DOE–EM/GJTAC1859

Office of Environmental Management – Grand Junction

UMTRA Project

Moab UMTRA Project September 2009 Validation Data Package for Performance Assessment of the Monthly Sampling for the Ground Water Interim Action

December 2009

U.S. Department of Energy

Office of Environmental Management

Prepared by the Technical Assistance Contractor under contract number DE-AC30-07CC60012 for the U.S. Department of Energy Office of Environmental Management, Grand Junction, Colorado.

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Moab UMTRA Project
September 2009 Monthly Ground Water Sampling Event

Revision 0

Review and Approval

Kenneth G. Pill
TAC Ground Water Manager

12/22/09
Date

Joseph D. Ritchey
TAC Senior Program Manager

12/22/09
Date

Revision History

Revision No.	Date	Reason/Basis for Revision
0	December 2009	Initial issue.

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Acronyms and Abbreviations

CF	Configuration
cfs	cubic feet per second
COC	chain of custody
EB	equipment blank
EDD	electronic data deliverable
EPA	Environmental Protection Agency
ft	feet
ft bgs	feet below ground surface
gpm	gallons per minute
IA	interim action
IDL	instrument detection limit
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
UMTRA	Uranium Mill Tailings Remedial Action
USGS	U.S. Geological Survey
VDP	validation data package

1.0 Introduction

The purpose of this document is to summarize the results of the data validation process associated with surface water and/or ground 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 table. 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 September 2009 monthly sampling event completed from September 11 through 24, 2009, in which ground water samples were collected from a variety of locations across the well field. Surface water samples were also collected from locations within Configuration (CF) 4 during this event, which was considered to be a habitat area at the time of the sampling event. 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 September 2009 monthly sampling event.

1.1 Summary Criteria

Sampling Period: September 11 through 24, 2009
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 Figure 1, and a summary of site conditions is presented in Figure 2. A summary of the CF4 habitat area sampling results are 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 pump rate changes, river flow, or other known causes?**

   No. There was only one anomalous data point associated with this sampling event based on the Minimums and Maximums Report, and it is more a function of the number of samples collected from the location as opposed to site-related issues.

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

   Yes. Extraction well PW02 was extracting ground water at rate of approximately 30 gallons per minute (gpm) throughout this sampling event. CF1 was restarted at an extraction rate of approximately 10 gpm after September 17, when a habitat developed off this area of the well field. CF3 was extracting ground water at a rate of approximately 60 gpm until

September 17, at which time it was shut down to control the pond level. CF4 wells were restarted at a rate of approximately 20 gpm on September 14, after a habitat area developed in the side channel adjacent to this area of the well field, and the rate was increased to 40 gpm after September 17. As a result, the total well field extraction rate was approximately 110 gpm through September 17, and decreased to approximately 80 gpm after that time.

3. Was the evaporation pond functioning properly?

Yes. The pond level ranged from 7.4 to 9.1 feet (ft) during this sampling event.

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

Yes.

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

No.

1.2 Sampling Event Summary

This VDP presents the validated data associated with the ground water collected during the September 2009 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 2 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 no anomalous data associated with this sampling event (see Anomalous Data Review in Section 3.2).

While independent of the data validation process, a brief summary of the most recent concentration trends based on the September 2009 data is provided for Baseline Area, CF3, CF2, CF1, and CF4 (listed from north to south) within the well field. In most instances, standard selected performance indicator monitoring wells were sampled during this event, and time versus concentration plots (ammonia, total dissolved solids [TDS], and uranium) are presented to display historical trends exhibited by the data over the past 2 years. Time versus concentration plots are also provided for the evaporation pond inlet sample location in this discussion. Colorado River flows over the same time frame are also plotted to determine whether the magnitude of river flows influences analyte concentrations.

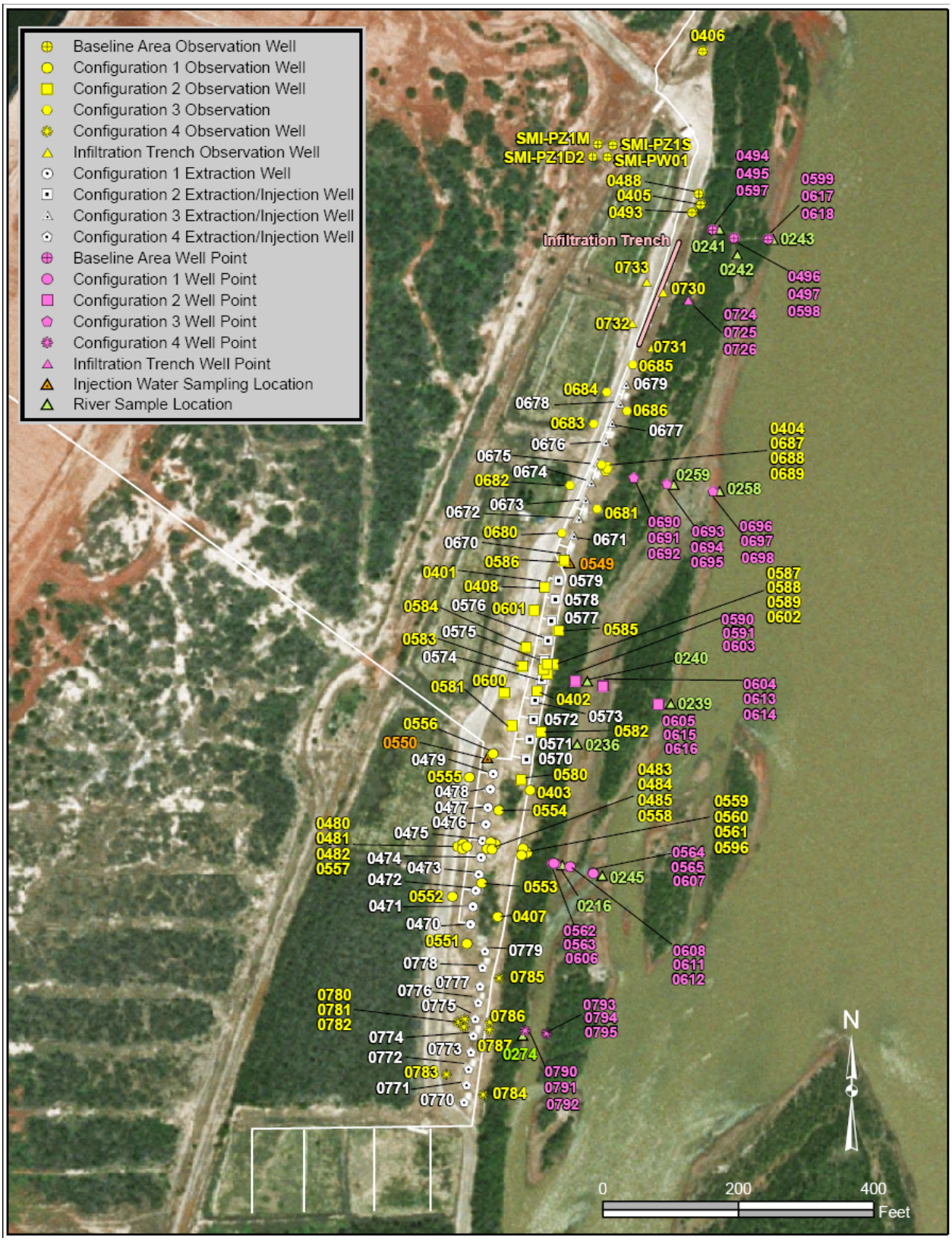


Figure 1. Map of Sample Locations at the IA Well Field and Baseline Area (includes locations not sampled)

Figure 2. September 2009 Sampling Event Site Conditions

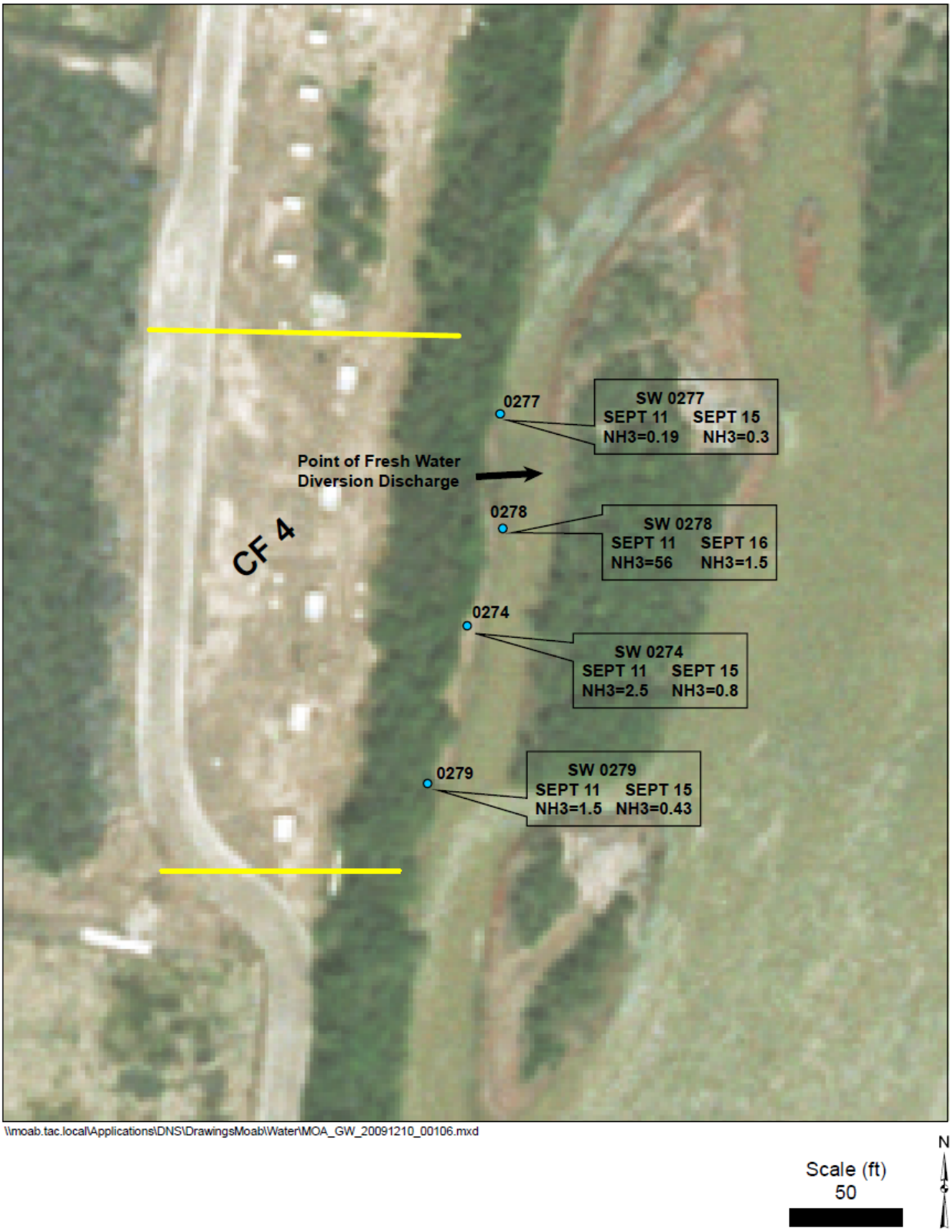


Figure 3. September 2009 CF4 Habitat Area Sampling Results

Baseline Area

Of the performance indicator wells, ground water samples were collected from only Baseline Area location 0493 (54 ft below ground surface [bgs]). Time versus concentration plots for ammonia, TDS, and uranium are presented as Figures 4, 5, and 6. These plots indicate concentrations in the sample collected from this depth were not impacted by the change in the river stage.

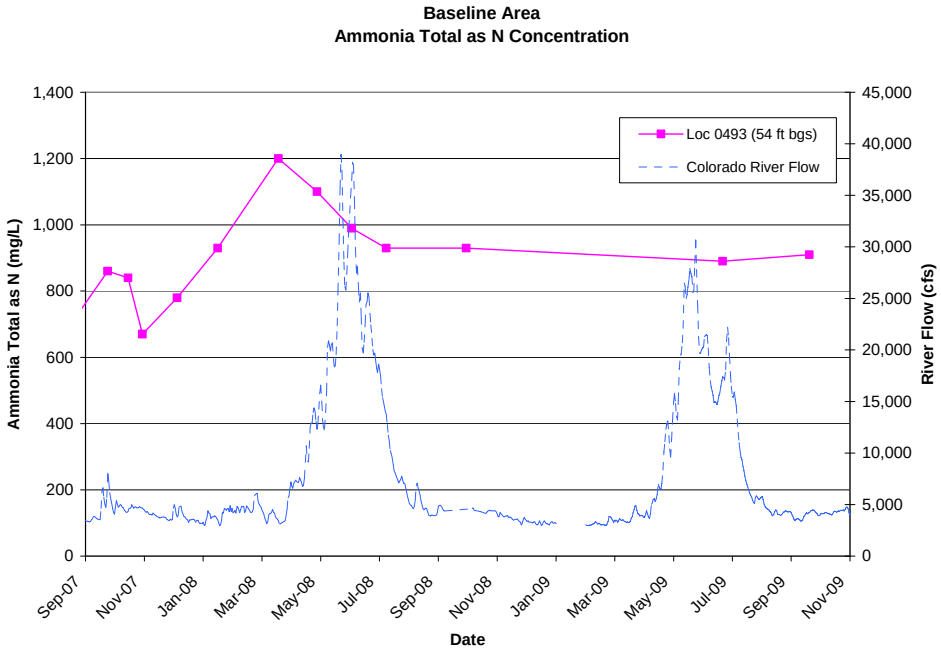


Figure 4. Baseline Area Observation Wells Time Versus Ammonia Total as N Concentration Plot

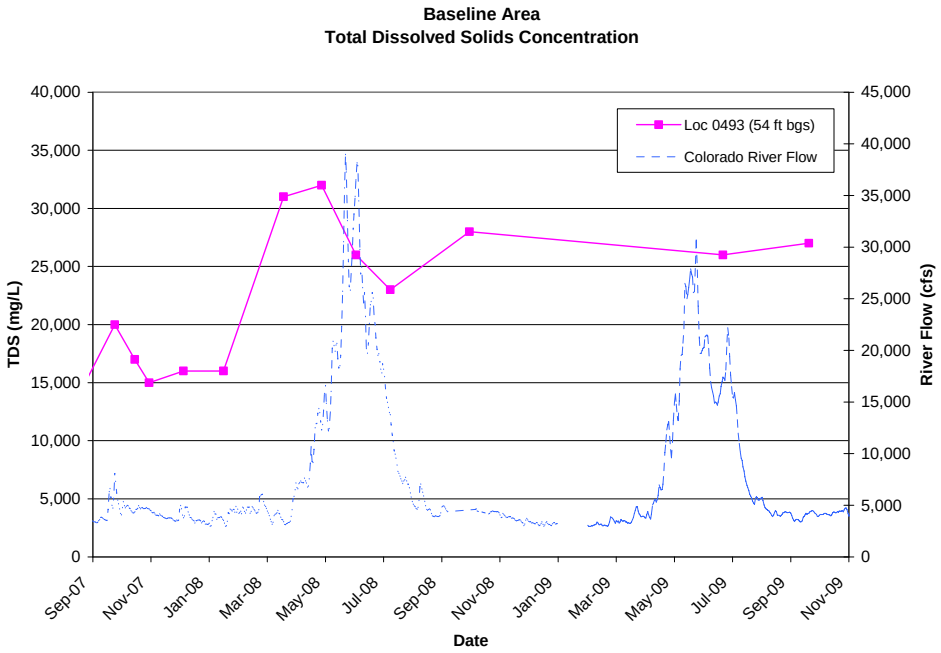


Figure 5. Baseline Area Observation Wells Time Versus TDS Concentration Plot

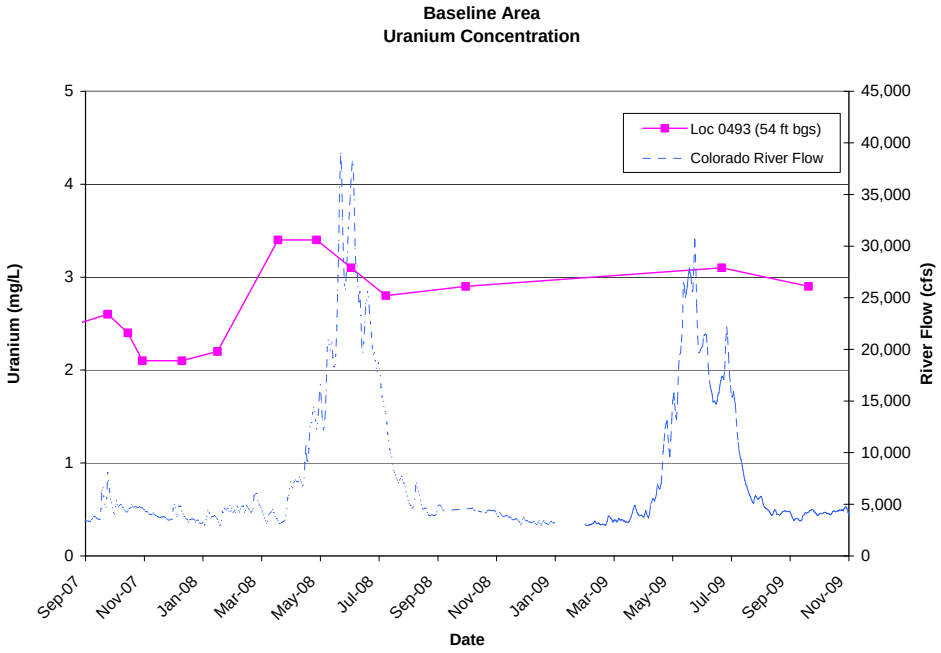


Figure 6. Baseline Area Observation Wells Time Versus Uranium Concentration Plot

CF3

Among the locations typically discussed in this section for CF3, samples were collected from 0683 (27 ft bgs), 0688 (31 ft bgs), and 0689 (46 ft bgs). A review of the time versus concentration plots (Figures 7, 8, and 9) suggest analyte concentrations generally rebounded to pre-runoff levels by September. The TDS plot (Figure 7) indicates the brine interface elevation in this portion of the well field increased during the 2009 spring runoff peak flows and rebounded by September 2009.

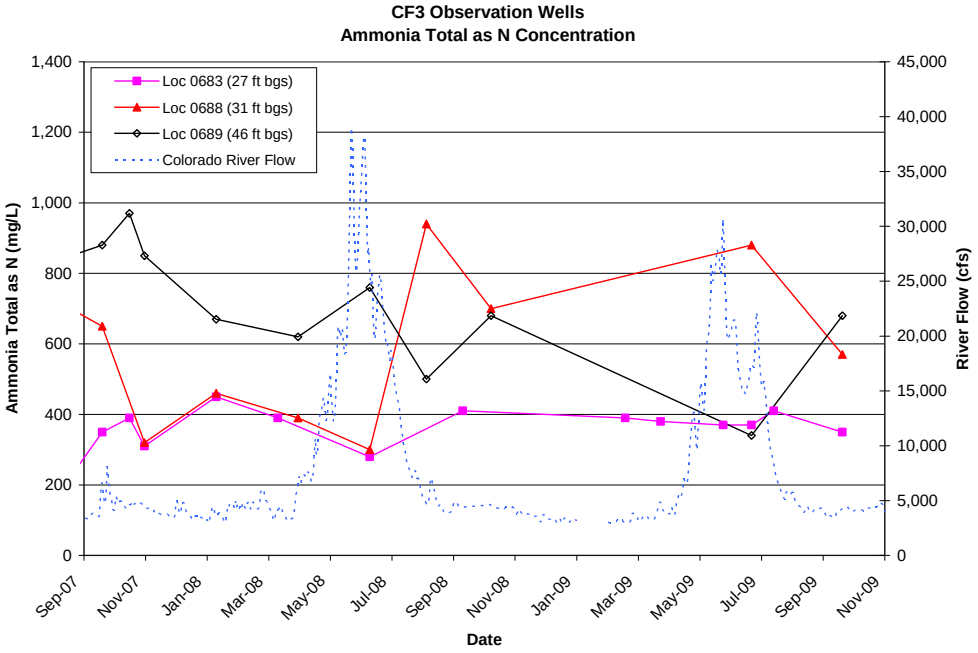


Figure 7. CF3 Observation Wells Time Versus Ammonia Total as N Concentration Plot

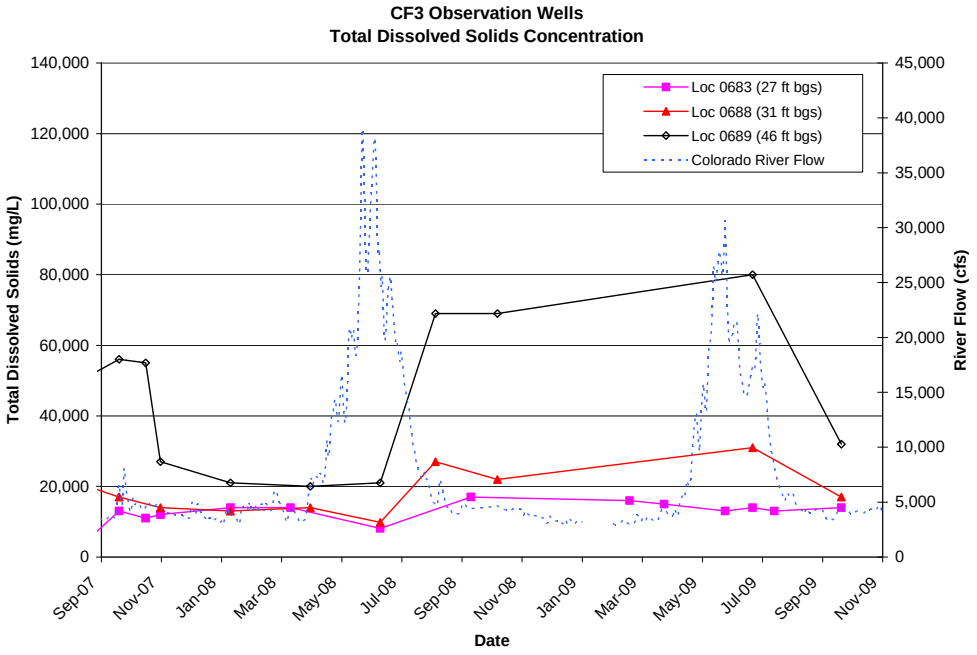


Figure 8. CF3 Observation Wells Time Versus TDS Concentration Plot

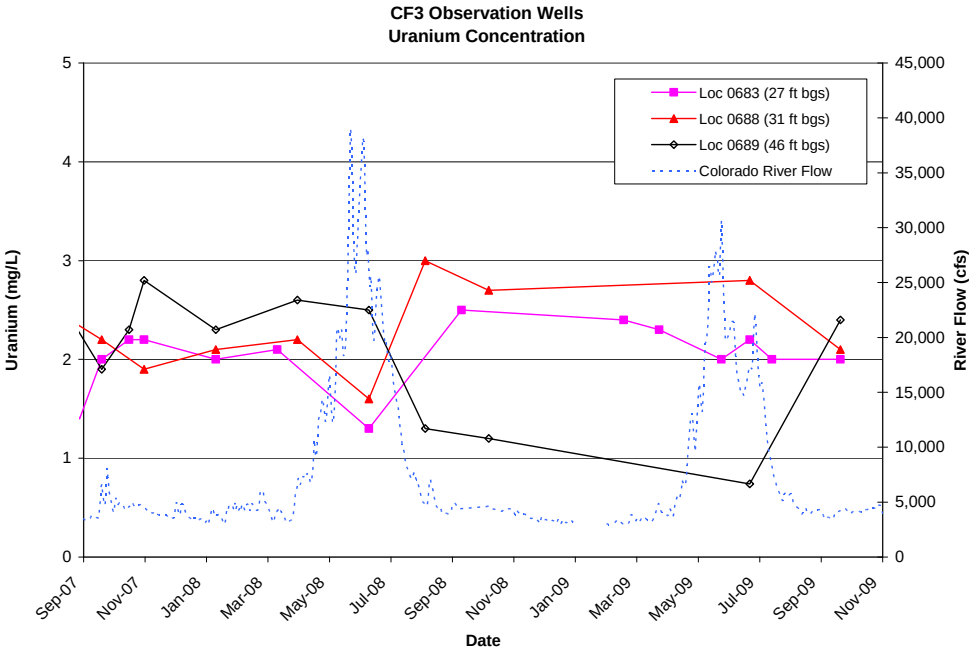


Figure 9. CF3 Observation Wells Time Versus Uranium Concentration Plot

CF2

Among the indicator wells, samples were collected only from 0588 (34 ft bgs) and 0589 (52 ft bgs) during this sampling event. The time versus ammonia (Figure 10), TDS (Figure 11), and uranium (Figure 12) concentration plots indicate these analyte concentrations generally rebounded to pre-runoff levels.

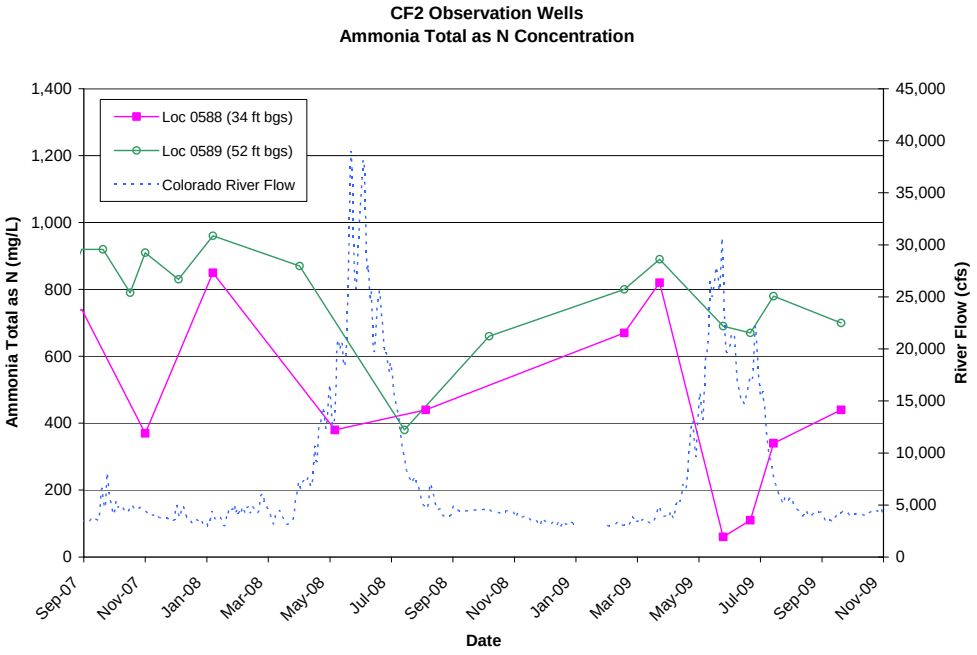


Figure 10. CF2 Observation Wells Time Versus Ammonia Total as N Concentration Plot

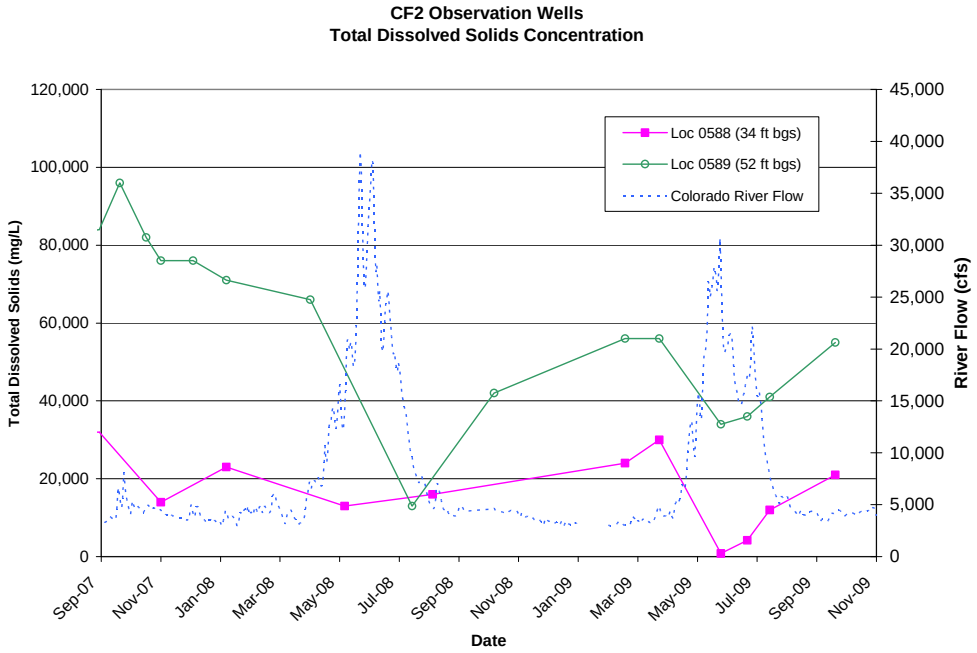


Figure 11. CF2 Observation Wells Time Versus TDS Concentration Plot

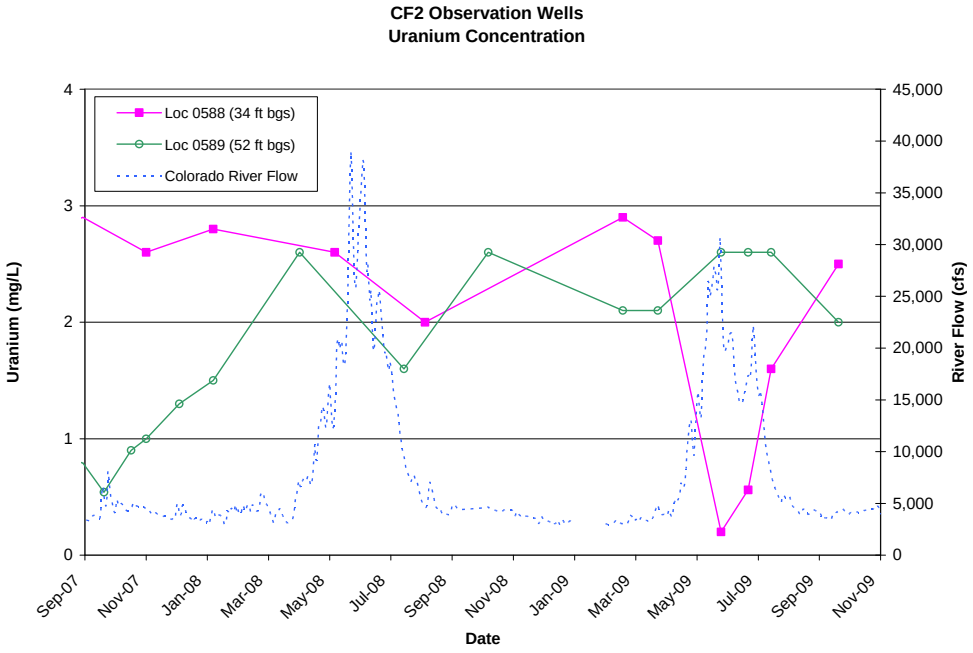


Figure 12. CF2 Observation Wells Time Versus Uranium Concentration Plot

CF1

Samples were collected from downgradient locations 0483 (from 18 ft bgs) and 0560 (from 31 ft bgs) and from upgradient location 0557 (40 ft bgs) during the September 2009 monthly sampling event. Changes in ammonia, TDS, and uranium concentrations (Figures 13, 14, and 15, respectively) exhibit the analyte concentrations all gradually increased since July 2009 regardless of the sample depth.

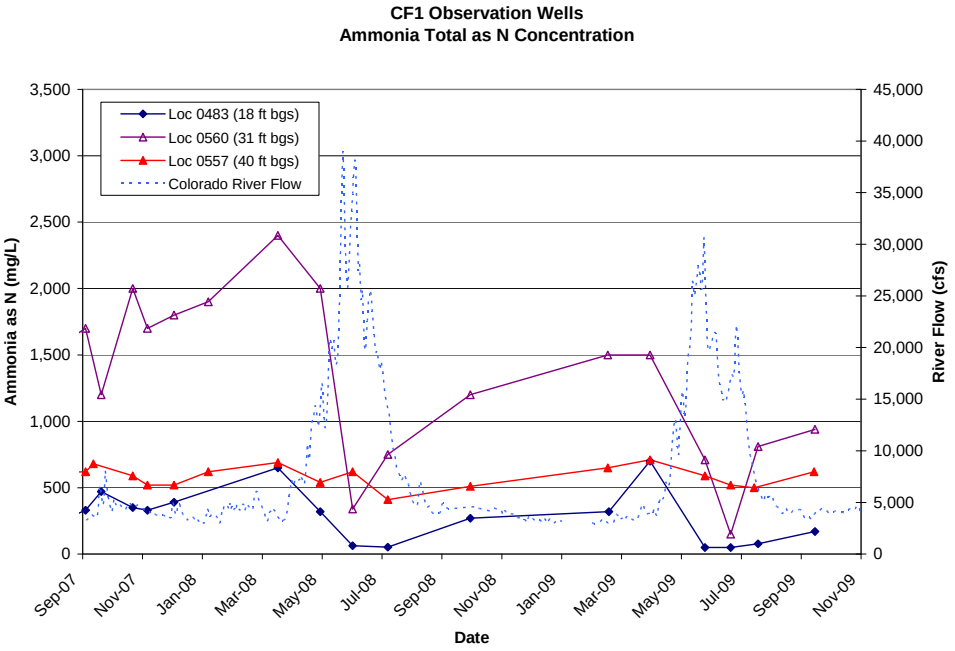


Figure 13. CF1 Observation Wells Time Versus Ammonia Total as N Concentration Plot

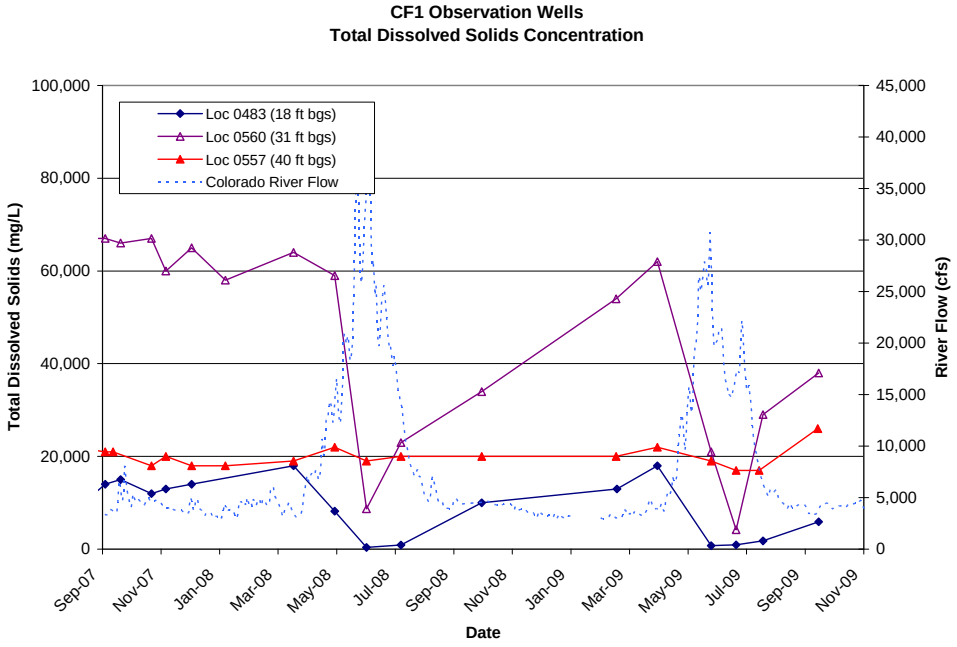


Figure 14. CF1 Observation Wells Time Versus TDS Concentration Plot

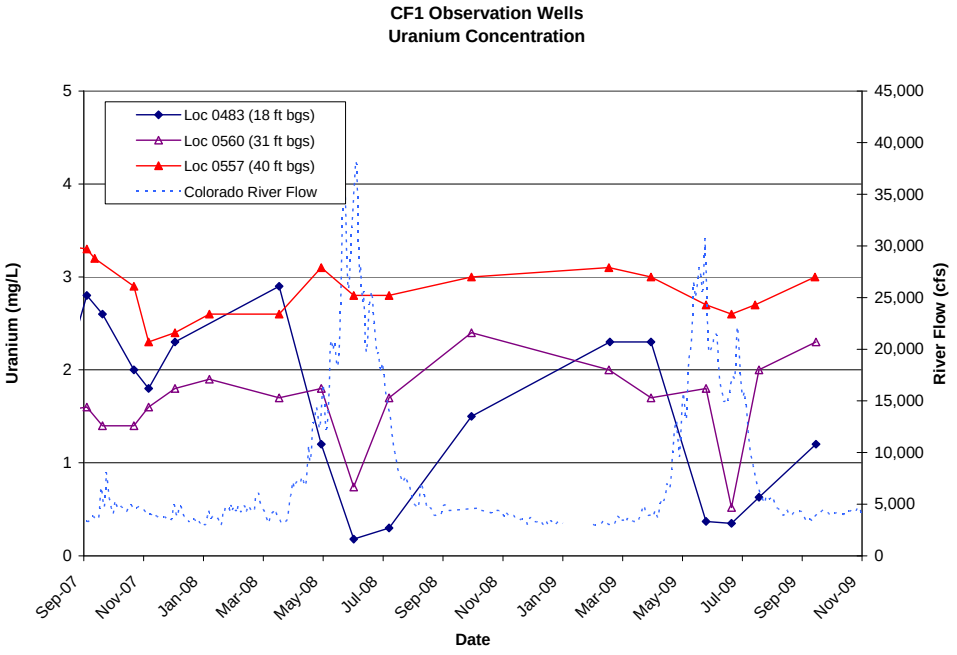


Figure 15. CF1 Observation Wells Time Versus Uranium Concentration Plot

CF1 Observation Wells 0403 and 0407

These locations are located along the river bank within CF1. As shown in the time versus analyte concentration plots (Figures 16, 17, and 18), the analyte concentrations in samples collected from both ends of CF1 started to rebound in a similar fashion compared to 2008.

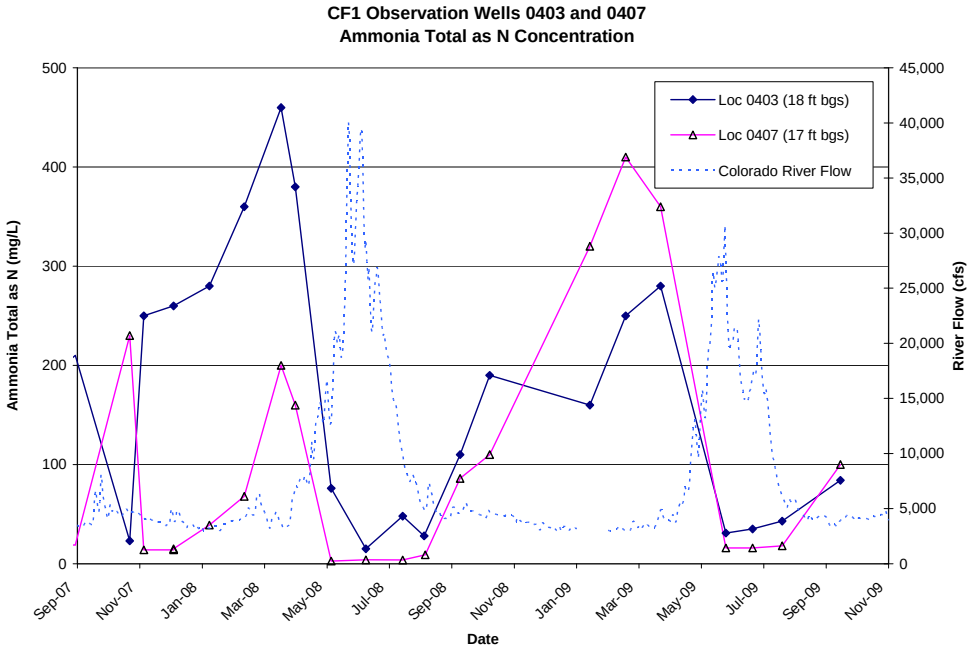


Figure 16. CF1 Observation Wells 0403 and 0407 Time Versus Ammonia Total as N Concentration Plot

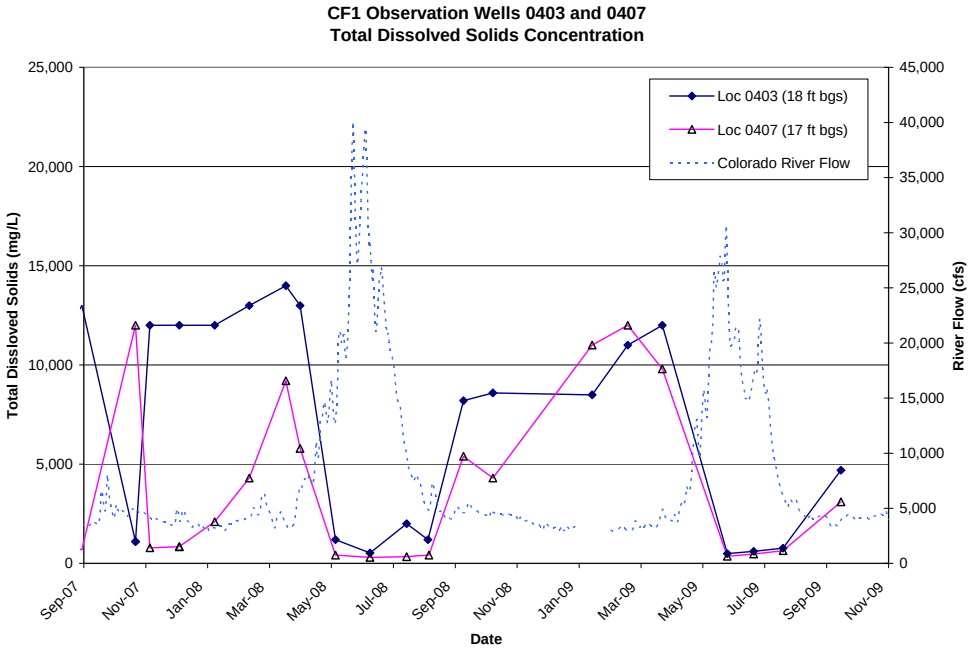


Figure 17. CF1 Observation Wells 0403 and 0407 Time Versus TDS Concentration Plot

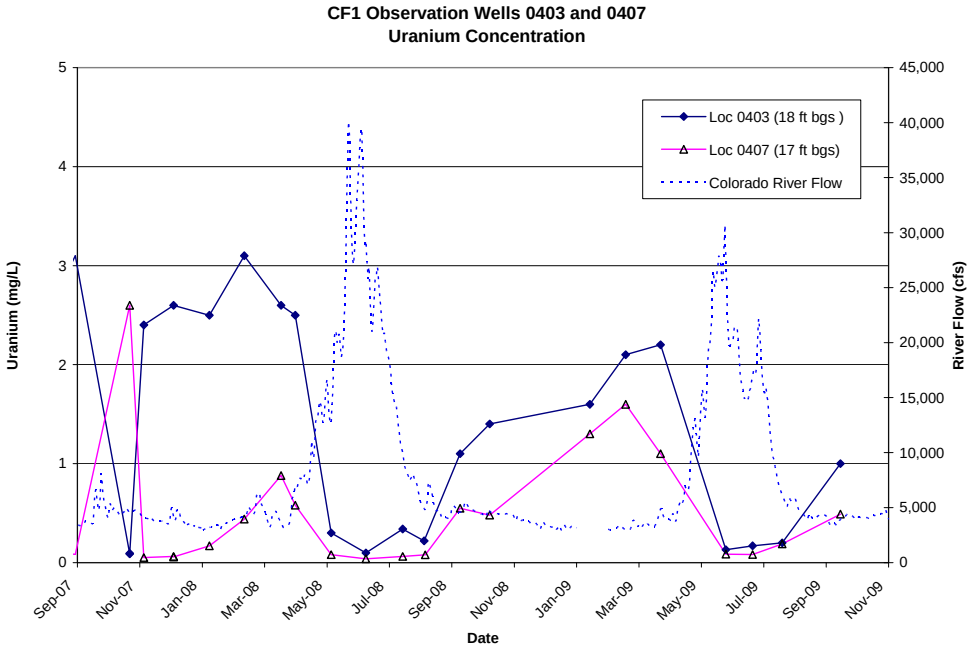


Figure 18. CF1 Observation Wells 0403 and 0407 Time Versus Uranium Concentration Plot

CF4

Of the indicator wells typically discussed in this summary for CF4, locations 0780 (28 ft bgs), 0786 (28 ft bgs), 0782 (33 ft bgs), and 0787 (36 ft bgs) were sampled during this sampling event. Ammonia, TDS, and uranium concentration trends over the past 2 years are displayed in Figures 19, 20, and 21, respectively. In general, analyte concentrations continued to rebound to pre-runoff levels in September 2009 in all four locations.

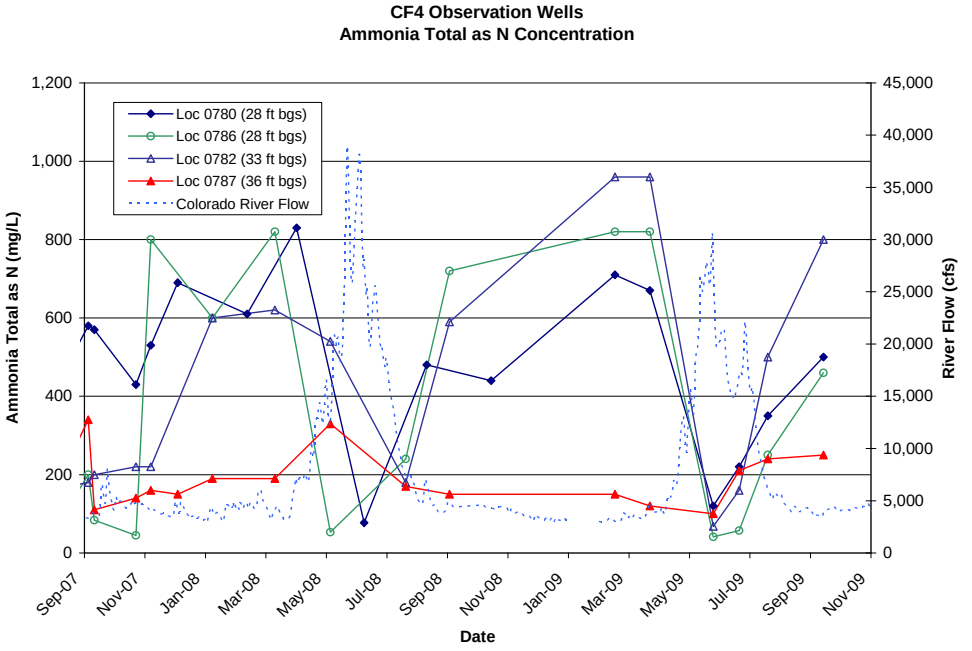


Figure 19. CF4 Observation Wells Time Versus Ammonia Total as N Concentration Plot

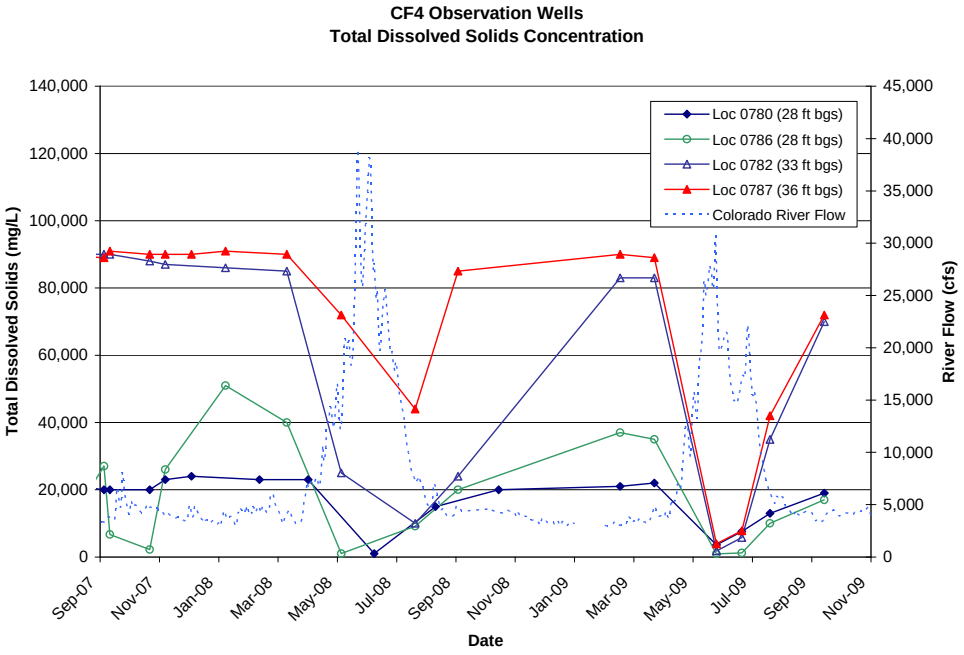


Figure 20. CF4 Observation Wells Time Versus TDS Concentration Plot

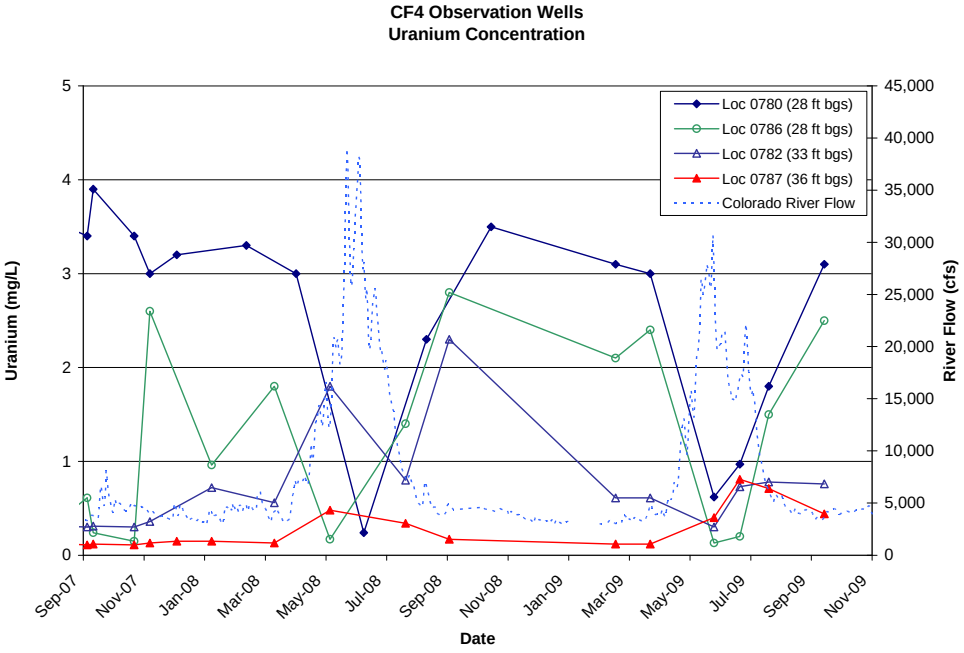


Figure 21. CF4 Observation Wells Time Versus Uranium Concentration Plot

Surface Water Sampling Results

Surface water samples were collected from four different CF4 locations (0274, 0277, 0278, and 0279) on two different dates (September 11 and 15) to measure the ammonia concentrations within the habitat area that developed on September 10 within the side channel off CF4. Ammonia concentrations were also measured using a HACH field probe. As a result of the elevated ammonia concentrations measured on September 11, freshwater (diverted Colorado River water) was applied to this habitat area. The area was resampled after application of this freshwater to flush out the habitat area to decrease the ammonia concentrations.

Analytical results are provided in Table 1. For comparison purposes, the applicable state of Utah and federal criteria for both acute and chronic concentrations (along with the temperature and pH data used to calculate these concentrations) is provided.

Table 1. September 2009 Sampling Event Surface Water Ammonia Concentrations and Comparisons to State of Utah and Federal Criteria

Location	Date	Temp (^{o}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]
0274	9/11/09	17.2	8.24	2.5	3.83	**1.43**
0274	9/15/09	16.5	8.19	0.8	3.83	1.63
0277	9/11/09	20.9	8.53	0.19	2.14	0.765
0277	9/15/09	17.2	7.56	0.3	11.4	3.49
0278	9/11/09	16.8	8.21	56	**3.83**	**1.63**
0278	9/16/09	16.7	8.21	1.5	3.83	1.63
0279	9/11/09	20.9	8.37	1.5	2.59	**0.906**
0279	9/15/09	16.8	8.21	0.43	3.83	1.63

AWQC = ambient water quality criteria; mg/L = milligrams per liter; Temp = temperature

(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, the surface water sample collected from location 0278 exceeded both the acute and chronic criteria on September 11, but did not exceed either criterion on September 16. Samples collected from locations 0274 and 0279 exceeded only the chronic criterion on September 11, but neither sample collected on September 15 exceeded the state of Utah acute or chronic criteria for ammonia.

Typically, all surface water sample results are also compared to the Uranium Mill Tailings Radiation Control Act drinking water standard for uranium; however; all surface water samples collected during this sampling event were analyzed only for ammonia.

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 all samples were collected using dedicated equipment; therefore, no equipment blanks (EBs) were required. 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, holding times, preservation, and cooler receipts, except as qualified or noted in the Laboratory Performance Assessment (Section 2.2).

There was only one anomalous data result associated with this sampling event, which was an historic low for manganese for location 0406. According to the USGS Cisco gauging station, the mean daily Colorado River flow rates varied between 3,490 and 4,540 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

Report Identification No. (RIN):	0909036
Sample Event:	September 2009 IA Well Field Monthly Sampling Event
Site(s):	Moab, Utah
Laboratory:	ALS Laboratory Group, Fort Collins, Colorado
Sample Data Group (SDG) Nos.:	0909120, 0909190, 0909249, and 0909255
Analysis:	Metals, Inorganics, Total Organic Carbon, Gross Alpha and Beta Activity
Validator:	Rachel Cowan
Review Date:	November 22, 2009

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 2.

Table 2. 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
Gross Alpha and Beta Activity	GPC-A-001	EPA 9310.1	EPA 9310.1
Manganese	G17	SW-846 3005A	SW-846 6010B
Nitrate as N	MIS-A-044	SW-846 9056	SW-846 9056
Orthophosphate as P	MIS-A-043	SW-846 9056	SW-846 9056
Sulfate	MIS-A-044	SW-846 9056	SW-846 9056
TDS	WIC-A-033	EPA 160.1	EPA 160.1
Total Organic Carbon	WCH-A-025	EPA 415.1	EPA 415.1
Selenium	G14	SW-846 3005A	SW-846 6020A
Uranium	G1	SW-846 3005A	SW-846 6020A

Data Qualifier Summary

Analytical results were qualified as listed in Table 3. Refer to Table 4 for an explanation of the data qualifiers applied.

Table 3. Data Qualifiers

Sample Number	Location	Analyte	Flag	Reason
All 0909190 samples	0274, 0277, 0278, 0279, 0403, 0407, 0480, 0483, 0557, 0559, 0560, 0671, 0673, 0675, 0677, 0679, 0780, 0782, 0786, 0787	All	J	P1
0909190-2 through -9, -19, -20; 0909249-2 through -9, -19	0277, 0278, 0279, 0403, 0407, 0480, 0483, 0557, 0786, 0787; 0471, 0473, 0475, 0477, 0479, 0493, 0547, 0583, 0778	Ammonia	J	MS1
All 0909255 samples	0537, 0800, 0801	Calcium, Iron, Nitrate, Orthophosphate, Sulfate	J	MS1, RS1
All 0909255 samples	0537, 0800, 0801	Calcium, Iron	J	SD1
All 0909255 samples	0537, 0800, 0801	Total Organic Carbon	J	MS1
All 0909255 samples	0537, 0800, 0801	Manganese, Uranium	J	MS1, SD1
All 0909255 samples	0537, 0800, 0801	Calcium, Iron, Manganese, Uranium	J	LCS1

J indicates results are estimated and becomes a UJ for analytical results below the detection limit.

Table 4. Reason Codes for Data Flags

Reason Code	Qualifier (Detects)	Qualifier (Nondetects)	Explanation
LCS1	J	UJ	A laboratory control sample was not analyzed at the proper frequency.
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.
P1	J	J or R	Samples received outside of the temperature criteria.
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 50 samples for RIN 0909036 in four shipments, which arrived on September 12, 2009 (SDG 0909120; UPS tracking number 1Z5W1Y51449837), September 18, 2009 (SDG 0909190; UPS tracking number 1Z5W1Y510192446442), and September 24, 2009 (SDG 0909190; UPS tracking number 1Z5W1Y510196121419; and SDG 0909255; UPS tracking number 1Z5W1Y510191883267). The sample groups were 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

SDGs 0909120, 0909190, 0909249, and 0909255 were received intact in four coolers with temperatures of 0.2°C (SDG 0909120), 4.6°C (SDG 0909190), 2.6°C (SDG 0909249), and 1.8°C (SDG 0909255). The temperature for SDG 0909190 cooler exceeded temperature requirements, so all SDG 0909190 results were "J"-flagged for reason P1. All samples were received in the correct container types and had been preserved correctly for the requested analyses, except 0909249-17, which had a pH of 2.5 (preservation requirements for metals is a pH of less than 2.0). ALS Laboratory Group corrected the pH of this sample upon receipt, so it was not flagged. All samples were analyzed within the applicable holding times.

Case Narratives

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

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 SDGs 0909190 and 0909249 did not have the appropriate number of MS samples as per method requirements, so ammonia results from samples 0909190-2 through -9, -19, -20, 0909249-2 through -9, and -19 were "J"-flagged for MS1.

Method SW-846 9056, Nitrate as N, Orthophosphate as P, and Sulfate
There were no samples from SDG 0909255 selected for testing matrix-specific, quality-control samples. Therefore, there were no MSs or RSs for nitrate, orthophosphate, and sulfate, and all SDG 0909249 nitrate, orthophosphate, and sulfate results were flagged for MS1 and RS1.

Method SW-846 6010B, Calcium, Iron, Manganese
There were no samples from SDG 0909255 selected for testing matrix-specific, quality-control samples. Therefore, there were no MSs for calcium, iron, and manganese, so all SDG 0909249 calcium, iron, and manganese results were flagged for MS1. There were no RSs for calcium and iron in SDG 0909255, so these results were also flagged for RS1. The field duplicate RS passed for manganese, however, so manganese results were not flagged for RS1.

Method EPA 415.1, Total Organic Carbon
There were no samples from SDG 0909255 selected for testing matrix-specific, quality-control samples. Therefore, there were no MSs or RSs for total organic carbon, and all SDG 0909249 total organic carbon results were flagged for MS1 and RS1.

Method SW-846 6020A, Uranium
There were no samples from SDG 0909255 selected for testing matrix-specific, quality-control samples. Therefore, there were no MSs for uranium, and all SDG 0909249 uranium results were flagged for MS1. However, the field duplicate RS passed for uranium, so uranium results were not 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 exception.

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.

For SDG 0909255, no samples were selected for MS requirements, so all manganese and uranium results were flagged for reason 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 (IDL) (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-mass spectrometry SD data are evaluated when the concentration of the undiluted sample is greater than 100 times the reporting limit (RL). Inductively coupled plasma-atomic emission spectroscopy SD data are evaluated when the concentration of the undiluted sample is greater than 100 times the RL. All evaluated SD data were acceptable, with the following exception.

According to the case narratives, there were no SDs in SDG 0909255, so all SDG 0909255 calcium, iron, manganese, and uranium results were "J"-flagged for reason SD1.

Minimum Detectable Concentration
The minimum detectable concentration (MDC) is used for radiochemical measurements and is similar to the method detection limit or the IDL. The MDC is the level for which there is a 5 percent probability of reporting a false positive result for a sample containing no activity.

Method EPA 9310.1, Gross Alpha and Beta Activity
Due to sedimentation in the samples, ALS Laboratory Group could not meet the required MDCs. However, all samples had relatively high gross alpha and beta activity, so none were qualified.

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. Three duplicate samples were collected from locations 0589, 0772, and 0778 (0909249-11, -16, and -19, respectively) in the September 2009 monthly 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 RL.

EBs
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.

Six surface water samples were collected using dedicated equipment. As per procedure, no EBs needed to be collected and analyzed.

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

Electronic Data Deliverable File
The Electronic Data Deliverable (EDD) files arrived on September 15, 2009 (SDG 0909120), September 30 (SDGs 0909190 and 0909249), and on October 1, 2009 (SDG 0909255). 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. The metals case narrative for SDG 0909190 stated that only 16 samples had been received; however, all other parts of that SDG's EDD files showed the actual 20 samples.

2.3 Field Analyses/Activities

The following information summarizes the field analyses and activities for the September 2009 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 Check Sheet (Section 3.2), a table 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 was one analytical result that was considered anomalous based on the Minimums and Maximums Report.

Location Number	Analyte	Type of Anomaly	Disposition
0406	Managnese	Low	Fewer than 10 samples collected from location; still establishing range.

3.3 Water Quality Data

All water quality data are presented in Appendix C.

3.4 Water Level Data

All water level data are presented in Appendix D.

3.5 Blanks 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

Sampling Event / RIN	September 2009/RIN 0909036	**Date(s) of Water Sampling**	September 11-24, 2009
Date(s) of Verification	November 29, 2009	**Name of Verifier**	Rachel Cowan

		Response (Yes, No, NA)	Comments
1.	Is the Sampling Analysis Plan the primary document directing field procedures?	Yes	
	List other documents, standard operating procedures, instructions.	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?	Yes	
	Did the operational checks meet criteria?	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?	Yes	
	Did the water level stabilize prior to sampling?	Yes	
	Did pH, specific conductance, and turbidity measurements stabilize prior to sampling?	Yes	
	Was the flow rate less than 500 milliliters per minute?	Yes	
	If a portable pump was used, was there a 4-hour delay between pump installation and sampling?	NA	

Appendix A. Water Sampling Field Activities Verification (continued)

	Response (Yes, No, NA)	Comments
8. Were the following conditions met when purging a Category II well:		
Was the flow rate less than 500 milliliters per minute?	Yes	
Was one pump/tubing volume removed prior to sampling?	Yes	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	There were 50 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	
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: 0909036
Comparison: All Historical Data
Report Date: 11/22/2009

				Current			Historical Maximum			Historical Minimum			Count	
					Qualifiers			Qualifiers			Qualifiers			
Site Code	Location Code	Sample Date	Analyte	Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect
MOA01	0406	09/21/2009	Ammonia Total as N	200			510			210		J	16	0
MOA01	0406	09/21/2009	Manganese	0.26			3.4		F	0.64			6	0
MOA01	0406	09/21/2009	Total Dissolved Solids	6200			12000		F	7300			15	0
MOA01	0406	09/21/2009	Uranium	0.96			2.2		F	1.1		F	16	0
MOA01	0477	09/21/2009	Ammonia Total as N	90		J	1200		F	100			49	0
MOA01	0537	09/24/2009	Ammonia Total as N	3400			16847.826		Q	5300			6	0
MOA01	0537	09/24/2009	Sulfate	33000		J	241000		Q	51000			6	0
MOA01	0537	09/24/2009	Total Dissolved Solids	48000			216000		Q	68000			5	0
MOA01	0537	09/24/2009	Uranium	3.6		J	15.3		Q	6.2			6	0
MOA01	0547	09/22/2009	Manganese	5.2			4.9			2.5		J	24	0
MOA01	0557	09/15/2009	Manganese	6.4		J	6.3			4.6			24	0
MOA01	0583	09/21/2009	Manganese	0.52			5.3		J	0.85			21	0
MOA01	0583	09/21/2009	Total Dissolved Solids	1600			17000			1900			46	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.

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

Appendix B. Minimums and Maximums Report (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 IDL 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: 12/3/2009

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	0274	SL	09/11/2009	0001	0.17	-	0.17	2.5			#	0.1	
Ammonia Total as N	mg/L	0274	SL	09/15/2009	0001	0.25	-	0.25	0.8		J	#	0.1	
Ammonia Total as N	mg/L	0277	SL	09/11/2009	0001	0.25	-	0.25	0.19			#	0.1	
Ammonia Total as N	mg/L	0277	SL	09/15/2009	0001	0.33	-	0.33	0.3		J	#	0.1	
Ammonia Total as N	mg/L	0278	SL	09/11/2009	0001	0.17	-	0.17	56			#	10	
Ammonia Total as N	mg/L	0278	SL	09/16/2009	0001	0.25	-	0.25	1.5		J	#	0.1	
Ammonia Total as N	mg/L	0279	SL	09/11/2009	0001	0.25	-	0.25	1.5			#	0.1	
Ammonia Total as N	mg/L	0279	SL	09/15/2009	0001	0.33	-	0.33	0.43		J	#	0.1	
Ammonia Total as N	mg/L	0403	WL	09/16/2009	0001	18	-	18	84		J	#	10	
Ammonia Total as N	mg/L	0406	WL	09/21/2009	0001	18	-	18	200			#	10	
Ammonia Total as N	mg/L	0407	WL	09/16/2009	0001	17	-	17	100		J	#	10	
Ammonia Total as N	mg/L	0471	WL	09/21/2009	0001	10.3	-	19.7	310		J	#	10	
Ammonia Total as N	mg/L	0473	WL	09/21/2009	0001	10.3	-	19.7	140		J	#	10	
Ammonia Total as N	mg/L	0475	WL	09/21/2009	0001	10.3	-	19.7	140		J	#	10	
Ammonia Total as N	mg/L	0477	WL	09/21/2009	0001	10.3	-	19.7	90		J	#	10	
Ammonia Total as N	mg/L	0479	WL	09/21/2009	0001	9.3	-	23.6	180		J	#	10	
Ammonia Total as N	mg/L	0480	WL	09/16/2009	0001	18	-	18	120		J	#	10	
Ammonia Total as N	mg/L	0483	WL	09/16/2009	0001	18	-	18	170		J	#	10	
Ammonia Total as N	mg/L	0493	WL	09/21/2009	0001	54	-	54	910		J	#	20	
Ammonia Total as N	mg/L	0537	TS	09/24/2009	0001	0	-	0	3400			#	100	
Ammonia Total as N	mg/L	0547	TS	09/22/2009	0001	0	-	0	470		J	#	10	
Ammonia Total as N	mg/L	0557	WL	09/15/2009	0001	40	-	40	620		J	#	20	
Ammonia Total as N	mg/L	0559	WL	09/16/2009	0001	19	-	19	110		J	#	10	
Ammonia Total as N	mg/L	0560	WL	09/16/2009	0001	31	-	31	940		J	#	50	
Ammonia Total as N	mg/L	0583	WL	09/21/2009	0001	18	-	18	68		J	#	10	
Ammonia Total as N	mg/L	0588	WL	09/21/2009	0001	34	-	34	440			#	10	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/3/2009

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	0589	WL	09/21/2009	0001	52	-	52	680			#	20	
Ammonia Total as N	mg/L	0589	WL	09/21/2009	0002	52	-	52	700			#	20	
Ammonia Total as N	mg/L	0671	WL	09/17/2009	0001	14.4	-	44.4	450		J	#	10	
Ammonia Total as N	mg/L	0673	WL	09/17/2009	0001	16.3	-	46.3	580		J	#	20	
Ammonia Total as N	mg/L	0675	WL	09/17/2009	0001	16	-	46	500		J	#	10	
Ammonia Total as N	mg/L	0677	WL	09/17/2009	0001	15.2	-	45.2	490		J	#	20	
Ammonia Total as N	mg/L	0679	WL	09/17/2009	0001	15	-	45	470		J	#	10	
Ammonia Total as N	mg/L	0683	WL	09/21/2009	0001	27	-	27	350			#	10	
Ammonia Total as N	mg/L	0688	WL	09/21/2009	0001	31	-	31	570			#	20	
Ammonia Total as N	mg/L	0689	WL	09/21/2009	0001	46	-	46	680			#	20	
Ammonia Total as N	mg/L	0770	WL	09/22/2009	0001	14.9	-	34.8	300			#	10	
Ammonia Total as N	mg/L	0772	WL	09/22/2009	0001	15.15	-	35.05	310			#	10	
Ammonia Total as N	mg/L	0772	WL	09/22/2009	0002	15.15	-	35.05	300			#	10	
Ammonia Total as N	mg/L	0775	WL	09/22/2009	0001	15.1	-	35	470			#	10	
Ammonia Total as N	mg/L	0776	WL	09/22/2009	0001	15.15	-	35.05	490			#	20	
Ammonia Total as N	mg/L	0778	WL	09/22/2009	0001	15.1	-	35	410		J	#	10	
Ammonia Total as N	mg/L	0778	WL	09/22/2009	0002	15.1	-	35	380			#	10	
Ammonia Total as N	mg/L	0780	WL	09/15/2009	0001	28	-	28	500		J	#	10	
Ammonia Total as N	mg/L	0782	WL	09/15/2009	0001	33	-	33	800		J	#	50	
Ammonia Total as N	mg/L	0786	WL	09/15/2009	0001	28	-	28	460		J	#	20	
Ammonia Total as N	mg/L	0787	WL	09/15/2009	0001	36	-	36	250		J	#	10	
Ammonia Total as N	mg/L	0800	SW	09/24/2009	0001	0	-	0	18000			#	1000	
Ammonia Total as N	mg/L	0801	SW	09/24/2009	0001	0	-	0	17000			#	500	
Ammonia Total as N	mg/L	SMI-PW02	WL	09/22/2009	0001	20.04	-	60.04	610			#	20	
Calcium	mg/L	0537	TS	09/24/2009	0001	0	-	0	450		J	#	0.021	
Calcium	mg/L	0800	SW	09/24/2009	0001	0	-	0	590		J	#	0.021	
Calcium	mg/L	0801	SW	09/24/2009	0001	0	-	0	460		J	#	0.021	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/3/2009

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Copper	mg/L	0787	WL	09/15/2009	0001	36	-	36	0.11	B	J	#	0.036	
Dissolved Oxygen	mg/L	0274	SL	09/11/2009	0001	0.17	-	0.17	8.42			#		
Dissolved Oxygen	mg/L	0274	SL	09/15/2009	0001	0.25	-	0.25	8.45			#		
Dissolved Oxygen	mg/L	0277	SL	09/11/2009	0001	0.25	-	0.25	11.14			#		
Dissolved Oxygen	mg/L	0277	SL	09/15/2009	0001	0.33	-	0.33	8.57			#		
Dissolved Oxygen	mg/L	0278	SL	09/11/2009	0001	0.17	-	0.17	9.37			#		
Dissolved Oxygen	mg/L	0278	SL	09/16/2009	0001	0.25	-	0.25	8.3			#		
Dissolved Oxygen	mg/L	0279	SL	09/11/2009	0001	0.25	-	0.25	9.17			#		
Dissolved Oxygen	mg/L	0279	SL	09/15/2009	0001	0.33	-	0.33	8.3			#		
Dissolved Oxygen	mg/L	0403	WL	09/16/2009	0001	18	-	18	0.93			#		
Dissolved Oxygen	mg/L	0406	WL	09/21/2009	0001	18	-	18	-0.44			#		
Dissolved Oxygen	mg/L	0407	WL	09/16/2009	0001	17	-	17	0.74			#		
Dissolved Oxygen	mg/L	0471	WL	09/21/2009	0001	10.3	-	19.7	1.75			#		
Dissolved Oxygen	mg/L	0473	WL	09/21/2009	0001	10.3	-	19.7	1.96			#		
Dissolved Oxygen	mg/L	0475	WL	09/21/2009	0001	10.3	-	19.7	2.82			#		
Dissolved Oxygen	mg/L	0477	WL	09/21/2009	0001	10.3	-	19.7	3.19			#		
Dissolved Oxygen	mg/L	0479	WL	09/21/2009	0001	9.3	-	23.6	4.04			#		
Dissolved Oxygen	mg/L	0480	WL	09/16/2009	0001	18	-	18	0.46			#		
Dissolved Oxygen	mg/L	0483	WL	09/16/2009	0001	18	-	18	1.8			#		
Dissolved Oxygen	mg/L	0493	WL	09/21/2009	0001	54	-	54	-0.59			#		
Dissolved Oxygen	mg/L	0547	TS	09/22/2009	0001	0	-	0	3.17			#		
Dissolved Oxygen	mg/L	0557	WL	09/15/2009	0001	40	-	40	0.95			#		
Dissolved Oxygen	mg/L	0559	WL	09/16/2009	0001	19	-	19	0.99			#		
Dissolved Oxygen	mg/L	0560	WL	09/16/2009	0001	31	-	31	-0.31			#		
Dissolved Oxygen	mg/L	0583	WL	09/21/2009	0001	18	-	18	-0.02			#		
Dissolved Oxygen	mg/L	0588	WL	09/21/2009	0001	34	-	34	0.16			#		
Dissolved Oxygen	mg/L	0589	WL	09/21/2009	0001	52	-	52	0.09			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/3/2009

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Dissolved Oxygen	mg/L	0671	WL	09/17/2009	0001	14.4	-	44.4	3.17			#		
Dissolved Oxygen	mg/L	0673	WL	09/17/2009	0001	16.3	-	46.3	3.18			#		
Dissolved Oxygen	mg/L	0675	WL	09/17/2009	0001	16	-	46	2.38			#		
Dissolved Oxygen	mg/L	0677	WL	09/17/2009	0001	15.2	-	45.2	2.14			#		
Dissolved Oxygen	mg/L	0679	WL	09/17/2009	0001	15	-	45	3.65			#		
Dissolved Oxygen	mg/L	0683	WL	09/21/2009	0001	27	-	27	-0.06			#		
Dissolved Oxygen	mg/L	0688	WL	09/21/2009	0001	31	-	31	-0.19			#		
Dissolved Oxygen	mg/L	0689	WL	09/21/2009	0001	46	-	46	-13			#		
Dissolved Oxygen	mg/L	0770	WL	09/22/2009	0001	14.9	-	34.8	0.99			#		
Dissolved Oxygen	mg/L	0772	WL	09/22/2009	0001	15.15	-	35.05	2.37			#		
Dissolved Oxygen	mg/L	0775	WL	09/22/2009	0001	15.1	-	35	1.88			#		
Dissolved Oxygen	mg/L	0776	WL	09/22/2009	0001	15.15	-	35.05	2.55			#		
Dissolved Oxygen	mg/L	0778	WL	09/22/2009	0001	15.1	-	35	2.11			#		
Dissolved Oxygen	mg/L	0780	WL	09/15/2009	0001	28	-	28	0.08			#		
Dissolved Oxygen	mg/L	0782	WL	09/15/2009	0001	33	-	33	0.65			#		
Dissolved Oxygen	mg/L	0786	WL	09/15/2009	0001	28	-	28	1.23			#		
Dissolved Oxygen	mg/L	0787	WL	09/15/2009	0001	36	-	36	0.75			#		
Dissolved Oxygen	mg/L	SMI-PW02	WL	09/22/2009	0001	20.04	-	60.04	1.36			#		
Gross Alpha	pCi/L	0537	TS	09/24/2009	0001	0	-	0	2420	M3		#	70	410
Gross Alpha	pCi/L	0800	SW	09/24/2009	0001	0	-	0	207000	M3		#	0	33000
Gross Alpha	pCi/L	0801	SW	09/24/2009	0001	0	-	0	103000	M3		#	0	17000
Gross Beta	pCi/L	0537	TS	09/24/2009	0001	0	-	0	720	M3		#	100	140
Gross Beta	pCi/L	0800	SW	09/24/2009	0001	0	-	0	15800	M3		#	1500	2700
Gross Beta	pCi/L	0801	SW	09/24/2009	0001	0	-	0	7000	M3		#	1200	1400
Iron	mg/L	0537	TS	09/24/2009	0001	0	-	0	52		J	#	0.016	
Iron	mg/L	0800	SW	09/24/2009	0001	0	-	0	1800		J	#	0.016	
Iron	mg/L	0801	SW	09/24/2009	0001	0	-	0	3900		J	#	0.16	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/3/2009

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	0403	WL	09/16/2009	0001	18	-	18	2.2		J	#	0.00052	
Manganese	mg/L	0406	WL	09/21/2009	0001	18	-	18	0.26			#	0.00052	
Manganese	mg/L	0407	WL	09/16/2009	0001	17	-	17	1.4		J	#	0.00021	
Manganese	mg/L	0471	WL	09/21/2009	0001	10.3	-	19.7	2.9			#	0.00052	
Manganese	mg/L	0473	WL	09/21/2009	0001	10.3	-	19.7	2.1			#	0.00052	
Manganese	mg/L	0475	WL	09/21/2009	0001	10.3	-	19.7	1.9			#	0.00052	
Manganese	mg/L	0477	WL	09/21/2009	0001	10.3	-	19.7	1.6			#	0.00052	
Manganese	mg/L	0479	WL	09/21/2009	0001	9.3	-	23.6	1.8			#	0.00052	
Manganese	mg/L	0480	WL	09/16/2009	0001	18	-	18	1.7		J	#	0.00021	
Manganese	mg/L	0483	WL	09/16/2009	0001	18	-	18	2.2		J	#	0.00052	
Manganese	mg/L	0493	WL	09/21/2009	0001	54	-	54	8.4			#	0.0026	
Manganese	mg/L	0537	TS	09/24/2009	0001	0	-	0	51		J	#	0.001	
Manganese	mg/L	0547	TS	09/22/2009	0001	0	-	0	5.2			#	0.0026	
Manganese	mg/L	0557	WL	09/15/2009	0001	40	-	40	6.4		J	#	0.001	
Manganese	mg/L	0559	WL	09/16/2009	0001	19	-	19	1.7		J	#	0.00021	
Manganese	mg/L	0560	WL	09/16/2009	0001	31	-	31	6.1		J	#	0.0052	
Manganese	mg/L	0583	WL	09/21/2009	0001	18	-	18	0.52			#	0.0001	
Manganese	mg/L	0588	WL	09/21/2009	0001	34	-	34	4.5			#	0.001	
Manganese	mg/L	0589	WL	09/21/2009	0001	52	-	52	8.6			#	0.0052	
Manganese	mg/L	0589	WL	09/21/2009	0002	52	-	52	7.7			#	0.0052	
Manganese	mg/L	0671	WL	09/17/2009	0001	14.4	-	44.4	4.7		J	#	0.0026	
Manganese	mg/L	0673	WL	09/17/2009	0001	16.3	-	46.3	5.7		J	#	0.0052	
Manganese	mg/L	0675	WL	09/17/2009	0001	16	-	46	5.4		J	#	0.0026	
Manganese	mg/L	0677	WL	09/17/2009	0001	15.2	-	45.2	5.1		J	#	0.0026	
Manganese	mg/L	0679	WL	09/17/2009	0001	15	-	45	4.6		J	#	0.0026	
Manganese	mg/L	0683	WL	09/21/2009	0001	27	-	27	5.1			#	0.001	
Manganese	mg/L	0688	WL	09/21/2009	0001	31	-	31	3.7			#	0.001	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/3/2009

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	0689	WL	09/21/2009	0001	46	-	46	5.3			#	0.0052	
Manganese	mg/L	0770	WL	09/22/2009	0001	14.9	-	34.8	4			#	0.0026	
Manganese	mg/L	0772	WL	09/22/2009	0001	15.15	-	35.05	4.9			#	0.0026	
Manganese	mg/L	0772	WL	09/22/2009	0002	15.15	-	35.05	5			#	0.0026	
Manganese	mg/L	0775	WL	09/22/2009	0001	15.1	-	35	5.9			#	0.0026	
Manganese	mg/L	0776	WL	09/22/2009	0001	15.15	-	35.05	5			#	0.0026	
Manganese	mg/L	0778	WL	09/22/2009	0001	15.1	-	35	3.7			#	0.0026	
Manganese	mg/L	0778	WL	09/22/2009	0002	15.1	-	35	3.4			#	0.0026	
Manganese	mg/L	0780	WL	09/15/2009	0001	28	-	28	6		J	#	0.0026	
Manganese	mg/L	0782	WL	09/15/2009	0001	33	-	33	8		J	#	0.0052	
Manganese	mg/L	0786	WL	09/15/2009	0001	28	-	28	5.6		J	#	0.0026	
Manganese	mg/L	0787	WL	09/15/2009	0001	36	-	36	6.4		J	#	0.0052	
Manganese	mg/L	0800	SW	09/24/2009	0001	0	-	0	560		J	#	0.01	
Manganese	mg/L	0801	SW	09/24/2009	0001	0	-	0	520		J	#	0.01	
Manganese	mg/L	SMI-PW02	WL	09/22/2009	0001	20.04	-	60.04	6.2			#	0.0052	
Nitrate as NO3	mg/L	0537	TS	09/24/2009	0001	0	-	0	820		J	#	10	
Nitrate as NO3	mg/L	0800	SW	09/24/2009	0001	0	-	0	9400		J	#	1000	
Nitrate as NO3	mg/L	0801	SW	09/24/2009	0001	0	-	0	1700		J	#	20	
Orthophosphate as Phosphorus	mg/L	0537	TS	09/24/2009	0001	0	-	0	25	UN	J	#	25	
Orthophosphate as Phosphorus	mg/L	0800	SW	09/24/2009	0001	0	-	0	50	U	J	#	50	
Orthophosphate as Phosphorus	mg/L	0801	SW	09/24/2009	0001	0	-	0	50	U	J	#	50	
Oxidation Reduction Potential	mV	0274	SL	09/11/2009	0001	0.17	-	0.17	172			#		
Oxidation Reduction Potential	mV	0274	SL	09/15/2009	0001	0.25	-	0.25	163			#		
Oxidation Reduction Potential	mV	0277	SL	09/11/2009	0001	0.25	-	0.25	147			#		
Oxidation Reduction Potential	mV	0277	SL	09/15/2009	0001	0.33	-	0.33	154			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/3/2009

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Oxidation Reduction Potential	mV	0278	SL	09/11/2009	0001	0.17	-	0.17	169			#		
Oxidation Reduction Potential	mV	0278	SL	09/16/2009	0001	0.25	-	0.25	163			#		
Oxidation Reduction Potential	mV	0279	SL	09/11/2009	0001	0.25	-	0.25	171.5			#		
Oxidation Reduction Potential	mV	0279	SL	09/15/2009	0001	0.33	-	0.33	160			#		
Oxidation Reduction Potential	mV	0403	WL	09/16/2009	0001	18	-	18	66.1			#		
Oxidation Reduction Potential	mV	0406	WL	09/21/2009	0001	18	-	18	133.1			#		
Oxidation Reduction Potential	mV	0407	WL	09/16/2009	0001	17	-	17	123.7			#		
Oxidation Reduction Potential	mV	0471	WL	09/21/2009	0001	10.3	-	19.7	209			#		
Oxidation Reduction Potential	mV	0473	WL	09/21/2009	0001	10.3	-	19.7	165			#		
Oxidation Reduction Potential	mV	0475	WL	09/21/2009	0001	10.3	-	19.7	171			#		
Oxidation Reduction Potential	mV	0477	WL	09/21/2009	0001	10.3	-	19.7	195.4			#		
Oxidation Reduction Potential	mV	0479	WL	09/21/2009	0001	9.3	-	23.6	2.19			#		
Oxidation Reduction Potential	mV	0480	WL	09/16/2009	0001	18	-	18	192			#		
Oxidation Reduction Potential	mV	0483	WL	09/16/2009	0001	18	-	18	158.8			#		
Oxidation Reduction Potential	mV	0493	WL	09/21/2009	0001	54	-	54	39.1			#		
Oxidation Reduction Potential	mV	0547	TS	09/22/2009	0001	0	-	0	175.3			#		
Oxidation Reduction Potential	mV	0557	WL	09/15/2009	0001	40	-	40	120.2			#		
Oxidation Reduction Potential	mV	0559	WL	09/16/2009	0001	19	-	19	161.5			#		
Oxidation Reduction Potential	mV	0560	WL	09/16/2009	0001	31	-	31	199.1			#		
Oxidation Reduction Potential	mV	0583	WL	09/21/2009	0001	18	-	18	163			#		
Oxidation Reduction Potential	mV	0588	WL	09/21/2009	0001	34	-	34	60			#		
Oxidation Reduction Potential	mV	0589	WL	09/21/2009	0001	52	-	52	100.5			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/3/2009

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Oxidation Reduction Potential	mV	0671	WL	09/17/2009	0001	14.4	-	44.4	236			#		
Oxidation Reduction Potential	mV	0673	WL	09/17/2009	0001	16.3	-	46.3	228.7			#		
Oxidation Reduction Potential	mV	0675	WL	09/17/2009	0001	16	-	46	222.9			#		
Oxidation Reduction Potential	mV	0677	WL	09/17/2009	0001	15.2	-	45.2	229.9			#		
Oxidation Reduction Potential	mV	0679	WL	09/17/2009	0001	15	-	45	180.4			#		
Oxidation Reduction Potential	mV	0683	WL	09/21/2009	0001	27	-	27	150.8			#		
Oxidation Reduction Potential	mV	0688	WL	09/21/2009	0001	31	-	31	74.5			#		
Oxidation Reduction Potential	mV	0689	WL	09/21/2009	0001	46	-	46	137.5			#		
Oxidation Reduction Potential	mV	0770	WL	09/22/2009	0001	14.9	-	34.8	211.1			#		
Oxidation Reduction Potential	mV	0772	WL	09/22/2009	0001	15.15	-	35.05	208.9			#		
Oxidation Reduction Potential	mV	0775	WL	09/22/2009	0001	15.1	-	35	190.3			#		
Oxidation Reduction Potential	mV	0776	WL	09/22/2009	0001	15.15	-	35.05	201.2			#		
Oxidation Reduction Potential	mV	0778	WL	09/22/2009	0001	15.1	-	35	210.8			#		
Oxidation Reduction Potential	mV	0780	WL	09/15/2009	0001	28	-	28	152.4			#		
Oxidation Reduction Potential	mV	0782	WL	09/15/2009	0001	33	-	33	215.2			#		
Oxidation Reduction Potential	mV	0786	WL	09/15/2009	0001	28	-	28	166.1			#		
Oxidation Reduction Potential	mV	0787	WL	09/15/2009	0001	36	-	36	175.9			#		
Oxidation Reduction Potential	mV	SMI-PW02	WL	09/22/2009	0001	20.04	-	60.04	201			#		
pH	s.u.	0274	SL	09/11/2009	0001	0.17	-	0.17	8.24			#		
pH	s.u.	0274	SL	09/15/2009	0001	0.25	-	0.25	8.19			#		
pH	s.u.	0277	SL	09/11/2009	0001	0.25	-	0.25	8.53			#		
pH	s.u.	0277	SL	09/15/2009	0001	0.33	-	0.33	7.56			#		
pH	s.u.	0278	SL	09/11/2009	0001	0.17	-	0.17	8.21			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/3/2009

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
pH	s.u.	0278	SL	09/16/2009	0001	0.25	-	0.25	8.21			#		
pH	s.u.	0279	SL	09/11/2009	0001	0.25	-	0.25	8.37			#		
pH	s.u.	0279	SL	09/15/2009	0001	0.33	-	0.33	8.21			#		
pH	s.u.	0403	WL	09/16/2009	0001	18	-	18	6.97			#		
pH	s.u.	0406	WL	09/21/2009	0001	18	-	18	7.2			#		
pH	s.u.	0407	WL	09/16/2009	0001	17	-	17	7.3			#		
pH	s.u.	0471	WL	09/21/2009	0001	10.3	-	19.7	7.03			#		
pH	s.u.	0473	WL	09/21/2009	0001	10.3	-	19.7	7.03			#		
pH	s.u.	0475	WL	09/21/2009	0001	10.3	-	19.7	7.01			#		
pH	s.u.	0477	WL	09/21/2009	0001	10.3	-	19.7	7.01			#		
pH	s.u.	0479	WL	09/21/2009	0001	9.3	-	23.6	7.06			#		
pH	s.u.	0480	WL	09/16/2009	0001	18	-	18	6.99			#		
pH	s.u.	0483	WL	09/16/2009	0001	18	-	18	7.1			#		
pH	s.u.	0493	WL	09/21/2009	0001	54	-	54	6.9			#		
pH	s.u.	0547	TS	09/22/2009	0001	0	-	0	7.11			#		
pH	s.u.	0557	WL	09/15/2009	0001	40	-	40	6.81			#		
pH	s.u.	0559	WL	09/16/2009	0001	19	-	19	7.13			#		
pH	s.u.	0560	WL	09/16/2009	0001	31	-	31	6.9			#		
pH	s.u.	0583	WL	09/21/2009	0001	18	-	18	7.37			#		
pH	s.u.	0588	WL	09/21/2009	0001	34	-	34	7.06			#		
pH	s.u.	0589	WL	09/21/2009	0001	52	-	52	6.87			#		
pH	s.u.	0671	WL	09/17/2009	0001	14.4	-	44.4	6.78			#		
pH	s.u.	0673	WL	09/17/2009	0001	16.3	-	46.3	6.75			#		
pH	s.u.	0675	WL	09/17/2009	0001	16	-	46	6.76			#		
pH	s.u.	0677	WL	09/17/2009	0001	15.2	-	45.2	6.82			#		
pH	s.u.	0679	WL	09/17/2009	0001	15	-	45	6.9			#		
pH	s.u.	0683	WL	09/21/2009	0001	27	-	27	6.85			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/3/2009

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
pH	s.u.	0688	WL	09/21/2009	0001	31	-	31	6.93			#		
pH	s.u.	0689	WL	09/21/2009	0001	46	-	46	6.94			#		
pH	s.u.	0770	WL	09/22/2009	0001	14.9	-	34.8	6.97			#		
pH	s.u.	0772	WL	09/22/2009	0001	15.15	-	35.05	6.91			#		
pH	s.u.	0775	WL	09/22/2009	0001	15.1	-	35	7			#		
pH	s.u.	0776	WL	09/22/2009	0001	15.15	-	35.05	7			#		
pH	s.u.	0778	WL	09/22/2009	0001	15.1	-	35	7.12			#		
pH	s.u.	0780	WL	09/15/2009	0001	28	-	28	6.81			#		
pH	s.u.	0782	WL	09/15/2009	0001	33	-	33	6.79			#		
pH	s.u.	0786	WL	09/15/2009	0001	28	-	28	6.92			#		
pH	s.u.	0787	WL	09/15/2009	0001	36	-	36	6.92			#		
pH	s.u.	SMI-PW02	WL	09/22/2009	0001	20.04	-	60.04	6.86			#		
Selenium	mg/L	0406	WL	09/21/2009	0001	18	-	18	0.0098	E		#	0.00016	
Selenium	mg/L	0683	WL	09/21/2009	0001	27	-	27	0.017			#	0.00016	
Specific Conductance	µmhos /cm	0274	SL	09/11/2009	0001	0.17	-	0.17	140.7			#		
Specific Conductance	µmhos /cm	0274	SL	09/15/2009	0001	0.25	-	0.25	1370			#		
Specific Conductance	µmhos /cm	0277	SL	09/11/2009	0001	0.25	-	0.25	1289			#		
Specific Conductance	µmhos /cm	0277	SL	09/15/2009	0001	0.33	-	0.33	1385			#		
Specific Conductance	µmhos /cm	0278	SL	09/11/2009	0001	0.17	-	0.17	1647			#		
Specific Conductance	µmhos /cm	0278	SL	09/16/2009	0001	0.25	-	0.25	1375			#		
Specific Conductance	µmhos /cm	0279	SL	09/11/2009	0001	0.25	-	0.25	1372			#		
Specific Conductance	µmhos /cm	0279	SL	09/15/2009	0001	0.33	-	0.33	1391			#		
Specific Conductance	µmhos /cm	0403	WL	09/16/2009	0001	18	-	18	6296			#		
Specific Conductance	µmhos /cm	0406	WL	09/21/2009	0001	18	-	18	10373			#		
Specific Conductance	µmhos /cm	0407	WL	09/16/2009	0001	17	-	17	4943			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/3/2009

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Specific Conductance	µmhos /cm	0471	WL	09/21/2009	0001	10.3	-	19.7	15426			#		
Specific Conductance	µmhos /cm	0473	WL	09/21/2009	0001	10.3	-	19.7	8550			#		
Specific Conductance	µmhos /cm	0475	WL	09/21/2009	0001	10.3	-	19.7	7774			#		
Specific Conductance	µmhos /cm	0477	WL	09/21/2009	0001	10.3	-	19.7	7572			#		
Specific Conductance	µmhos /cm	0479	WL	09/21/2009	0001	9.3	-	23.6	10190			#		
Specific Conductance	µmhos /cm	0480	WL	09/16/2009	0001	18	-	18	3950			#		
Specific Conductance	µmhos /cm	0483	WL	09/16/2009	0001	18	-	18	8373			#		
Specific Conductance	µmhos /cm	0493	WL	09/21/2009	0001	54	-	54	39657			#		
Specific Conductance	µmhos /cm	0547	TS	09/22/2009	0001	0	-	0	48320			#		
Specific Conductance	µmhos /cm	0557	WL	09/15/2009	0001	40	-	40	39590			#		
Specific Conductance	µmhos /cm	0559	WL	09/16/2009	0001	19	-	19	5950			#		
Specific Conductance	µmhos /cm	0560	WL	09/16/2009	0001	31	-	31	59519			#		
Specific Conductance	µmhos /cm	0583	WL	09/21/2009	0001	18	-	18	3028			#		
Specific Conductance	µmhos /cm	0588	WL	09/21/2009	0001	34	-	34	29127			#		
Specific Conductance	µmhos /cm	0589	WL	09/21/2009	0001	52	-	52	80444			#		
Specific Conductance	µmhos /cm	0671	WL	09/17/2009	0001	14.4	-	44.4	25629			#		
Specific Conductance	µmhos /cm	0673	WL	09/17/2009	0001	16.3	-	46.3	47440			#		
Specific Conductance	µmhos /cm	0675	WL	09/17/2009	0001	16	-	46	33458			#		
Specific Conductance	µmhos /cm	0677	WL	09/17/2009	0001	15.2	-	45.2	27669			#		
Specific Conductance	µmhos /cm	0679	WL	09/17/2009	0001	15	-	45	20971			#		
Specific Conductance	µmhos /cm	0683	WL	09/21/2009	0001	27	-	27	18234			#		
Specific Conductance	µmhos /cm	0688	WL	09/21/2009	0001	31	-	31	23930			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/3/2009

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Specific Conductance	µmhos /cm	0689	WL	09/21/2009	0001	46	-	46	46328			#		
Specific Conductance	µmhos /cm	0770	WL	09/22/2009	0001	14.9	-	34.8	31975			#		
Specific Conductance	µmhos /cm	0772	WL	09/22/2009	0001	15.15	-	35.05	30274			#		
Specific Conductance	µmhos /cm	0775	WL	09/22/2009	0001	15.1	-	35	27055			#		
Specific Conductance	µmhos /cm	0776	WL	09/22/2009	0001	15.15	-	35.05	35744			#		
Specific Conductance	µmhos /cm	0778	WL	09/22/2009	0001	15.1	-	35	26818			#		
Specific Conductance	µmhos /cm	0780	WL	09/15/2009	0001	28	-	28	26000			#		
Specific Conductance	µmhos /cm	0782	WL	09/15/2009	0001	33	-	33	108012			#		
Specific Conductance	µmhos /cm	0786	WL	09/15/2009	0001	28	-	28	25677			#		
Specific Conductance	µmhos /cm	0787	WL	09/15/2009	0001	36	-	36	110574			#		
Specific Conductance	µmhos /cm	SMI-PW02	WL	09/22/2009	0001	20.04	-	60.04	68444			#		
Sulfate	mg/L	0537	TS	09/24/2009	0001	0	-	0	33000		J	#	1000	
Sulfate	mg/L	0800	SW	09/24/2009	0001	0	-	0	120000		J	#	2500	
Sulfate	mg/L	0801	SW	09/24/2009	0001	0	-	0	170000		J	#	1000	
Temperature	C	0274	SL	09/11/2009	0001	0.17	-	0.17	17.16			#		
Temperature	C	0274	SL	09/15/2009	0001	0.25	-	0.25	16.5			#		
Temperature	C	0277	SL	09/11/2009	0001	0.25	-	0.25	20.9			#		
Temperature	C	0277	SL	09/15/2009	0001	0.33	-	0.33	17.24			#		
Temperature	C	0278	SL	09/11/2009	0001	0.17	-	0.17	16.81			#		
Temperature	C	0278	SL	09/16/2009	0001	0.25	-	0.25	16.68			#		
Temperature	C	0279	SL	09/11/2009	0001	0.25	-	0.25	20.87			#		
Temperature	C	0279	SL	09/15/2009	0001	0.33	-	0.33	16.78			#		
Temperature	C	0403	WL	09/16/2009	0001	18	-	18	16.04			#		
Temperature	C	0406	WL	09/21/2009	0001	18	-	18	17.53			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/3/2009

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Temperature	C	0407	WL	09/16/2009	0001	17	-	17	15.74			#		
Temperature	C	0471	WL	09/21/2009	0001	10.3	-	19.7	15.82			#		
Temperature	C	0473	WL	09/21/2009	0001	10.3	-	19.7	16.31			#		
Temperature	C	0475	WL	09/21/2009	0001	10.3	-	19.7	15.85			#		
Temperature	C	0477	WL	09/21/2009	0001	10.3	-	19.7	16.33			#		
Temperature	C	0479	WL	09/21/2009	0001	9.3	-	23.6	16.94			#		
Temperature	C	0480	WL	09/16/2009	0001	18	-	18	15.24			#		
Temperature	C	0483	WL	09/16/2009	0001	18	-	18	16.06			#		
Temperature	C	0493	WL	09/21/2009	0001	54	-	54	17.18			#		
Temperature	C	0547	TS	09/22/2009	0001	0	-	0	18.7			#		
Temperature	C	0557	WL	09/15/2009	0001	40	-	40	16.23			#		
Temperature	C	0559	WL	09/16/2009	0001	19	-	19	15.55			#		
Temperature	C	0560	WL	09/16/2009	0001	31	-	31	15.31			#		
Temperature	C	0583	WL	09/21/2009	0001	18	-	18	16.17			#		
Temperature	C	0588	WL	09/21/2009	0001	34	-	34	15.51			#		
Temperature	C	0589	WL	09/21/2009	0001	52	-	52	15.91			#		
Temperature	C	0671	WL	09/17/2009	0001	14.4	-	44.4	15.77			#		
Temperature	C	0673	WL	09/17/2009	0001	16.3	-	46.3	15.76			#		
Temperature	C	0675	WL	09/17/2009	0001	16	-	46	15.45			#		
Temperature	C	0677	WL	09/17/2009	0001	15.2	-	45.2	15.56			#		
Temperature	C	0679	WL	09/17/2009	0001	15	-	45	16.06			#		
Temperature	C	0683	WL	09/21/2009	0001	27	-	27	16.07			#		
Temperature	C	0688	WL	09/21/2009	0001	31	-	31	16.34			#		
Temperature	C	0689	WL	09/21/2009	0001	46	-	46	16.64			#		
Temperature	C	0770	WL	09/22/2009	0001	14.9	-	34.8	15.3			#		
Temperature	C	0772	WL	09/22/2009	0001	15.15	-	35.05	15.58			#		
Temperature	C	0775	WL	09/22/2009	0001	15.1	-	35	14.95			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/3/2009

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Temperature	C	0776	WL	09/22/2009	0001	15.15	-	35.05	15.16			#		
Temperature	C	0778	WL	09/22/2009	0001	15.1	-	35	15.22			#		
Temperature	C	0780	WL	09/15/2009	0001	28	-	28	16			#		
Temperature	C	0782	WL	09/15/2009	0001	33	-	33	15.96			#		
Temperature	C	0786	WL	09/15/2009	0001	28	-	28	15.52			#		
Temperature	C	0787	WL	09/15/2009	0001	36	-	36	16.34			#		
Temperature	C	SMI-PW02	WL	09/22/2009	0001	20.04	-	60.04	15.47			#		
Total Dissolved Solids	mg/L	0403	WL	09/16/2009	0001	18	-	18	4700			#	80	
Total Dissolved Solids	mg/L	0406	WL	09/21/2009	0001	18	-	18	6200			#	200	
Total Dissolved Solids	mg/L	0407	WL	09/16/2009	0001	17	-	17	3100			#	80	
Total Dissolved Solids	mg/L	0471	WL	09/21/2009	0001	10.3	-	19.7	9200			#	200	
Total Dissolved Solids	mg/L	0473	WL	09/21/2009	0001	10.3	-	19.7	4900			#	200	
Total Dissolved Solids	mg/L	0475	WL	09/21/2009	0001	10.3	-	19.7	4800			#	80	
Total Dissolved Solids	mg/L	0477	WL	09/21/2009	0001	10.3	-	19.7	4800			#	80	
Total Dissolved Solids	mg/L	0479	WL	09/21/2009	0001	9.3	-	23.6	6200			#	200	
Total Dissolved Solids	mg/L	0480	WL	09/16/2009	0001	18	-	18	2500			#	80	
Total Dissolved Solids	mg/L	0483	WL	09/16/2009	0001	18	-	18	5900			#	80	
Total Dissolved Solids	mg/L	0493	WL	09/21/2009	0001	54	-	54	27000			#	1000	
Total Dissolved Solids	mg/L	0537	TS	09/24/2009	0001	0	-	0	48000			#	1000	
Total Dissolved Solids	mg/L	0547	TS	09/22/2009	0001	0	-	0	28000			#	1000	
Total Dissolved Solids	mg/L	0557	WL	09/15/2009	0001	40	-	40	26000			#	400	
Total Dissolved Solids	mg/L	0559	WL	09/16/2009	0001	19	-	19	3900			#	80	
Total Dissolved Solids	mg/L	0560	WL	09/16/2009	0001	31	-	31	38000			#	2000	
Total Dissolved Solids	mg/L	0583	WL	09/21/2009	0001	18	-	18	1600			#	40	
Total Dissolved Solids	mg/L	0588	WL	09/21/2009	0001	34	-	34	21000			#	400	
Total Dissolved Solids	mg/L	0589	WL	09/21/2009	0001	52	-	52	54000			#	1000	
Total Dissolved Solids	mg/L	0589	WL	09/21/2009	0002	52	-	52	55000			#	2000	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/3/2009

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Total Dissolved Solids	mg/L	0671	WL	09/17/2009	0001	14.4	-	44.4	20000			#	1000	
Total Dissolved Solids	mg/L	0673	WL	09/17/2009	0001	16.3	-	46.3	32000			#	2000	
Total Dissolved Solids	mg/L	0675	WL	09/17/2009	0001	16	-	46	22000			#	1000	
Total Dissolved Solids	mg/L	0677	WL	09/17/2009	0001	15.2	-	45.2	19000			#	1000	
Total Dissolved Solids	mg/L	0679	WL	09/17/2009	0001	15	-	45	14000			#	400	
Total Dissolved Solids	mg/L	0683	WL	09/21/2009	0001	27	-	27	14000			#	400	
Total Dissolved Solids	mg/L	0688	WL	09/21/2009	0001	31	-	31	17000			#	400	
Total Dissolved Solids	mg/L	0689	WL	09/21/2009	0001	46	-	46	32000			#	2000	
Total Dissolved Solids	mg/L	0770	WL	09/22/2009	0001	14.9	-	34.8	19000			#	1000	
Total Dissolved Solids	mg/L	0772	WL	09/22/2009	0001	15.15	-	35.05	20000			#	400	
Total Dissolved Solids	mg/L	0772	WL	09/22/2009	0002	15.15	-	35.05	19000			#	1000	
Total Dissolved Solids	mg/L	0775	WL	09/22/2009	0001	15.1	-	35	18000			#	400	
Total Dissolved Solids	mg/L	0776	WL	09/22/2009	0001	15.15	-	35.05	21000			#	1000	
Total Dissolved Solids	mg/L	0778	WL	09/22/2009	0001	15.1	-	35	16000			#	400	
Total Dissolved Solids	mg/L	0778	WL	09/22/2009	0002	15.1	-	35	16000			#	400	
Total Dissolved Solids	mg/L	0780	WL	09/15/2009	0001	28	-	28	19000			#	1000	
Total Dissolved Solids	mg/L	0782	WL	09/15/2009	0001	33	-	33	70000			#	2000	
Total Dissolved Solids	mg/L	0786	WL	09/15/2009	0001	28	-	28	17000			#	1000	
Total Dissolved Solids	mg/L	0787	WL	09/15/2009	0001	36	-	36	72000			#	2000	
Total Dissolved Solids	mg/L	0800	SW	09/24/2009	0001	0	-	0	160000			#	8000	
Total Dissolved Solids	mg/L	0801	SW	09/24/2009	0001	0	-	0	240000			#	8000	
Total Dissolved Solids	mg/L	SMI-PW02	WL	09/22/2009	0001	20.04	-	60.04	42000			#	2000	
Total Organic Carbon	mg/L	0537	TS	09/24/2009	N001	0	-	0	17		J	#	4	
Total Organic Carbon	mg/L	0800	SW	09/24/2009	N001	0	-	0	2.4		J	#	1	
Total Organic Carbon	mg/L	0801	SW	09/24/2009	N001	0	-	0	27		J	#	8	
Turbidity	NTU	0274	SL	09/11/2009	0001	0.17	-	0.17	27.3			#		
Turbidity	NTU	0277	SL	09/11/2009	0001	0.25	-	0.25	110			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/3/2009

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Turbidity	NTU	0278	SL	09/11/2009	0001	0.17	-	0.17	23.9			#		
Turbidity	NTU	0279	SL	09/11/2009	0001	0.25	-	0.25	27.4			#		
Turbidity	NTU	0403	WL	09/16/2009	0001	18	-	18	0.75			#		
Turbidity	NTU	0406	WL	09/21/2009	0001	18	-	18	9.76			#		
Turbidity	NTU	0407	WL	09/16/2009	0001	17	-	17	1.12			#		
Turbidity	NTU	0471	WL	09/21/2009	0001	10.3	-	19.7	0.94			#		
Turbidity	NTU	0473	WL	09/21/2009	0001	10.3	-	19.7	0.9			#		
Turbidity	NTU	0475	WL	09/21/2009	0001	10.3	-	19.7	0.72			#		
Turbidity	NTU	0477	WL	09/21/2009	0001	10.3	-	19.7	0.79			#		
Turbidity	NTU	0479	WL	09/21/2009	0001	9.3	-	23.6	0.68			#		
Turbidity	NTU	0480	WL	09/16/2009	0001	18	-	18	0.83			#		
Turbidity	NTU	0483	WL	09/16/2009	0001	18	-	18	1.19			#		
Turbidity	NTU	0493	WL	09/21/2009	0001	54	-	54	2.17			#		
Turbidity	NTU	0557	WL	09/15/2009	0001	40	-	40	2.15			#		
Turbidity	NTU	0559	WL	09/16/2009	0001	19	-	19	2.24			#		
Turbidity	NTU	0560	WL	09/16/2009	0001	31	-	31	2.07			#		
Turbidity	NTU	0583	WL	09/21/2009	0001	18	-	18	1.94			#		
Turbidity	NTU	0588	WL	09/21/2009	0001	34	-	34	0.86			#		
Turbidity	NTU	0589	WL	09/21/2009	0001	52	-	52	3.36			#		
Turbidity	NTU	0671	WL	09/17/2009	0001	14.4	-	44.4	1.63			#		
Turbidity	NTU	0673	WL	09/17/2009	0001	16.3	-	46.3	9.91			#		
Turbidity	NTU	0675	WL	09/17/2009	0001	16	-	46	1.24			#		
Turbidity	NTU	0677	WL	09/17/2009	0001	15.2	-	45.2	1.24			#		
Turbidity	NTU	0679	WL	09/17/2009	0001	15	-	45	0.79			#		
Turbidity	NTU	0683	WL	09/21/2009	0001	27	-	27	1.56			#		
Turbidity	NTU	0689	WL	09/21/2009	0001	46	-	46	1.08			#		
Turbidity	NTU	0770	WL	09/22/2009	0001	14.9	-	34.8	4.81			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/3/2009

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Turbidity	NTU	0772	WL	09/22/2009	0001	15.15	-	35.05	2.27			#		
Turbidity	NTU	0775	WL	09/22/2009	0001	15.1	-	35	1.94			#		
Turbidity	NTU	0776	WL	09/22/2009	0001	15.15	-	35.05	1.51			#		
Turbidity	NTU	0778	WL	09/22/2009	0001	15.1	-	35	1.08			#		
Turbidity	NTU	0780	WL	09/15/2009	0001	28	-	28	3.95			#		
Turbidity	NTU	0782	WL	09/15/2009	0001	33	-	33	3.41			#		
Turbidity	NTU	0786	WL	09/15/2009	0001	28	-	28	1.25			#		
Turbidity	NTU	0787	WL	09/15/2009	0001	36	-	36	1.41			#		
Turbidity	NTU	SMI-PW02	WL	09/22/2009	0001	20.04	-	60.04	2.07			#		
Uranium	mg/L	0403	WL	09/16/2009	0001	18	-	18	1		J	#	8.7E-005	
Uranium	mg/L	0406	WL	09/21/2009	0001	18	-	18	0.96			#	8.7E-005	
Uranium	mg/L	0407	WL	09/16/2009	0001	17	-	17	0.49		J	#	3.5E-005	
Uranium	mg/L	0471	WL	09/21/2009	0001	10.3	-	19.7	1.3			#	8.7E-005	
Uranium	mg/L	0473	WL	09/21/2009	0001	10.3	-	19.7	0.8			#	8.7E-005	
Uranium	mg/L	0475	WL	09/21/2009	0001	10.3	-	19.7	0.83			#	8.7E-005	
Uranium	mg/L	0477	WL	09/21/2009	0001	10.3	-	19.7	0.83			#	8.7E-005	
Uranium	mg/L	0479	WL	09/21/2009	0001	9.3	-	23.6	1.2			#	8.7E-005	
Uranium	mg/L	0480	WL	09/16/2009	0001	18	-	18	0.61		J	#	3.5E-005	
Uranium	mg/L	0483	WL	09/16/2009	0001	18	-	18	1.2		J	#	8.7E-005	
Uranium	mg/L	0493	WL	09/21/2009	0001	54	-	54	2.9			#	8.7E-005	
Uranium	mg/L	0537	TS	09/24/2009	0001	0	-	0	3.6		J	#	8.7E-005	
Uranium	mg/L	0547	TS	09/22/2009	0001	0	-	0	2			#	8.7E-005	
Uranium	mg/L	0557	WL	09/15/2009	0001	40	-	40	3		J	#	8.7E-005	
Uranium	mg/L	0559	WL	09/16/2009	0001	19	-	19	0.68		J	#	8.7E-005	
Uranium	mg/L	0560	WL	09/16/2009	0001	31	-	31	2.3		J	#	8.7E-005	
Uranium	mg/L	0583	WL	09/21/2009	0001	18	-	18	0.59			#	8.7E-005	
Uranium	mg/L	0588	WL	09/21/2009	0001	34	-	34	2.5			#	8.7E-005	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/3/2009

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Uranium	mg/L	0589	WL	09/21/2009	0001	52	-	52	1.9			#	8.7E-005	
Uranium	mg/L	0589	WL	09/21/2009	0002	52	-	52	2			#	8.7E-005	
Uranium	mg/L	0671	WL	09/17/2009	0001	14.4	-	44.4	1.9		J	#	8.7E-005	
Uranium	mg/L	0673	WL	09/17/2009	0001	16.3	-	46.3	1.8		J	#	8.7E-005	
Uranium	mg/L	0675	WL	09/17/2009	0001	16	-	46	2		J	#	0.00017	
Uranium	mg/L	0677	WL	09/17/2009	0001	15.2	-	45.2	2.2		J	#	0.00017	
Uranium	mg/L	0679	WL	09/17/2009	0001	15	-	45	2.1		J	#	8.7E-005	
Uranium	mg/L	0683	WL	09/21/2009	0001	27	-	27	2			#	8.7E-005	
Uranium	mg/L	0688	WL	09/21/2009	0001	31	-	31	2.1			#	8.7E-005	
Uranium	mg/L	0689	WL	09/21/2009	0001	46	-	46	2.4			#	8.7E-005	
Uranium	mg/L	0770	WL	09/22/2009	0001	14.9	-	34.8	1.7			#	8.7E-005	
Uranium	mg/L	0772	WL	09/22/2009	0001	15.15	-	35.05	2			#	8.7E-005	
Uranium	mg/L	0772	WL	09/22/2009	0002	15.15	-	35.05	2.4			#	8.7E-005	
Uranium	mg/L	0775	WL	09/22/2009	0001	15.1	-	35	2.8			#	8.7E-005	
Uranium	mg/L	0776	WL	09/22/2009	0001	15.15	-	35.05	1.9			#	8.7E-005	
Uranium	mg/L	0778	WL	09/22/2009	0001	15.1	-	35	1.5			#	8.7E-005	
Uranium	mg/L	0778	WL	09/22/2009	0002	15.1	-	35	1.6			#	8.7E-005	
Uranium	mg/L	0780	WL	09/15/2009	0001	28	-	28	3.1		J	#	0.00017	
Uranium	mg/L	0782	WL	09/15/2009	0001	33	-	33	0.76		J	#	8.7E-005	
Uranium	mg/L	0786	WL	09/15/2009	0001	28	-	28	2.5		J	#	0.00017	
Uranium	mg/L	0787	WL	09/15/2009	0001	36	-	36	0.44		J	#	1.7E-005	
Uranium	mg/L	0800	SW	09/24/2009	0001	0	-	0	44		J	#	0.0017	
Uranium	mg/L	0801	SW	09/24/2009	0001	0	-	0	14		J	#	0.0017	
Uranium	mg/L	SMI-PW02	WL	09/22/2009	0001	20.04	-	60.04	2.6			#	8.7E-005	

Ft BLS = feet below land surface; C = centigrade; µmhos/cm = micromhos per centimeter; mV = millivolt; NTU = nephelometric turbidity unit; pCi/L = picocuries per liter; SL = surface location; S.U. = standard unit; TS = treatment system; WL = well

Appendix C. Water Quality Data (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 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.

Appendix D.
Water Level Data

Appendix D. Water Level Data

STATIC WATER LEVELS (USEE700) FOR SITE MOA01, Moab Site
REPORT DATE: 11/22/2009

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0403	O	3968.95	09/16/2009		16.28	3952.67	
0406	O	3969.91	09/21/2009		15.7	3954.21	
0407	O	3969.09	09/16/2009		17.01	3952.08	
0471		3964.37	09/21/2009		14.62	3949.75	
0473		3964.66	09/21/2009		14.62	3950.04	
0475		3964.97	09/21/2009		15.82	3949.15	
0477		3965.08	09/21/2009		15.44	3949.64	
0479		3964.67	09/21/2009		14.66	3950.01	
0480		3968.65	09/16/2009		16.17	3952.48	
0483		3968.9	09/16/2009		16.42	3952.48	
0493		3967.89	09/21/2009		14.04	3953.85	
0557		3968.85	09/15/2009		16.13	3952.72	
0559		3969.92	09/16/2009		17.45	3952.47	
0560		3968.77	09/16/2009		15.99	3952.78	
0583		3969.64	09/21/2009		16.53	3953.11	
0588		3968.82	09/21/2009		15.71	3953.11	
0589		3968.87	09/21/2009		15.51	3953.36	
0671		3969.5	09/17/2009		18.9	3950.6	
0673		3969.44	09/17/2009		19.39	3950.05	
0675		3969.64	09/17/2009		18.19	3951.45	
0677		3969.61	09/17/2009		17.28	3952.33	
0679		3969.59	09/17/2009		16.79	3952.8	
0683		3970.73	09/21/2009		17.07	3953.66	
0688		3968.66	09/21/2009		15.25	3953.41	
0689		3968.66	09/21/2009		15.36	3953.3	
0770		3968.86	09/22/2009		17.68	3951.18	
0772		3969.21	09/22/2009		18.25	3950.96	

Appendix D. Water Level Data (continued)

STATIC WATER LEVELS (USEE700) FOR SITE MOA01, Moab Site
REPORT DATE: 11/22/2009

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0775		3969.18	09/22/2009		17.65	3951.53	
0776		3968.97	09/22/2009		17.8	3951.17	
0778		3968.93	09/22/2009		18.41	3950.52	
0780		3968.45	09/15/2009		17.23	3951.22	
0782		3968.46	09/15/2009		17.05	3951.41	
0786		3968.14	09/15/2009		16.36	3951.78	
0787		3968.43	09/15/2009		16.74	3951.69	

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.
Interim Action Well Field Monthly Sampling Trip Report

Moab TAC Team

DATE: September 30, 2009

TO: K. Pill

FROM: James Ritchey, Tyler B. Meadows

SUBJECT: September 2009 IA Well Field Monthly Sampling Trip Report

Site: Moab, Utah

Date of Sampling Event: September 11-24, 2009

Team Members: James Ritchey, Tyler B. Meadows

RIN Number Assigned: All samples were assigned to RIN 0909036.

Sample Shipment: All samples were shipped in a cooler overnight UPS to ALS Laboratory Group from Moab, Utah, on September 11, 17, 23, and 24, 2009. The samples were assigned the following tracking numbers: 4498377373, 10192446442, 0196153804, 0196121419, and 0191883267.

September 2009 CF1 Sampling

Number of Locations Sampled: Six extraction wells (SMI-PW02, 0471, 0473, 0475, 0477, and 0479) and seven observation wells (0403, 0407, 0480, 0483, 0557, 0559, and 0560) were sampled. A total of 13 samples were collected during the September 2009 monthly sampling event.

Locations Not Sampled: None.

Field Variance: None

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

Well No.	Date	Time	Water Level (ft btoc)	Pump Intake (ft bgs)
SMI-PW02	09/22/2009	09:35	NA	55
0471	09/21/2009	13:32	14.62	18
0473	09/21/2009	13:38	14.62	18
0475	09/21/2009	13:44	15.82	18
0477	09/21/2009	13:49	15.44	18
0479	9/21/2009	13:54	14.66	23

ft bgs = feet below ground surface; ft btoc = feet below top of casing

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

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

Well No.	Date	Time	Depth to Water (ft btoc)	Sample Depth (ft bgs)
0403	09/16/2009	16:53	16.28	18
0407	09/16/2009	16:39	17.01	17
0480	09/16/2009	09:33	16.17	18
0483	09/16/2009	09:55	16.42	18
0557	09/15/2009	11:08	16.13	40
0559	09/16/2009	10:24	17.45	19
0560	09/16/2009	11:07	15.99	31

ft bgs = feet below ground surface; ft btoc = feet below top of casing

September 2009 CF2 Sampling

Number of Locations Sampled: Three observation wells (0583, 0588, and 0589) were sampled. Four samples, including one duplicate, were collected during the September 2009 monthly sampling event.

Locations Not Sampled: None.

Field Variance: None.

Quality-Control Sample Cross Reference: The false identifications assigned to the quality-control samples are shown below.

False ID	True ID	Sample Type	Associated Matrix	Ticket Number
2000	0589	Duplicate from 52 ft bgs	Ground Water	SEP 027

ft bgs = feet below ground surface; ID = identification

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

Well No.	Date	Time	Depth to Water (ft btoc)	Sample Depth (ft bgs)
0583	09/21/2009	09:13	16.53	18
0588	09/21/2009	09:48	15.71	34
0589	09/21/2009	09:29	15.51	52

ft bgs = feet below ground surface; ft btoc = feet below top of casing

September 2009 CF3 Sampling

Number of Locations Sampled: Five remediation wells (0671, 0673, 0675, 0677, and 0679) and three observation wells (0683, 0688-31, and 0689-46) were sampled. A total of eight samples were collected during the September 2009 monthly sampling event.

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

Locations Not Sampled: None.

Field Variance: None.

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

Well No.	Date	Time	Water Level (ft btoc)	Pump Intake (ft bgs)
0671	09/17/2009	10:17	18.90	35
0673	09/17/2009	10:22	19.39	35
0675	09/17/2009	10:28	18.19	35
0677	09/17/2009	11:07	17.28	35
0679	09/17/2009	11:16	16.79	35

ft bgs = feet below ground surface; ft btoc = feet below top of casing

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

Well No.	Date	Time	Depth to Water (ft btoc)	Sample Depth (ft bgs)
0683	09/21/2009	11:20	17.07	27
0688-31	09/21/2009	10:35	15.25	31
0689-46	09/21/2009	10:54	15.36	46

ft bgs = feet below ground surface; ft btoc = feet below top of casing

September 2009 CF4 Sampling

Number of Locations Sampled: Five extraction wells (0770, 0772, 0775, 0776, and 0778) and four observation wells (0780, 0782, 0786, and 0787) were sampled. Two surface samples were collected for each of four surface water locations (0274, 0277, 0278, and 0279) for ammonia analysis. A total of 19 samples, including two duplicates, were collected during the September 2009 monthly sampling event.

Locations Not Sampled: None.

Field Variance: None

Quality-Control Sample Cross Reference: The false identifications assigned to the quality-control samples are shown below.

False ID	True ID	Sample Type	Associated Matrix	Ticket Number
2001	0772	Duplicate from 35 ft bgs	Ground Water	SEP 041
2002	0778	Duplicate from 35 ft bgs	Ground Water	SEP 045

ft bgs = feet below ground surface; ID = identification

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

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

Well No.	Date	Time	Water Level (ft btoc)	Pump Intake (ft bgs)
0770	09/22/2009	08:44	17.68	35
0772	09/22/2009	08:53	18.25	35
0775	09/22/2009	09:03	17.65	35
0776	09/22/2009	09:11	17.80	35
0778	09/22/2009	09:19	18.41	35

ft bgs = feet below ground surface; ft btoc = feet below top of casing

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

Well No.	Date	Time	Depth to Water (ft btoc)	Sample Depth (ft bgs)
0780	09/15/2009	09:45	17.23	28
0782	09/15/2009	10:01	17.05	33
0786	09/15/2009	10:28	16.86	28
0787	09/15/2009	10:45	16.74	36

ft bgs = feet below ground surface; ft btoc = feet below top of casing

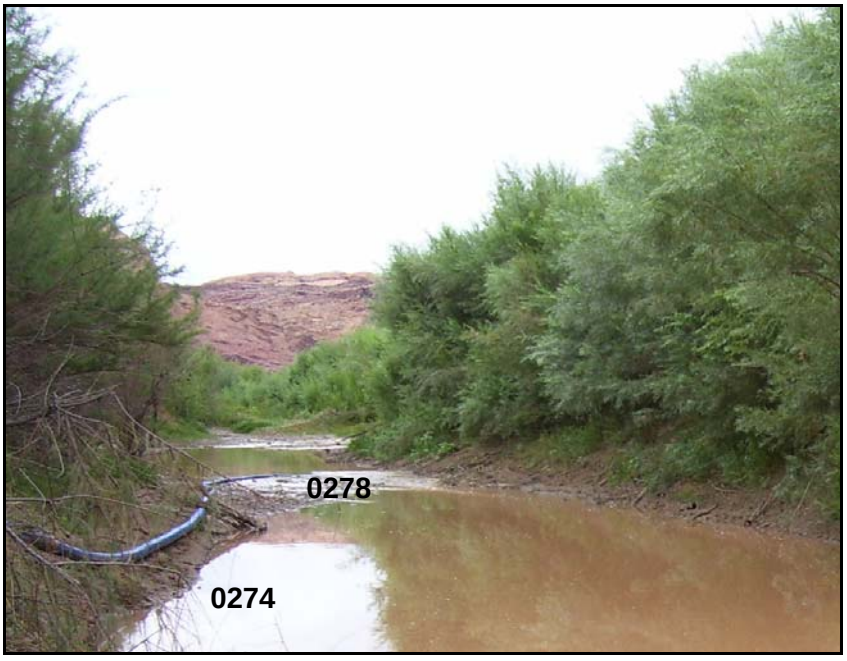
Location-Specific Information – Surface Water Sampling: The table below shows the surface water locations sampled.

SW No.	Date	Time	Depth (inches below surface)	Characteristics
0274	09/11/2009	10:06	2	Stagnate, ebbing upstream
0274	09/15/2009	15:07	3	Turbid from raised river flow/stagnate
0277	09/11/2009	10:12	3	Low flow
0277	09/15/2009	15:17	4	Turbid from raised river flow; low flow
0278	09/11/2009	10:16	2	Low flow
0278	09/15/2009	15:11	3	Turbid from raised river flow; steady flow
0279	09/11/2009	10:20	3	Low flow
0279	09/15/2009	15:02	4	Turbid from raised river flow; steady flow

SW = surface well

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

Sample Location 0279 (facing south)



Sample Locations 0274 and 0278 (facing north)

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

Sample Location 0277 (facing southeast)

September 2009 Baseline Sampling

Number of Locations Sampled: Two observation wells (0406 and 0493) were sampled during the September 2009 monthly sampling event.

Locations Not Sampled: None.

Field Variance: None.

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

Well No.	Date	Time	Depth to Water (ft btoc)	Sample Depth (ft bgs)
0406	09/21/2009	15:44	15.70	18
0493	09/21/2009	15:03	14.04	54

ft bgs = feet below ground surface; ft btoc = feet below top of casing

September 2009 Wick Pond Sampling Event

Number of Locations Sampled: Grab samples were collected from the wick system discharge outlet (0537), the surface of the wick pond (0800), and from the pothole (0801) excavated on the north side of the wick pond. Samples were collected unfiltered, and no parameters were recorded due to the unknown nature of the liquids. Samples were shipped to the laboratory for the following analyses: calcium, iron, manganese, uranium, ammonia, phosphate, sulfate, nitrate,

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

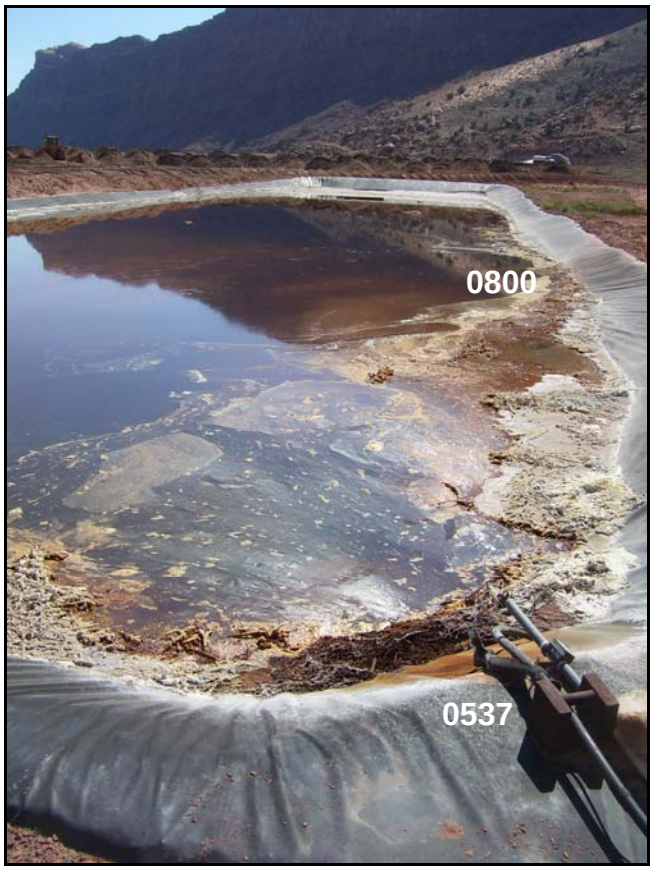
TDS, total organic compounds, and gross alpha and beta. A total of three samples were collected during the September 2009 monthly sampling event.

Locations Not Sampled: None.

Field Variance: None

SW No.	Date	Time	Depth (inches below surface)	Characteristics
0537	09/24/2009	10:10	Direct from outlet	Slight yellowish tint
0800	09/24/2009	10:25	Surface	Dark amber color; strong odor
0801	09/24/2009	10:45	Surface	Turbid; strong odor

SW = surface well



Sample Locations 0537 and 0880

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

Sample Location 0801

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

Date	Daily Mean Flow (cfs)
09/11/2009	3,490
09/15/2009	3,890
09/16/2009	3,950
09/17/2009	4,130
09/21/2009	4,270
09/22/2009	4,410
09/24/2009	4,540

Equipment Issues: None.

Corrective Action Required/Taken: None.