonia Total as N	mg/L	0611	WL	03/02/2010	0001	2.2 - 3.2	38		#	1	
Ammonia Total as N	mg/L	0612	WL	03/02/2010	0001	4.3 - 5.3	76		#	10	
Ammonia Total as N	mg/L	0615	WL	03/02/2010	0001	1.4 - 2.4	94		#	10	
Ammonia Total as N	mg/L	0616	WL	03/02/2010	0001	5.3 - 6.3	270		#	10	
Ammonia Total as N	mg/L	0617	WL	03/01/2010	0001	1.7 - 2.7	160		J #	5	
Ammonia Total as N	mg/L	0618	WL	03/01/2010	0001	5.3 - 6.3	200		#	5	
Ammonia Total as N	mg/L	0690	WL	03/01/2010	0001	3.3 - 4.3	0.1	U	#	0.1	
Ammonia Total as N	mg/L	0691	WL	03/01/2010	0001	6.5 - 7.5	160		#	5	
Ammonia Total as N	mg/L	0692	WL	03/01/2010	0001	9.7 - 10.1	280		#	10	
Ammonia Total as N	mg/L	0696	WL	03/01/2010	0001	1.3 - 2.3	110		#	5	
Ammonia Total as N	mg/L	0697	WL	03/01/2010	0001	4.3 - 5.3	370		#	10	
Ammonia Total as N	mg/L	0790	WL	03/03/2010	0001	2 - 3	420		#	10	
Ammonia Total as N	mg/L	0791	WL	03/03/2010	0001	4.3 - 5.3	570		#	20	
Ammonia Total as N	mg/L	0792	WL	03/03/2010	0001	9.3 - 10.3	280		#	10	
Ammonia Total as N	mg/L	0793	WL	03/03/2010	0001	2 - 3	0.1	U	#	0.1	
Dissolved Oxygen	mg/L	0239	SL	03/02/2010	0001	0.25 - 0.25	13.67		#		
Dissolved Oxygen	mg/L	0243	SL	03/01/2010	0001	0.33 - 0.33	12.04		#		
Dissolved Oxygen	mg/L	0259	SL	03/01/2010	0001	0.17 - 0.17	11.58		#		
Dissolved Oxygen	mg/L	0274	SL	02/25/2010	0001	0.25 - 0.25	17.07		#		
Dissolved Oxygen	mg/L	0274	SL	03/02/2010	0001	0.25 - 0.25	9.93		#		
Dissolved Oxygen	mg/L	0277	SL	03/02/2010	0001	0.17 - 0.17	11.72		#		
Dissolved Oxygen	mg/L	0278	SL	03/02/2010	0001	0.13 - 0.13	7.94		#		
Dissolved Oxygen	mg/L	0279	SL	03/02/2010	0001	0.17 - 0.17	11.8		#		
Dissolved Oxygen	mg/L	0438	WL	03/04/2010	0001	118 - 118	0.8		#		
Dissolved Oxygen	mg/L	0439	WL	03/04/2010	0001	118 - 118	0.59		#		
Dissolved Oxygen	mg/L	0441	WL	03/03/2010	0001	53 - 53	0.85		#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 5/11/2010

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	0453	WL	03/04/2010	0001	77	- 77	0.5		#		
Dissolved Oxygen	mg/L	0454	WL	03/03/2010	0001	13	- 13	1.66		#		
Dissolved Oxygen	mg/L	0495	WL	03/01/2010	0001	4.6	- 5.6	7.45		#		
Dissolved Oxygen	mg/L	0496	WL	03/01/2010	0001	2.2	- 3.2	8.87		#		
Dissolved Oxygen	mg/L	0562	WL	03/02/2010	0001	1.3	- 2.3	4.79		#		
Dissolved Oxygen	mg/L	0563	WL	03/02/2010	0001	4.6	- 5.6	4.03		#		
Dissolved Oxygen	mg/L	0564	WL	03/02/2010	0001	1.2	- 2.2	4.94		#		
Dissolved Oxygen	mg/L	0565	WL	03/02/2010	0001	4	- 5	3.86		#		
Dissolved Oxygen	mg/L	0590	WL	03/01/2010	0001	1	- 2	9.56		#		
Dissolved Oxygen	mg/L	0591	WL	03/01/2010	0001	3.9	- 4.9	1.49		#		
Dissolved Oxygen	mg/L	0597	WL	03/01/2010	0001	9.3	- 10.3	2.46		#		
Dissolved Oxygen	mg/L	0598	WL	03/01/2010	0001	9.1	- 10.1	1.1		#		
Dissolved Oxygen	mg/L	0599	WL	03/01/2010	0001	9.4	- 10.4	2.17		#		
Dissolved Oxygen	mg/L	0603	WL	03/01/2010	0001	9.2	- 10.2	0.8		#		
Dissolved Oxygen	mg/L	0605	WL	03/02/2010	0001	9.4	- 10.4	2.9		#		
Dissolved Oxygen	mg/L	0606	WL	03/02/2010	0001	9.3	- 10.3	1.87		#		
Dissolved Oxygen	mg/L	0608	WL	03/02/2010	0001	8.9	- 9.9	2		#		
Dissolved Oxygen	mg/L	0611	WL	03/02/2010	0001	2.2	- 3.2	10.27		#		
Dissolved Oxygen	mg/L	0612	WL	03/02/2010	0001	4.3	- 5.3	2.51		#		
Dissolved Oxygen	mg/L	0615	WL	03/02/2010	0001	1.4	- 2.4	4.97		#		
Dissolved Oxygen	mg/L	0616	WL	03/02/2010	0001	5.3	- 6.3	2.22		#		
Dissolved Oxygen	mg/L	0617	WL	03/01/2010	0001	1.7	- 2.7	3.43		#		
Dissolved Oxygen	mg/L	0618	WL	03/01/2010	0001	5.3	- 6.3	2.66		#		
Dissolved Oxygen	mg/L	0690	WL	03/01/2010	0001	3.3	- 4.3	5.2		#		
Dissolved Oxygen	mg/L	0691	WL	03/01/2010	0001	6.5	- 7.5	3.41		#		
Dissolved Oxygen	mg/L	0692	WL	03/01/2010	0001	9.7	- 10.1	2.15		#		
Dissolved Oxygen	mg/L	0696	WL	03/01/2010	0001	1.3	- 2.3	1.73		#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 5/11/2010

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	0697	WL	03/01/2010	0001	4.3	-	5.3	8.62		#		
Dissolved Oxygen	mg/L	0790	WL	03/03/2010	0001	2	-	3	0.9		#		
Dissolved Oxygen	mg/L	0791	WL	03/03/2010	0001	4.3	-	5.3	2.79		#		
Dissolved Oxygen	mg/L	0792	WL	03/03/2010	0001	9.3	-	10.3	3.5		#		
Dissolved Oxygen	mg/L	0793	WL	03/03/2010	0001	2	-	3	5		#		
Lead-210	pCi/L	0438	WL	03/04/2010	0001	118	-	118	1.21		#	0.94	0.66
Lead-210	pCi/L	0439	WL	03/04/2010	0001	118	-	118	0.84	U	#	0.84	0.52
Lead-210	pCi/L	0441	WL	03/03/2010	0001	53	-	53	0.47	U	#	0.47	0.28
Lead-210	pCi/L	0453	WL	03/04/2010	0001	77	-	77	0.69	U	#	0.69	0.44
Lead-210	pCi/L	0454	WL	03/03/2010	0001	13	-	13	1.7	U,M	#	1.7	1.1
Manganese	mg/L	0239	SL	03/02/2010	0001	0.25	-	0.25	0.21		#	0.00057	
Manganese	mg/L	0239	SL	03/02/2010	0002	0	-	0	0.2		#	0.00011	
Manganese	mg/L	0243	SL	03/01/2010	0001	0.33	-	0.33	0.077		#	0.00011	
Manganese	mg/L	0259	SL	03/01/2010	0001	0.17	-	0.17	0.086		#	0.00011	
Manganese	mg/L	0274	SL	02/25/2010	0001	0.25	-	0.25	4.1		#	0.00011	
Manganese	mg/L	0274	SL	03/02/2010	0001	0.25	-	0.25	5.7		#	0.0011	
Manganese	mg/L	0277	SL	03/02/2010	0001	0.17	-	0.17	1.6		#	0.00057	
Manganese	mg/L	0278	SL	03/02/2010	0001	0.13	-	0.13	3.3		#	0.00057	
Manganese	mg/L	0279	SL	03/02/2010	0001	0.17	-	0.17	0.66		#	0.00057	
Manganese	mg/L	0279	SL	03/02/2010	0002	0	-	0	0.82		#	0.00057	
Manganese	mg/L	0441	WL	03/03/2010	0001	53	-	53	1.3		#	0.00057	
Manganese	mg/L	0453	WL	03/04/2010	0001	77	-	77	0.59		#	0.0011	
Manganese	mg/L	0453	WL	03/04/2010	0002	0	-	0	0.49		#	0.0011	
Manganese	mg/L	0495	WL	03/01/2010	0001	4.6	-	5.6	1.3		#	0.00057	
Manganese	mg/L	0496	WL	03/01/2010	0001	2.2	-	3.2	1.7		#	0.00057	
Manganese	mg/L	0562	WL	03/02/2010	0001	1.3	-	2.3	3		#	0.00057	
Manganese	mg/L	0563	WL	03/02/2010	0001	4.6	-	5.6	1		#	0.00057	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 5/11/2010

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Lab	Data QA		
Manganese	mg/L	0564	WL	03/02/2010	0001	1.2	-	2.2	1.4		#	0.00011	
Manganese	mg/L	0565	WL	03/02/2010	0001	4	-	5	2.1		#	0.00057	
Manganese	mg/L	0590	WL	03/01/2010	0001	1	-	2	2.9		#	0.00057	
Manganese	mg/L	0591	WL	03/01/2010	0001	3.9	-	4.9	2.3		#	0.00057	
Manganese	mg/L	0597	WL	03/01/2010	0001	9.3	-	10.3	4.9		#	0.00057	
Manganese	mg/L	0598	WL	03/01/2010	0001	9.1	-	10.1	2.6		#	0.00057	
Manganese	mg/L	0599	WL	03/01/2010	0001	9.4	-	10.4	4.8		#	0.00057	
Manganese	mg/L	0603	WL	03/01/2010	0001	9.2	-	10.2	3		#	0.0011	
Manganese	mg/L	0605	WL	03/02/2010	0001	9.4	-	10.4	2		#	0.0011	
Manganese	mg/L	0606	WL	03/02/2010	0001	9.3	-	10.3	2		#	0.0011	
Manganese	mg/L	0608	WL	03/02/2010	0001	8.9	-	9.9	1.5		#	0.0011	
Manganese	mg/L	0611	WL	03/02/2010	0001	2.2	-	3.2	3.3		#	0.00057	
Manganese	mg/L	0612	WL	03/02/2010	0001	4.3	-	5.3	3.5		#	0.00057	
Manganese	mg/L	0615	WL	03/02/2010	0001	1.4	-	2.4	2.8		#	0.00057	
Manganese	mg/L	0616	WL	03/02/2010	0001	5.3	-	6.3	0.88		#	0.00057	
Manganese	mg/L	0617	WL	03/01/2010	0001	1.7	-	2.7	4.6		#	0.00057	
Manganese	mg/L	0618	WL	03/01/2010	0001	5.3	-	6.3	4.3		#	0.00057	
Manganese	mg/L	0690	WL	03/01/2010	0001	3.3	-	4.3	1.2		#	0.00057	
Manganese	mg/L	0691	WL	03/01/2010	0001	6.5	-	7.5	4.8		#	0.00057	
Manganese	mg/L	0692	WL	03/01/2010	0001	9.7	-	10.1	4.9		#	0.0011	
Manganese	mg/L	0696	WL	03/01/2010	0001	1.3	-	2.3	2.7		#	0.00057	
Manganese	mg/L	0697	WL	03/01/2010	0001	4.3	-	5.3	1.1		#	0.0011	
Manganese	mg/L	0790	WL	03/03/2010	0001	2	-	3	4.9		#	0.0011	
Manganese	mg/L	0791	WL	03/03/2010	0001	4.3	-	5.3	6.1		#	0.0011	
Manganese	mg/L	0792	WL	03/03/2010	0001	9.3	-	10.3	1.1		#	0.0011	
Manganese	mg/L	0793	WL	03/03/2010	0001	2	-	3	0.73		#	0.00011	
Oxidation Reduction Potential	mV	0239	SL	03/02/2010	0001	0.25	-	0.25	77		#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 5/11/2010

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	0243	SL	03/01/2010	0001	0.33	-	0.33	98		#		
Oxidation Reduction Potential	mV	0259	SL	03/01/2010	0001	0.17	-	0.17	110.7		#		
Oxidation Reduction Potential	mV	0274	SL	02/25/2010	0001	0.25	-	0.25	196		#		
Oxidation Reduction Potential	mV	0274	SL	03/02/2010	0001	0.25	-	0.25	157		#		
Oxidation Reduction Potential	mV	0277	SL	03/02/2010	0001	0.17	-	0.17	132		#		
Oxidation Reduction Potential	mV	0278	SL	03/02/2010	0001	0.13	-	0.13	153		#		
Oxidation Reduction Potential	mV	0279	SL	03/02/2010	0001	0.17	-	0.17	116		#		
Oxidation Reduction Potential	mV	0438	WL	03/04/2010	0001	118	-	118	104.9		#		
Oxidation Reduction Potential	mV	0439	WL	03/04/2010	0001	118	-	118	89.5		#		
Oxidation Reduction Potential	mV	0441	WL	03/03/2010	0001	53	-	53	11.8		#		
Oxidation Reduction Potential	mV	0453	WL	03/04/2010	0001	77	-	77	103		#		
Oxidation Reduction Potential	mV	0454	WL	03/03/2010	0001	13	-	13	6.15		#		
Oxidation Reduction Potential	mV	0495	WL	03/01/2010	0001	4.6	-	5.6	81		#		
Oxidation Reduction Potential	mV	0496	WL	03/01/2010	0001	2.2	-	3.2	126		#		
Oxidation Reduction Potential	mV	0562	WL	03/02/2010	0001	1.3	-	2.3	15		#		
Oxidation Reduction Potential	mV	0563	WL	03/02/2010	0001	4.6	-	5.6	-31		#		
Oxidation Reduction Potential	mV	0564	WL	03/02/2010	0001	1.2	-	2.2	-160		#		
Oxidation Reduction Potential	mV	0565	WL	03/02/2010	0001	4	-	5	-126		#		
Oxidation Reduction Potential	mV	0590	WL	03/01/2010	0001	1	-	2	7.5		#		
Oxidation Reduction Potential	mV	0591	WL	03/01/2010	0001	3.9	-	4.9	71.4		#		
Oxidation Reduction Potential	mV	0597	WL	03/01/2010	0001	9.3	-	10.3	121		#		
Oxidation Reduction Potential	mV	0598	WL	03/01/2010	0001	9.1	-	10.1	141		#		
Oxidation Reduction Potential	mV	0599	WL	03/01/2010	0001	9.4	-	10.4	86		#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 5/11/2010

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
										Lab	Data	QA		
Potential														
Oxidation Reduction Potential	mV	0603	WL	03/01/2010	0001	9.2	-	10.2	49.3			#		
Oxidation Reduction Potential	mV	0605	WL	03/02/2010	0001	9.4	-	10.4	-172			#		
Oxidation Reduction Potential	mV	0606	WL	03/02/2010	0001	9.3	-	10.3	-22			#		
Oxidation Reduction Potential	mV	0608	WL	03/02/2010	0001	8.9	-	9.9	-83			#		
Oxidation Reduction Potential	mV	0611	WL	03/02/2010	0001	2.2	-	3.2	-71			#		
Oxidation Reduction Potential	mV	0612	WL	03/02/2010	0001	4.3	-	5.3	-20			#		
Oxidation Reduction Potential	mV	0615	WL	03/02/2010	0001	1.4	-	2.4	-156			#		
Oxidation Reduction Potential	mV	0616	WL	03/02/2010	0001	5.3	-	6.3	-109			#		
Oxidation Reduction Potential	mV	0617	WL	03/01/2010	0001	1.7	-	2.7	163			#		
Oxidation Reduction Potential	mV	0618	WL	03/01/2010	0001	5.3	-	6.3	107			#		
Oxidation Reduction Potential	mV	0690	WL	03/01/2010	0001	3.3	-	4.3	-78			#		
Oxidation Reduction Potential	mV	0691	WL	03/01/2010	0001	6.5	-	7.5	-65			#		
Oxidation Reduction Potential	mV	0692	WL	03/01/2010	0001	9.7	-	10.1	-57			#		
Oxidation Reduction Potential	mV	0696	WL	03/01/2010	0001	1.3	-	2.3	132.9			#		
Oxidation Reduction Potential	mV	0697	WL	03/01/2010	0001	4.3	-	5.3	99.2			#		
Oxidation Reduction Potential	mV	0790	WL	03/03/2010	0001	2	-	3	205			#		
Oxidation Reduction Potential	mV	0791	WL	03/03/2010	0001	4.3	-	5.3	-55			#		
Oxidation Reduction Potential	mV	0792	WL	03/03/2010	0001	9.3	-	10.3	146			#		
Oxidation Reduction Potential	mV	0793	WL	03/03/2010	0001	2	-	3	-138			#		
pH	s.u.	0239	SL	03/02/2010	0001	0.25	-	0.25	8.31			#		
pH	s.u.	0243	SL	03/01/2010	0001	0.33	-	0.33	8.45			#		
pH	s.u.	0259	SL	03/01/2010	0001	0.17	-	0.17	8.4			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 5/11/2010

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Lab	Data QA		
pH	s.u.	0274	SL	02/25/2010	0001	0.25	-	0.25	7.02		#		
pH	s.u.	0274	SL	03/02/2010	0001	0.25	-	0.25	7.02		#		
pH	s.u.	0277	SL	03/02/2010	0001	0.17	-	0.17	7.71		#		
pH	s.u.	0278	SL	03/02/2010	0001	0.13	-	0.13	7.3		#		
pH	s.u.	0279	SL	03/02/2010	0001	0.17	-	0.17	7.7		#		
pH	s.u.	0438	WL	03/04/2010	0001	118	-	118	6.81		#		
pH	s.u.	0439	WL	03/04/2010	0001	118	-	118	6.93		#		
pH	s.u.	0441	WL	03/03/2010	0001	53	-	53	7.3		#		
pH	s.u.	0453	WL	03/04/2010	0001	77	-	77	7.22		#		
pH	s.u.	0454	WL	03/03/2010	0001	13	-	13	6.86		#		
pH	s.u.	0495	WL	03/01/2010	0001	4.6	-	5.6	6.85		#		
pH	s.u.	0496	WL	03/01/2010	0001	2.2	-	3.2	9		#		
pH	s.u.	0562	WL	03/02/2010	0001	1.3	-	2.3	7.06		#		
pH	s.u.	0563	WL	03/02/2010	0001	4.6	-	5.6	7.74		#		
pH	s.u.	0564	WL	03/02/2010	0001	1.2	-	2.2	8.26		#		
pH	s.u.	0565	WL	03/02/2010	0001	4	-	5	7.83		#		
pH	s.u.	0590	WL	03/01/2010	0001	1	-	2	8.13		#		
pH	s.u.	0591	WL	03/01/2010	0001	3.9	-	4.9	7.26		#		
pH	s.u.	0597	WL	03/01/2010	0001	9.3	-	10.3	6.92		#		
pH	s.u.	0598	WL	03/01/2010	0001	9.1	-	10.1	7.52		#		
pH	s.u.	0599	WL	03/01/2010	0001	9.4	-	10.4	7.17		#		
pH	s.u.	0603	WL	03/01/2010	0001	9.2	-	10.2	7.29		#		
pH	s.u.	0605	WL	03/02/2010	0001	9.4	-	10.4	7.62		#		
pH	s.u.	0606	WL	03/02/2010	0001	9.3	-	10.3	7.6		#		
pH	s.u.	0608	WL	03/02/2010	0001	8.9	-	9.9	7.91		#		
pH	s.u.	0611	WL	03/02/2010	0001	2.2	-	3.2	7.28		#		
pH	s.u.	0612	WL	03/02/2010	0001	4.3	-	5.3	7.35		#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 5/11/2010

Parameter	Units	Location ID	Location Type	Sample		Depth Range		Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID	(Ft BLS)	Lab		Data	QA		
pH	s.u.	0615	WL	03/02/2010	0001	1.4	- 2.4	8.01		#		
pH	s.u.	0616	WL	03/02/2010	0001	5.3	- 6.3	8.05		#		
pH	s.u.	0617	WL	03/01/2010	0001	1.7	- 2.7	7.23		#		
pH	s.u.	0618	WL	03/01/2010	0001	5.3	- 6.3	7.07		#		
pH	s.u.	0690	WL	03/01/2010	0001	3.3	- 4.3	7.42		#		
pH	s.u.	0691	WL	03/01/2010	0001	6.5	- 7.5	7.44		#		
pH	s.u.	0692	WL	03/01/2010	0001	9.7	- 10.1	7.42		#		
pH	s.u.	0696	WL	03/01/2010	0001	1.3	- 2.3	7.22		#		
pH	s.u.	0697	WL	03/01/2010	0001	4.3	- 5.3	8.83		#		
pH	s.u.	0790	WL	03/03/2010	0001	2	- 3	6.93		#		
pH	s.u.	0791	WL	03/03/2010	0001	4.3	- 5.3	7.38		#		
pH	s.u.	0792	WL	03/03/2010	0001	9.3	- 10.3	8.09		#		
pH	s.u.	0793	WL	03/03/2010	0001	2	- 3	8.72		#		
Polonium-210	pCi/L	0438	WL	03/04/2010	0001	118	- 118	0.24	U	#	0.24	0.18
Polonium-210	pCi/L	0439	WL	03/04/2010	0001	118	- 118	0.27	U	#	0.27	0.13
Polonium-210	pCi/L	0441	WL	03/03/2010	0001	53	- 53	0.25	U	#	0.25	0.17
Polonium-210	pCi/L	0453	WL	03/04/2010	0001	77	- 77	0.39	U	#	0.39	0.18
Polonium-210	pCi/L	0454	WL	03/03/2010	0001	13	- 13	0.29	U	#	0.29	0.16
Selenium	mg/L	0453	WL	03/04/2010	0001	77	- 77	0.28		J	#	0.0012
Selenium	mg/L	0496	WL	03/01/2010	0001	2.2	- 3.2	0.0027		J	#	0.00012
Selenium	mg/L	0597	WL	03/01/2010	0001	9.3	- 10.3	0.012	E	#	#	0.00012
Selenium	mg/L	0598	WL	03/01/2010	0001	9.1	- 10.1	0.0069		#	#	0.00012
Selenium	mg/L	0599	WL	03/01/2010	0001	9.4	- 10.4	0.0097		#	#	0.00012
Selenium	mg/L	0606	WL	03/02/2010	0001	9.3	- 10.3	0.0038		J	#	0.00012
Selenium	mg/L	0617	WL	03/01/2010	0001	1.7	- 2.7	0.009		#	#	0.00012
Selenium	mg/L	0618	WL	03/01/2010	0001	5.3	- 6.3	0.011		#	#	0.00012
Selenium	mg/L	0691	WL	03/01/2010	0001	6.5	- 7.5	0.0073		#	#	0.00012

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 5/11/2010

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID	Lab	Data	QA					
Selenium	mg/L	0696	WL	03/01/2010	0001	1.3	-	2.3	0.0029		#	0.00012	
Selenium	mg/L	0697	WL	03/01/2010	0001	4.3	-	5.3	0.0047		#	0.00012	
Selenium	mg/L	0792	WL	03/03/2010	0001	9.3	-	10.3	0.00059	J	#	0.00012	
Specific Conductance	µmhos/cm	0239	SL	03/02/2010	0001	0.25	-	0.25	2777		#		
Specific Conductance	µmhos/cm	0243	SL	03/01/2010	0001	0.33	-	0.33	2157		#		
Specific Conductance	µmhos/cm	0259	SL	03/01/2010	0001	0.17	-	0.17	1828		#		
Specific Conductance	µmhos/cm	0274	SL	02/25/2010	0001	0.25	-	0.25	30401		#		
Specific Conductance	µmhos/cm	0274	SL	03/02/2010	0001	0.25	-	0.25	30043		#		
Specific Conductance	µmhos/cm	0277	SL	03/02/2010	0001	0.17	-	0.17	7002		#		
Specific Conductance	µmhos/cm	0278	SL	03/02/2010	0001	0.13	-	0.13	10087		#		
Specific Conductance	µmhos/cm	0279	SL	03/02/2010	0001	0.17	-	0.17	6875		#		
Specific Conductance	µmhos/cm	0438	WL	03/04/2010	0001	118	-	118	9424		#		
Specific Conductance	µmhos/cm	0439	WL	03/04/2010	0001	118	-	118	10705		#		
Specific Conductance	µmhos/cm	0441	WL	03/03/2010	0001	53	-	53	42.42		#		
Specific Conductance	µmhos/cm	0453	WL	03/04/2010	0001	77	-	77	30686		#		
Specific Conductance	µmhos/cm	0454	WL	03/03/2010	0001	13	-	13	66316		#		
Specific Conductance	µmhos/cm	0495	WL	03/01/2010	0001	4.6	-	5.6	5507		#		
Specific Conductance	µmhos/cm	0496	WL	03/01/2010	0001	2.2	-	3.2	8491		#		
Specific Conductance	µmhos/cm	0562	WL	03/02/2010	0001	1.3	-	2.3	6207		#		
Specific Conductance	µmhos/cm	0563	WL	03/02/2010	0001	4.6	-	5.6	9648		#		
Specific Conductance	µmhos/cm	0564	WL	03/02/2010	0001	1.2	-	2.2	2180		#		
Specific Conductance	µmhos/cm	0565	WL	03/02/2010	0001	4	-	5	4682		#		
Specific Conductance	µmhos/cm	0590	WL	03/01/2010	0001	1	-	2	4996		#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 5/11/2010

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	03/01/2010	0001	3.9	-	4.9	5904		#		
Specific Conductance	µmhos/cm	0597	WL	03/01/2010	0001	9.3	-	10.3	11015		#		
Specific Conductance	µmhos/cm	0598	WL	03/01/2010	0001	9.1	-	10.1	11018		#		
Specific Conductance	µmhos/cm	0599	WL	03/01/2010	0001	9.4	-	10.4	13192		#		
Specific Conductance	µmhos/cm	0603	WL	03/01/2010	0001	9.2	-	10.2	13371		#		
Specific Conductance	µmhos/cm	0605	WL	03/02/2010	0001	9.4	-	10.4	18181		#		
Specific Conductance	µmhos/cm	0606	WL	03/02/2010	0001	9.3	-	10.3	16041		#		
Specific Conductance	µmhos/cm	0608	WL	03/02/2010	0001	8.9	-	9.9	13995		#		
Specific Conductance	µmhos/cm	0611	WL	03/02/2010	0001	2.2	-	3.2	5365		#		
Specific Conductance	µmhos/cm	0612	WL	03/02/2010	0001	4.3	-	5.3	7423		#		
Specific Conductance	µmhos/cm	0615	WL	03/02/2010	0001	1.4	-	2.4	5708		#		
Specific Conductance	µmhos/cm	0616	WL	03/02/2010	0001	5.3	-	6.3	8697		#		
Specific Conductance	µmhos/cm	0617	WL	03/01/2010	0001	1.7	-	2.7	11050		#		
Specific Conductance	µmhos/cm	0618	WL	03/01/2010	0001	5.3	-	6.3	11195		#		
Specific Conductance	µmhos/cm	0690	WL	03/01/2010	0001	3.3	-	4.3	6238		#		
Specific Conductance	µmhos/cm	0691	WL	03/01/2010	0001	6.5	-	7.5	8714		#		
Specific Conductance	µmhos/cm	0692	WL	03/01/2010	0001	9.7	-	10.1	14427		#		
Specific Conductance	µmhos/cm	0696	WL	03/01/2010	0001	1.3	-	2.3	6100		#		
Specific Conductance	µmhos/cm	0697	WL	03/01/2010	0001	4.3	-	5.3	12100		#		
Specific Conductance	µmhos/cm	0790	WL	03/03/2010	0001	2	-	3	21108		#		
Specific Conductance	µmhos/cm	0791	WL	03/03/2010	0001	4.3	-	5.3	30246		#		
Specific Conductance	µmhos/cm	0792	WL	03/03/2010	0001	9.3	-	10.3	17776		#		
Specific Conductance	µmhos	0793	WL	03/03/2010	0001	2	-	3	2229		#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 5/11/2010

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
										Lab	Data	QA		
	/cm													
Temperature	C	0239	SL	03/02/2010	0001	0.25	-	0.25	4.75				#	
Temperature	C	0243	SL	03/01/2010	0001	0.33	-	0.33	6.54				#	
Temperature	C	0259	SL	03/01/2010	0001	0.17	-	0.17	10.62				#	
Temperature	C	0274	SL	02/25/2010	0001	0.25	-	0.25	17.45				#	
Temperature	C	0274	SL	03/02/2010	0001	0.25	-	0.25	18.15				#	
Temperature	C	0277	SL	03/02/2010	0001	0.17	-	0.17	15				#	
Temperature	C	0278	SL	03/02/2010	0001	0.13	-	0.13	13.73				#	
Temperature	C	0279	SL	03/02/2010	0001	0.17	-	0.17	18.9				#	
Temperature	C	0438	WL	03/04/2010	0001	118	-	118	14.63				#	
Temperature	C	0439	WL	03/04/2010	0001	118	-	118	14.29				#	
Temperature	C	0441	WL	03/03/2010	0001	53	-	53	15.26				#	
Temperature	C	0453	WL	03/04/2010	0001	77	-	77	15.12				#	
Temperature	C	0454	WL	03/03/2010	0001	13	-	13	15.33				#	
Temperature	C	0495	WL	03/01/2010	0001	4.6	-	5.6	9.12				#	
Temperature	C	0496	WL	03/01/2010	0001	2.2	-	3.2	7.7				#	
Temperature	C	0562	WL	03/02/2010	0001	1.3	-	2.3	7.2				#	
Temperature	C	0563	WL	03/02/2010	0001	4.6	-	5.6	8.97				#	
Temperature	C	0564	WL	03/02/2010	0001	1.2	-	2.2	5.86				#	
Temperature	C	0565	WL	03/02/2010	0001	4	-	5	4.83				#	
Temperature	C	0590	WL	03/01/2010	0001	1	-	2	9.26				#	
Temperature	C	0591	WL	03/01/2010	0001	3.9	-	4.9	7.26				#	
Temperature	C	0597	WL	03/01/2010	0001	9.3	-	10.3	11.68				#	
Temperature	C	0598	WL	03/01/2010	0001	9.1	-	10.1	10.28				#	
Temperature	C	0599	WL	03/01/2010	0001	9.4	-	10.4	10.76				#	
Temperature	C	0603	WL	03/01/2010	0001	9.2	-	10.2	9.19				#	
Temperature	C	0605	WL	03/02/2010	0001	9.4	-	10.4	9.76				#	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 5/11/2010

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Lab	Data QA		
Temperature	C	0606	WL	03/02/2010	0001	9.3	-	10.3	9.81		#		
Temperature	C	0608	WL	03/02/2010	0001	8.9	-	9.9	7.92		#		
Temperature	C	0611	WL	03/02/2010	0001	2.2	-	3.2	6.67		#		
Temperature	C	0612	WL	03/02/2010	0001	4.3	-	5.3	5.68		#		
Temperature	C	0615	WL	03/02/2010	0001	1.4	-	2.4	9.2		#		
Temperature	C	0616	WL	03/02/2010	0001	5.3	-	6.3	8.55		#		
Temperature	C	0617	WL	03/01/2010	0001	1.7	-	2.7	8.18		#		
Temperature	C	0618	WL	03/01/2010	0001	5.3	-	6.3	9.17		#		
Temperature	C	0690	WL	03/01/2010	0001	3.3	-	4.3	12.79		#		
Temperature	C	0691	WL	03/01/2010	0001	6.5	-	7.5	11.37		#		
Temperature	C	0692	WL	03/01/2010	0001	9.7	-	10.1	11.78		#		
Temperature	C	0696	WL	03/01/2010	0001	1.3	-	2.3	5.55		#		
Temperature	C	0697	WL	03/01/2010	0001	4.3	-	5.3	10.97		#		
Temperature	C	0790	WL	03/03/2010	0001	2	-	3	12.27		#		
Temperature	C	0791	WL	03/03/2010	0001	4.3	-	5.3	11.94		#		
Temperature	C	0792	WL	03/03/2010	0001	9.3	-	10.3	11.75		#		
Temperature	C	0793	WL	03/03/2010	0001	2	-	3	8.51		#		
Total Dissolved Solids	mg/L	0239	SL	03/02/2010	0001	0.25	-	0.25	1000		#	40	
Total Dissolved Solids	mg/L	0239	SL	03/02/2010	0002	0	-	0	1100		#	40	
Total Dissolved Solids	mg/L	0243	SL	03/01/2010	0001	0.33	-	0.33	920		#	40	
Total Dissolved Solids	mg/L	0259	SL	03/01/2010	0001	0.17	-	0.17	1000		#	40	
Total Dissolved Solids	mg/L	0274	SL	02/25/2010	0001	0.25	-	0.25	20000	J	#	400	
Total Dissolved Solids	mg/L	0274	SL	03/02/2010	0001	0.25	-	0.25	23000		#	400	
Total Dissolved Solids	mg/L	0277	SL	03/02/2010	0001	0.17	-	0.17	4800		#	200	
Total Dissolved Solids	mg/L	0278	SL	03/02/2010	0001	0.13	-	0.13	7100		#	200	
Total Dissolved Solids	mg/L	0279	SL	03/02/2010	0001	0.17	-	0.17	3500		#	80	
Total Dissolved Solids	mg/L	0279	SL	03/02/2010	0002	0	-	0	4100		#	200	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 5/11/2010

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	0441	WL	03/03/2010	0001	53	-	53	2800		#	80	
Total Dissolved Solids	mg/L	0453	WL	03/04/2010	0001	77	-	77	21000		#	400	
Total Dissolved Solids	mg/L	0453	WL	03/04/2010	0002	0	-	0	22000		#	400	
Total Dissolved Solids	mg/L	0495	WL	03/01/2010	0001	4.6	-	5.6	5500		#	80	
Total Dissolved Solids	mg/L	0496	WL	03/01/2010	0001	2.2	-	3.2	6100		#	80	
Total Dissolved Solids	mg/L	0562	WL	03/02/2010	0001	1.3	-	2.3	4800		#	80	
Total Dissolved Solids	mg/L	0563	WL	03/02/2010	0001	4.6	-	5.6	6200		#	80	
Total Dissolved Solids	mg/L	0564	WL	03/02/2010	0001	1.2	-	2.2	1200		#	40	
Total Dissolved Solids	mg/L	0565	WL	03/02/2010	0001	4	-	5	3800		#	80	
Total Dissolved Solids	mg/L	0590	WL	03/01/2010	0001	1	-	2	4700		#	80	
Total Dissolved Solids	mg/L	0591	WL	03/01/2010	0001	3.9	-	4.9	4600		#	80	
Total Dissolved Solids	mg/L	0597	WL	03/01/2010	0001	9.3	-	10.3	8800		#	200	
Total Dissolved Solids	mg/L	0598	WL	03/01/2010	0001	9.1	-	10.1	7800		#	200	
Total Dissolved Solids	mg/L	0599	WL	03/01/2010	0001	9.4	-	10.4	11000		#	200	
Total Dissolved Solids	mg/L	0603	WL	03/01/2010	0001	9.2	-	10.2	11000		#	200	
Total Dissolved Solids	mg/L	0605	WL	03/02/2010	0001	9.4	-	10.4	14000		#	200	
Total Dissolved Solids	mg/L	0606	WL	03/02/2010	0001	9.3	-	10.3	12000		#	200	
Total Dissolved Solids	mg/L	0608	WL	03/02/2010	0001	8.9	-	9.9	12000		#	200	
Total Dissolved Solids	mg/L	0611	WL	03/02/2010	0001	2.2	-	3.2	4600		#	80	
Total Dissolved Solids	mg/L	0612	WL	03/02/2010	0001	4.3	-	5.3	5500		#	80	
Total Dissolved Solids	mg/L	0615	WL	03/02/2010	0001	1.4	-	2.4	3700		#	80	
Total Dissolved Solids	mg/L	0616	WL	03/02/2010	0001	5.3	-	6.3	5600		#	80	
Total Dissolved Solids	mg/L	0617	WL	03/01/2010	0001	1.7	-	2.7	8500		#	200	
Total Dissolved Solids	mg/L	0618	WL	03/01/2010	0001	5.3	-	6.3	8600		#	200	
Total Dissolved Solids	mg/L	0690	WL	03/01/2010	0001	3.3	-	4.3	5200		#	80	
Total Dissolved Solids	mg/L	0691	WL	03/01/2010	0001	6.5	-	7.5	7800		#	200	
Total Dissolved Solids	mg/L	0692	WL	03/01/2010	0001	9.7	-	10.1	12000		#	200	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 5/11/2010

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	0696	WL	03/01/2010	0001	1.3	-	2.3	4100		#	80	
Total Dissolved Solids	mg/L	0697	WL	03/01/2010	0001	4.3	-	5.3	9500		#	200	
Total Dissolved Solids	mg/L	0790	WL	03/03/2010	0001	2	-	3	16000		#	400	
Total Dissolved Solids	mg/L	0791	WL	03/03/2010	0001	4.3	-	5.3	24000		#	400	
Total Dissolved Solids	mg/L	0792	WL	03/03/2010	0001	9.3	-	10.3	11000		#	400	
Total Dissolved Solids	mg/L	0793	WL	03/03/2010	0001	2	-	3	920		#	40	
Turbidity	NTU	0239	SL	03/02/2010	0001	0.25	-	0.25	92.6		#		
Turbidity	NTU	0243	SL	03/01/2010	0001	0.33	-	0.33	60		#		
Turbidity	NTU	0259	SL	03/01/2010	0001	0.17	-	0.17	150		#		
Turbidity	NTU	0274	SL	02/25/2010	0001	0.25	-	0.25	54.2		#		
Turbidity	NTU	0274	SL	03/02/2010	0001	0.25	-	0.25	148		#		
Turbidity	NTU	0277	SL	03/02/2010	0001	0.17	-	0.17	113		#		
Turbidity	NTU	0278	SL	03/02/2010	0001	0.13	-	0.13	549		#		
Turbidity	NTU	0279	SL	03/02/2010	0001	0.17	-	0.17	185		#		
Turbidity	NTU	0438	WL	03/04/2010	0001	118	-	118	1.68		#		
Turbidity	NTU	0439	WL	03/04/2010	0001	118	-	118	2.79		#		
Turbidity	NTU	0441	WL	03/03/2010	0001	53	-	53	6.45		#		
Turbidity	NTU	0453	WL	03/04/2010	0001	77	-	77	41.3		#		
Turbidity	NTU	0454	WL	03/03/2010	0001	13	-	13	12.6		#		
Turbidity	NTU	0495	WL	03/01/2010	0001	4.6	-	5.6	181		#		
Turbidity	NTU	0496	WL	03/01/2010	0001	2.2	-	3.2	130		#		
Turbidity	NTU	0562	WL	03/02/2010	0001	1.3	-	2.3	60		#		
Turbidity	NTU	0563	WL	03/02/2010	0001	4.6	-	5.6	695		#		
Turbidity	NTU	0564	WL	03/02/2010	0001	1.2	-	2.2	26.2		#		
Turbidity	NTU	0565	WL	03/02/2010	0001	4	-	5	94.9		#		
Turbidity	NTU	0590	WL	03/01/2010	0001	1	-	2	161		#		
Turbidity	NTU	0591	WL	03/01/2010	0001	3.9	-	4.9	11		#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 5/11/2010

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
						Lab	Data	QA					
Turbidity	NTU	0597	WL	03/01/2010	0001	9.3	-	10.3	21.4		#		
Turbidity	NTU	0598	WL	03/01/2010	0001	9.1	-	10.1	94.9		#		
Turbidity	NTU	0599	WL	03/01/2010	0001	9.4	-	10.4	92.4		#		
Turbidity	NTU	0605	WL	03/02/2010	0001	9.4	-	10.4	70.1		#		
Turbidity	NTU	0606	WL	03/02/2010	0001	9.3	-	10.3	77.3		#		
Turbidity	NTU	0608	WL	03/02/2010	0001	8.9	-	9.9	42.9		#		
Turbidity	NTU	0611	WL	03/02/2010	0001	2.2	-	3.2	481		#		
Turbidity	NTU	0612	WL	03/02/2010	0001	4.3	-	5.3	129		#		
Turbidity	NTU	0616	WL	03/02/2010	0001	5.3	-	6.3	40.7		#		
Turbidity	NTU	0617	WL	03/01/2010	0001	1.7	-	2.7	75.1		#		
Turbidity	NTU	0618	WL	03/01/2010	0001	5.3	-	6.3	22.4		#		
Turbidity	NTU	0690	WL	03/01/2010	0001	3.3	-	4.3	121		#		
Turbidity	NTU	0691	WL	03/01/2010	0001	6.5	-	7.5	318		#		
Turbidity	NTU	0692	WL	03/01/2010	0001	9.7	-	10.1	119		#		
Turbidity	NTU	0696	WL	03/01/2010	0001	1.3	-	2.3	12.1		#		
Turbidity	NTU	0697	WL	03/01/2010	0001	4.3	-	5.3	175		#		
Turbidity	NTU	0790	WL	03/03/2010	0001	2	-	3	5.78		#		
Turbidity	NTU	0791	WL	03/03/2010	0001	4.3	-	5.3	94.4		#		
Turbidity	NTU	0792	WL	03/03/2010	0001	9.3	-	10.3	192		#		
Turbidity	NTU	0793	WL	03/03/2010	0001	2	-	3	17.74		#		
Uranium	mg/L	0239	SL	03/02/2010	0001	0.25	-	0.25	0.054		#	1.8E-006	
Uranium	mg/L	0239	SL	03/02/2010	0002	0	-	0	0.051		#	1.8E-006	
Uranium	mg/L	0243	SL	03/01/2010	0001	0.33	-	0.33	0.038		#	1.8E-006	
Uranium	mg/L	0259	SL	03/01/2010	0001	0.17	-	0.17	0.045		#	1.8E-006	
Uranium	mg/L	0274	SL	02/25/2010	0001	0.25	-	0.25	2.4		#	8.8E-005	
Uranium	mg/L	0274	SL	03/02/2010	0001	0.25	-	0.25	2.8		#	8.8E-005	
Uranium	mg/L	0277	SL	03/02/2010	0001	0.17	-	0.17	0.81		#	8.8E-005	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 5/11/2010

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Lab	Data QA		
Uranium	mg/L	0278	SL	03/02/2010	0001	0.13	-	0.13	1.3		#	8.8E-005	
Uranium	mg/L	0279	SL	03/02/2010	0001	0.17	-	0.17	0.3		#	8.8E-005	
Uranium	mg/L	0279	SL	03/02/2010	0002	0	-	0	0.39		#	8.8E-005	
Uranium	mg/L	0441	WL	03/03/2010	0001	53	-	53	0.025		#	1.8E-006	
Uranium	mg/L	0453	WL	03/04/2010	0001	77	-	77	2.3		#	8.8E-005	
Uranium	mg/L	0453	WL	03/04/2010	0002	0	-	0	2.2		#	8.8E-005	
Uranium	mg/L	0495	WL	03/01/2010	0001	4.6	-	5.6	1.6		#	8.8E-005	
Uranium	mg/L	0496	WL	03/01/2010	0001	2.2	-	3.2	4		#	0.00018	
Uranium	mg/L	0562	WL	03/02/2010	0001	1.3	-	2.3	0.99		#	8.8E-005	
Uranium	mg/L	0563	WL	03/02/2010	0001	4.6	-	5.6	1.2		#	8.8E-005	
Uranium	mg/L	0564	WL	03/02/2010	0001	1.2	-	2.2	0.0086		#	1.8E-006	
Uranium	mg/L	0565	WL	03/02/2010	0001	4	-	5	0.34		#	1.8E-005	
Uranium	mg/L	0590	WL	03/01/2010	0001	1	-	2	0.88		#	8.8E-005	
Uranium	mg/L	0591	WL	03/01/2010	0001	3.9	-	4.9	0.86		#	8.8E-005	
Uranium	mg/L	0597	WL	03/01/2010	0001	9.3	-	10.3	1.5		#	8.8E-005	
Uranium	mg/L	0598	WL	03/01/2010	0001	9.1	-	10.1	1.4		#	8.8E-005	
Uranium	mg/L	0599	WL	03/01/2010	0001	9.4	-	10.4	2.1		#	8.8E-005	
Uranium	mg/L	0603	WL	03/01/2010	0001	9.2	-	10.2	2		#	8.8E-005	
Uranium	mg/L	0605	WL	03/02/2010	0001	9.4	-	10.4	1.7		#	8.8E-005	
Uranium	mg/L	0606	WL	03/02/2010	0001	9.3	-	10.3	1.4		#	8.8E-005	
Uranium	mg/L	0608	WL	03/02/2010	0001	8.9	-	9.9	1.3		#	8.8E-005	
Uranium	mg/L	0611	WL	03/02/2010	0001	2.2	-	3.2	0.37		#	8.8E-005	
Uranium	mg/L	0612	WL	03/02/2010	0001	4.3	-	5.3	0.83		#	8.8E-005	
Uranium	mg/L	0615	WL	03/02/2010	0001	1.4	-	2.4	0.38		#	8.8E-005	
Uranium	mg/L	0616	WL	03/02/2010	0001	5.3	-	6.3	0.74		#	8.8E-005	
Uranium	mg/L	0617	WL	03/01/2010	0001	1.7	-	2.7	1.6		#	8.8E-005	
Uranium	mg/L	0618	WL	03/01/2010	0001	5.3	-	6.3	1.6		#	8.8E-005	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 5/11/2010

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Lab	Data QA		
Uranium	mg/L	0690	WL	03/01/2010	0001	3.3	-	4.3	0.76		#	8.8E-005	
Uranium	mg/L	0691	WL	03/01/2010	0001	6.5	-	7.5	1.5		#	8.8E-005	
Uranium	mg/L	0692	WL	03/01/2010	0001	9.7	-	10.1	2.3		#	8.8E-005	
Uranium	mg/L	0696	WL	03/01/2010	0001	1.3	-	2.3	0.53		#	8.8E-005	
Uranium	mg/L	0697	WL	03/01/2010	0001	4.3	-	5.3	1.4		#	8.8E-005	
Uranium	mg/L	0790	WL	03/03/2010	0001	2	-	3	2.8		#	8.8E-005	
Uranium	mg/L	0791	WL	03/03/2010	0001	4.3	-	5.3	3.1		#	8.8E-005	
Uranium	mg/L	0792	WL	03/03/2010	0001	9.3	-	10.3	0.33		#	1.8E-005	
Uranium	mg/L	0793	WL	03/03/2010	0001	2	-	3	0.015		#	1.8E-006	
Uranium-234	pCi/L	0438	WL	03/04/2010	0001	118	-	118	600	M3	#	0	110
Uranium-234	pCi/L	0439	WL	03/04/2010	0001	118	-	118	286	M3	#	0	50
Uranium-234	pCi/L	0441	WL	03/03/2010	0001	53	-	53	10.1		#	0.1	1.8
Uranium-234	pCi/L	0453	WL	03/04/2010	0001	77	-	77	730	M3	#	0	120
Uranium-234	pCi/L	0454	WL	03/03/2010	0001	13	-	13	840	M3	#	0	150
Uranium-235	pCi/L	0438	WL	03/04/2010	0001	118	-	118	26	M3	#	0.3	5.8
Uranium-235	pCi/L	0439	WL	03/04/2010	0001	118	-	118	12.5	M3	#	0.3	2.7
Uranium-235	pCi/L	0441	WL	03/03/2010	0001	53	-	53	0.53		#	0.09	0.2
Uranium-235	pCi/L	0453	WL	03/04/2010	0001	77	-	77	42.3	M3	#	0.9	8.9
Uranium-235	pCi/L	0454	WL	03/03/2010	0001	13	-	13	40.3	M3	#	1	8.9
Uranium-238	pCi/L	0438	WL	03/04/2010	0001	118	-	118	590	M3	#	0	110
Uranium-238	pCi/L	0439	WL	03/04/2010	0001	118	-	118	268	M3	#	0	46
Uranium-238	pCi/L	0441	WL	03/03/2010	0001	53	-	53	8		#	0.1	1.5
Uranium-238	pCi/L	0453	WL	03/04/2010	0001	77	-	77	760	M3	#	0	130
Uranium-238	pCi/L	0454	WL	03/03/2010	0001	13	-	13	860	M3	#	0	160

Ft BLS = feet 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 micrometer); N00X = Unfiltered sample; X = replicate number.

Appendix C. Water Quality Data (continued)

LAB QUALIFIERS:

*	Replicate analysis not within control limits.
>	Result above upper detection limit.
A	Tentatively identified compound is a suspected aldol-condensation product.
B	Inorganic: Result is between the instrument detection limit 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: Tentatively identified compound.
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.	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
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Appendix D.
Water Level Data

Appendix D. Water Level Data

STATIC WATER LEVELS (USEE700) FOR SITE MOA01, Moab Site
REPORT DATE: 5/20/2010

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0438	O	4054.22	03/04/2010		97.15	3957.07	
0439	O	4055.27	03/04/2010		98.43	3956.84	
0441			03/03/2010		49.5		
0453			03/04/2010		73.94		
0454			03/03/2010		12.29		
0495		3959.89	03/01/2010		6.07	3953.82	
0496		3956.98	03/01/2010		3.4	3953.58	
0559		3969.92	03/01/2010		3.35	3966.57	
0562		3955.37	03/02/2010		3.16	3952.21	
0563		3958.04	03/02/2010		5.93	3952.11	
0564		3956.03	03/02/2010		3.83	3952.2	
0565		3955.47	03/02/2010		3.23	3952.24	
0590		3956.19	03/01/2010		3.12	3953.07	
0591		3955.2	03/01/2010		2.05	3953.15	
0597		3959.11	03/01/2010		5.26	3953.85	
0598		3957.01	03/01/2010		3.27	3953.74	
0599		3956.52	03/01/2010		3.35	3953.17	
0603		3955.1	03/01/2010		1.78	3953.32	
0605		3956.92	03/02/2010		4.11	3952.81	
0606		3955.69	03/02/2010		3.18	3952.51	
0608		3955.71	03/02/2010		3.4	3952.31	
0611		3957.48	03/02/2010		5.24	3952.24	
0612		3955.27	03/02/2010		2.91	3952.36	
0615		3956.78	03/02/2010		3.96	3952.82	
0616		3955.97	03/02/2010		3.14	3952.83	
0617		3955.85	03/01/2010		2.7	3953.15	
0618		3955.16	03/01/2010		2.18	3952.98	

Appendix D. Water Level Data (continued)

STATIC WATER LEVELS (USEE700) FOR SITE MOA01, Moab Site
REPORT DATE: 5/20/2010

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0690		3963.83	03/01/2010		5.98	3957.85	
0691		3962.7	03/01/2010		5.24	3957.46	
0692		3962.29	03/01/2010		5.28	3957.01	
0696		3956.42	03/01/2010		3.58	3952.84	
0697		3955.71	03/01/2010		2.54	3953.17	
0790		3955.2	03/03/2010		6.73	3948.47	
0791		3954.76	03/03/2010		6.26	3948.5	
0792		3954.84	03/03/2010		7.06	3947.78	
0793		3954.95	03/03/2010		3.42	3951.53	

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

Attachment 1.
IA Well Field Monthly Sampling Trip Report

Attachment 1. IA Well Field Monthly Sampling Trip Report



DATE: March 10, 2010
TO: K. Pill
FROM: T. Meadows
SUBJECT: March 2010 Monthly IA Well Field Sampling Trip Report

Site: Moab, Utah

Date of Sampling Event: February 25 to March 4, 2010

Team Members: Elizabeth Glowiak, Tyler Meadows, James Ritchey

RIN Number Assigned: All samples were assigned to RIN 1003042.

Sample Shipment: All samples were shipped in coolers overnight UPS to ALS Laboratory Group from Moab, Utah. One cooler was shipped on March 2, another on March 3, and two were shipped on March 4, 2010, with tracking numbers 0193846697, 0195306105, 0198665712, and 0196019727.

March 2010 CF1 Sampling

Number of Locations Sampled: Eight well points were sampled, (0562, 0563, 0564, 0565, 0606, 0608, 0611, and 0612). A total of nine samples were collected during the March 2010 sampling event.

Locations Not Sampled: No surface samples were taken due to the lack of water in the channel.

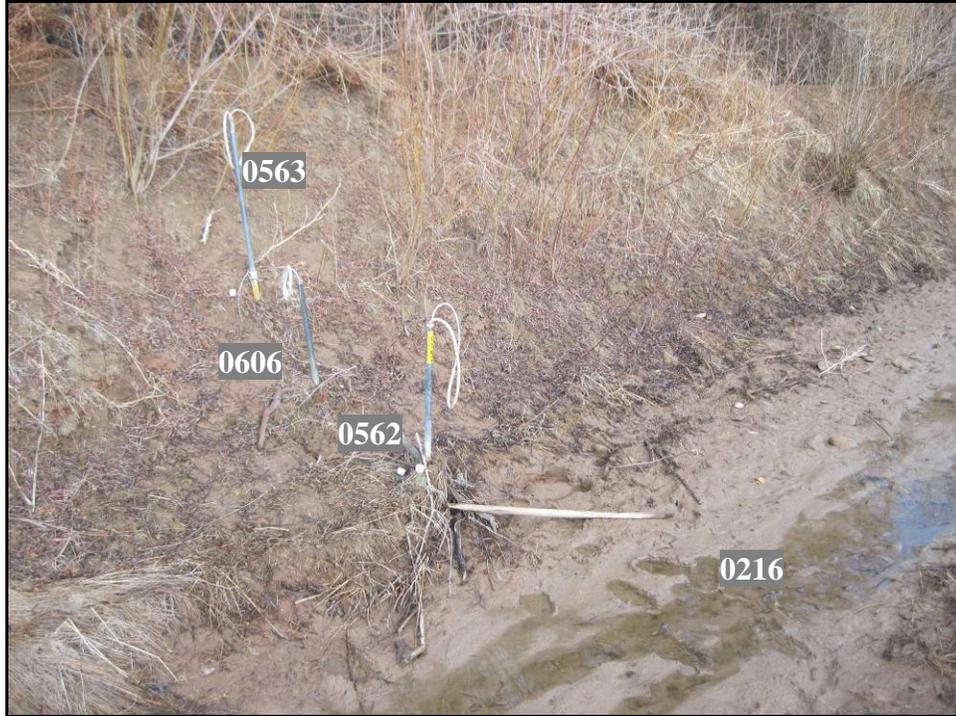
Field Variance: None.

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.

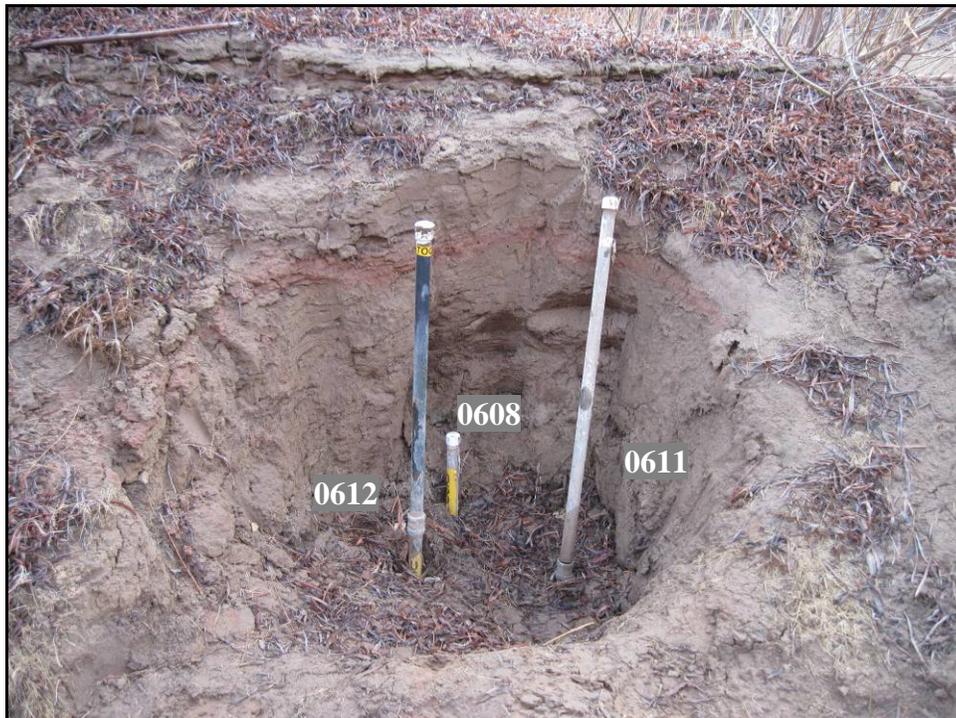
WP No.	Date	Time	Depth to Water (ft btoc)	Stick Up Height (ft)	Depth to River Surface (ft btoc)
0562	03/02/2010	09:41	3.16	1.83	Dry
0563	03/02/2010	10:02	5.93	2.95	Dry
0564	03/02/2010	10:58	3.83	2.50	Dry
0565	03/02/2010	11:02	3.23	2.10	Dry
0606	03/02/2010	09:51	3.18	1.62	Dry
0607	03/02/2010	10:58	3.52	2.70	Dry
0608	03/02/2010	10:27	3.40	0	Dry
0611	03/02/2010	10:22	5.24	0	Dry
0612	03/02/2010	10:36	2.91	0	Dry

ft = feet; ft btoc = feet below top of casing; WP = well point

Attachment 1. IA Well Field Monthly Sampling Trip Report (continued)



River Bank Well Points 0562, 0563, and 0606 and Dry Surface Water Location 0216



Intermediate Well Points 0608, 0611, and 0612

Attachment 1. IA Well Field Monthly Sampling Trip Report (continued)



River Edge Well Points 0564, 0565, and 0607



Dry Surface Water Location 0245

Attachment 1. IA Well Field Monthly Sampling Trip Report (continued)

March 2010 CF2 Sampling

Number of Locations Sampled: Six well points, (0590, 0591, 0603, 0605, 0615, and 0616), and one surface water location (0239) were sampled. Including a duplicate, a total of eight samples were collected during the March 2010 sampling event.

Locations Not Sampled: Surface water locations 0236 and 0240 were dry and not sampled.

Field Variance: None.

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
2000	0239	Duplicate	Surface water	MAR 023

ID = identification

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	03/01/2010	14:47	3.12	1.14	Dry
0591	03/01/2010	14:55	2.05	0.55	Dry
0603	03/01/2010	15:13	1.78	0	Dry
0605	03/02/2010	08:45	4.11	2.30	Dry
0615	03/02/2010	08:32	3.96	2.20	Dry
0616	03/02/2010	08:36	3.14	0.50	Dry

ft = feet; ft btoc = feet below top of casing; WP = well point

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

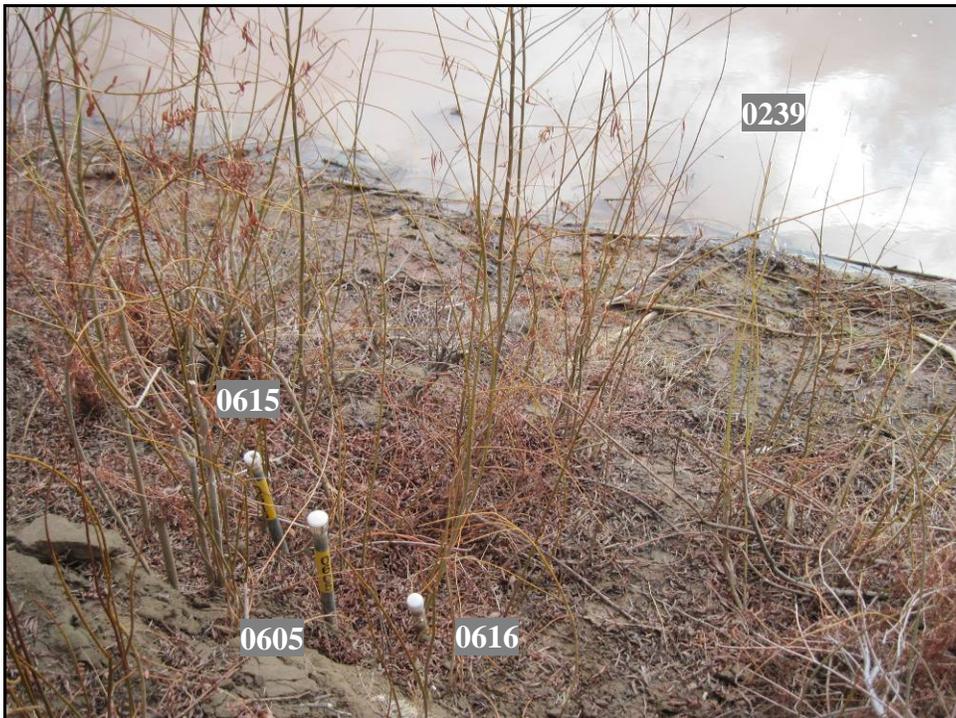
SW No.	Date	Time	Depth (inches below surface)	Characteristics
0239	03/02/2010	09:10	3 inches	Taken off main channel, ~3 inches deep, slow flow, silty substrate.

SW = surface water

Attachment 1. IA Well Field Monthly Sampling Trip Report (continued)



River Bank Well Points 0590, 0591, and 603 and Dry Surface Water Location 0240



River Edge Well Points 0605, 0615, and 0616 and Surface Water Location 0239

Attachment 1. IA Well Field Monthly Sampling Trip Report (continued)

March 2010 CF3 Sampling

Number of Locations Sampled: Five well points (0690, 0691, 0692, 0696, and 0697), and one surface water location (0259) were sampled. A total of six samples were collected during the March 2010 sampling event.

Locations Not Sampled: One of the river edge well points (0698) was dry, and a sample could not be collected. Surface water location 0258 was also dry and not sampled.

Field Variance: None.

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)
0690	03/01/2010	10:32	5.98	1.90	Dry
0691	03/01/2010	10:38	5.24	0.55	Dry
0692	03/01/2010	10:42	5.28	0.20	Dry
0696	03/01/2010	13:35	3.58	2.40	Dry
0697	03/01/2010	13:29	2.54	1.64	Dry

ft = feet; ft btoc = feet below top of casing; WP = well point

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

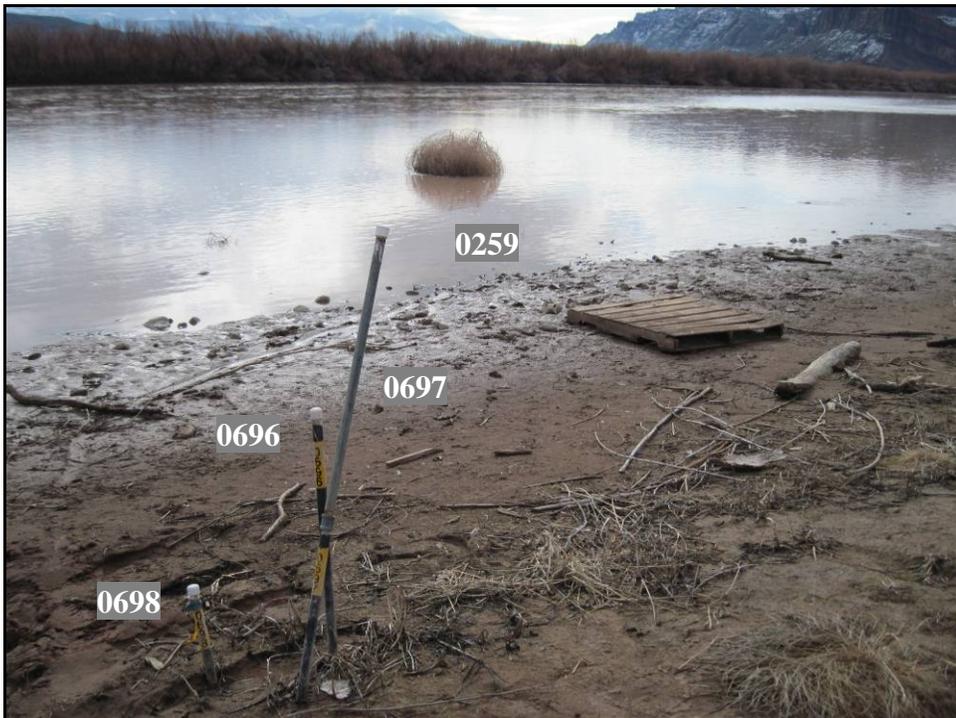
SW No.	Date	Time	Depth (inches below surface)	Characteristics
0259	03/01/2010	14:12	2 inches	1.5 feet off bank, slow flow, main river channel

SW = surface water

Attachment 1. IA Well Field Monthly Sampling Trip Report (continued)



River Bank Well Points 0690, 0691, and 0692



River Edge Well Points 0696, 0697, and 0698 and Surface Water Location 0259

Attachment 1. IA Well Field Monthly Sampling Trip Report (continued)

March 2010 CF4 Sampling

Number of Locations Sampled: Four well points, (0790, 0791, 0792, and 0793), and four surface water locations (0274, 0277, 0278, and 0279) were sampled; 0274 was sampled twice. Including one duplicate, a total of 10 samples were collected during the March 2010 sampling event.

Locations Not Sampled: Well point 0794 and 0795 did not contain enough water to sample.

Field Variance: None.

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
2001	0279	duplicate	Surface water	MAR 037

ID = identification

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)
0790	03/03/2010	08:42	6.73	2.45	Dry
0791	03/03/2010	08:56	6.26	2.30	Dry
0792	03/03/2010	08:51	7.06	2.90	Dry
0793	03/03/2010	09:26	3.42	2.20	Dry
0794	03/03/2010	09:24	6.05	2.10	Dry
0795	03/03/2010	09:19	11.14	3.20	Dry

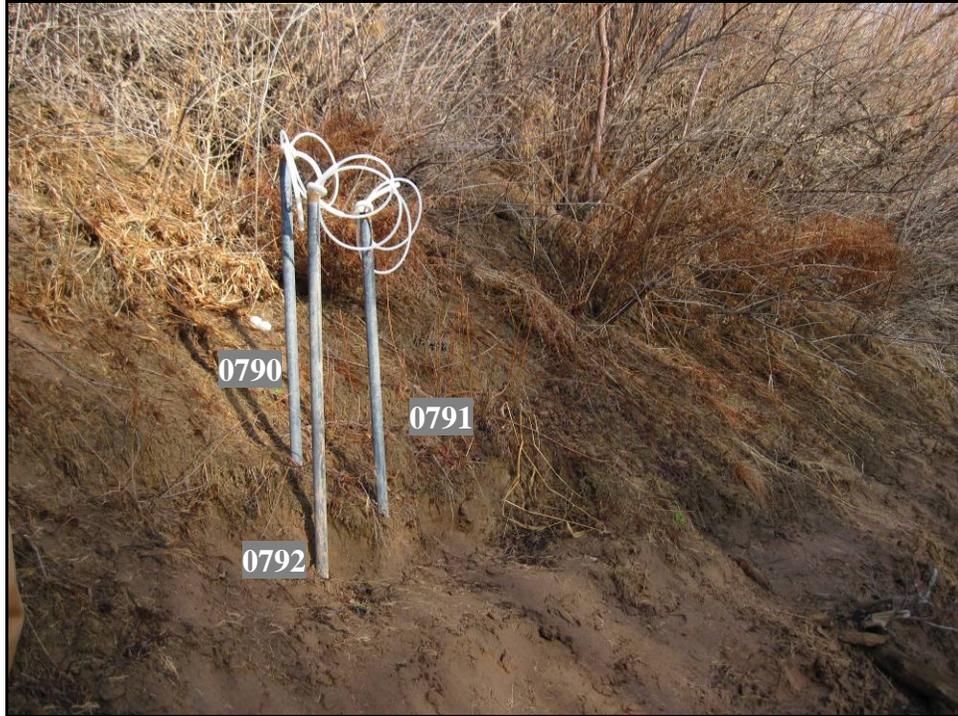
ft = feet; ft btoc = feet below top of casing; WP = well point

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

SW No.	Date	Time	Depth (inches below surface)	Characteristics
0274	02/25/2010	14:25	3 inches	~3 inches deep, barely connected up and down channel, bubbling, silty substrate
0274	03/02/2010	15:53	3 inches	Taken near intermediate well points.
0277	03/02/2010	15:30	2 inches	Stagnant water between CFs 1 and 4. Foamy surface.
0278	03/02/2010	15:37	1.5 inches	Taken ~6 inches off gravel bar; stagnant.
0279	03/02/2010	16:00	2 inches	Taken off south gravel bar, stagnant, open down river.

SW = surface water

Attachment 1. IA Well Field Monthly Sampling Trip Report (continued)



River Bank Well Points 0790, 0791, and 0792



*Intermediate Well Points 0793, 0794, and 0795 and
Surface Water Location 0274 (2 Feet Off Bank)*

Attachment 1. IA Well Field Monthly Sampling Trip Report (continued)



Surface Water Location 0277



Surface Water Location 0278

Attachment 1. IA Well Field Monthly Sampling Trip Report (continued)



Surface Water Location 0279

March 2010 Baseline Sampling

Number of Locations Sampled: Seven well points (0495, 0496, 0597, 0598, 0599, 0617, and 0618) and one surface water location (0243) were sampled. A total of eight samples were collected during the March 2010 sampling event.

Locations Not Sampled: Surface water locations 0241 and 0242 were dry and could not be sampled. Also, well points 0494 and 0497 did not recharge and were not sampled.

Field Variance: Well 0496 recharged at a low rate, and a limited volume sample was sent for analysis.

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)
0494	03/01/2010	08:15	Dry	0.60	Dry
0495	03/01/2010	08:19	6.07	1.30	Dry
0496	03/01/2010	08:51	3.40	0	Dry
0497	03/01/2010	08:55	Dry	0	Dry
0597	03/01/2010	08:24	5.26	0.70	Dry
0598	03/01/2010	08:57	3.27	0	Dry
0599	03/01/2010	09:38	3.35	3.00	Dry
0617	03/01/2010	09:22	2.70	2.45	Dry
0618	03/01/2010	09:29	2.18	1.90	Dry

Attachment 1. IA Well Field Monthly Sampling Trip Report (continued)

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

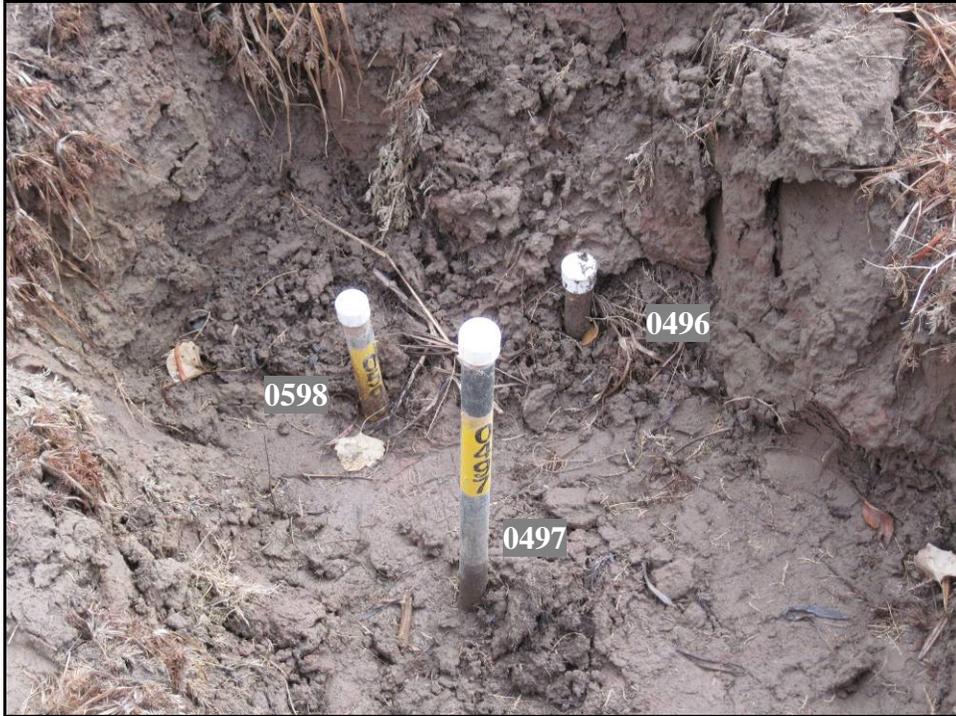
SW No.	Date	Time	Depth (inches below surface)	Characteristics
0243	03/01/2010	10:11	~4 inches	Taken off main river channel ~2 feet off bank near plant debris.

SW = surface water



River Bank Well Points 0494, 0495, and 0597

Attachment 1. IA Well Field Monthly Sampling Trip Report (continued)



Intermediate Well Points 0496, 0497, and 0598 and Dry Surface Water Location 0242



River Edge Well Points 0599, 0617, and 0618 and Surface Water Location 0243

Attachment 1. IA Well Field Monthly Sampling Trip Report (continued)

March 2010 Sampling of Monitoring Wells 0438, 0439, 0441, 0453, and 0454

Number of Locations Sampled: Five observation wells (0438, 0439, 0441, 0453, and 0454) were sampled. Including a duplicate, a total of six samples were collected during the March 2010 sampling event.

Field Variance: Wells 0438, 0439, and 0454, were analyzed for lead 210, polonium 210, and isotopic uranium only. Wells 0453 and 0441 were analyzed for the five usual constituents in addition.

Location-specific Information – Observation Well 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)	Sample Depth (ft bgs)
0438	03/03/2010	08:36	97.15	118
0439	03/04/2010	09:31	98.43	118
0441	03/03/2010	15:25	49.50	53
0453	03/04/2010	10:23	73.94	77
0454	03/03/2010	11:21	12.29	13

ft = feet; ft btoc = feet below top of casing; WP = well point

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
2002	0453	Duplicate	Ground water	MAR 046

ID = identification

Well Inspection Summary: A well inspection was not conducted.

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

Date	Daily Mean Flow (cfs)
02/25/2010	2,460
03/01/2010	2,780
03/02/2010	2,890
03/03/2010	2,870
03/04/2010	2,950

cfs = cubic feet per second

Equipment Issues: None.

Corrective Action Required/Taken: None.