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Office of Environmental Management – Grand Junction

UMTRA Project

Moab UMTRA Project
Groundwater and Surface Water Monitoring Report
January through June 2020

Revision 0

November 2020

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Revision 0

Review and Approval

11/30/2020

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Revision History

Revision	Date	Reason for Revision
0	November 2020	Initial issue.

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Figures

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Tables

Appendices

Acronyms and Abbreviations

bgs	below ground surface
CCB	continuing calibration blank
CCV	continuing calibration verification
CF	Configuration
cfs	cubic feet per second
CFR	Code of Federal Regulations
cm	centimeter
COC	chain-of-custody
CRI	reporting limit verification
DOE	U.S. Department of Energy
EB	equipment blank
EDD	electronic data deliverable
EPA	U.S. Environmental Protection Agency
ft	feet or foot
ICP	inductively coupled plasma
ICV	initial calibration verification
IDL	instrument detection limit
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
µmhos	micro ohms
MB	method blank
MDL	method detection limit
mg/L	milligrams per liter
MS	matrix spike
MSD	matrix spike duplicate
QC	quality control
r^2	correlation coefficient
RIN	report identification number
RL	reporting limit
RPD	relative percent difference
SD	serial dilution
SDG	sample data group
UMTRA	Uranium Mill Tailings Remedial Action

1.0 Introduction

1.1 Purpose

The purpose of this semi-annual report is to summarize the results associated with groundwater and surface water samples collected from the U.S. Department of Energy (DOE) Moab Uranium Mill Tailings Remedial Action (UMTRA) Project site during the first half of 2020. The results of the data validation process are also presented.

Three sampling events were completed during this time frame. The first event was associated with Crescent Junction wells 0202 and 0205 (Figure 1) sampling in February 2020 as part of the quarterly monitoring for the first quarter of 2020. The second event included the collection of samples from the Configuration (CF) 4 monitoring wells and CF5 groundwater extraction wells in April 2020. These locations are shown on Figure 2.

The third event started in May and was completed in June 2020, in which samples were collected from a variety of site-wide groundwater and surface water locations. Groundwater and surface water sampling locations are shown on Figures 3 and 4, respectively. Site-wide groundwater sampling was conducted to assess any changes and trends in water quality. The surface water samples associated with this event were collected to assess surface water quality adjacent to the site compared to upstream and downstream water quality.

1.2 Scope

This report presents the Summary of Sampling Events and Data Assessments, including a summary of the anomalous data generated by the validation process and results for these events. Sampling and analyses were conducted in accordance with the *Moab UMTRA Project Surface Water/Groundwater Sampling and Analysis Plan* (DOE-EM/GJTAC1830). All data validation follows criteria in the *Moab UMTRA Project Standard Practice for Validation of Laboratory Data* (DOE-EM/GJTAC1855).

Appendix A includes the Water Sampling Field Activities Verification, Minimums and Maximums Report, Water Quality Data, Water Level Data, and the trip report associated with the February 2020 Crescent Junction sampling event. Appendix B provides similar documentation for the April CF4 and CF5 event with the exception of the Minimums and Maximums Report. The documentation associated with the May/June 2020 site-wide sampling event, including the Blanks Report, is provided in Appendix C.

All Colorado River flows discussed in this document were measured from the U.S. Geological Survey Cisco gaging station number 09180500. River elevation data were collected adjacent to the site, and river flows are reported as cubic feet per second (cfs).

The Minimums and Maximums Reports were generated (by the MESa database) to determine if the applicable data were within a normal statistical range. The new data set was compared to the historical data to determine if the new data fall outside the historical range. 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.

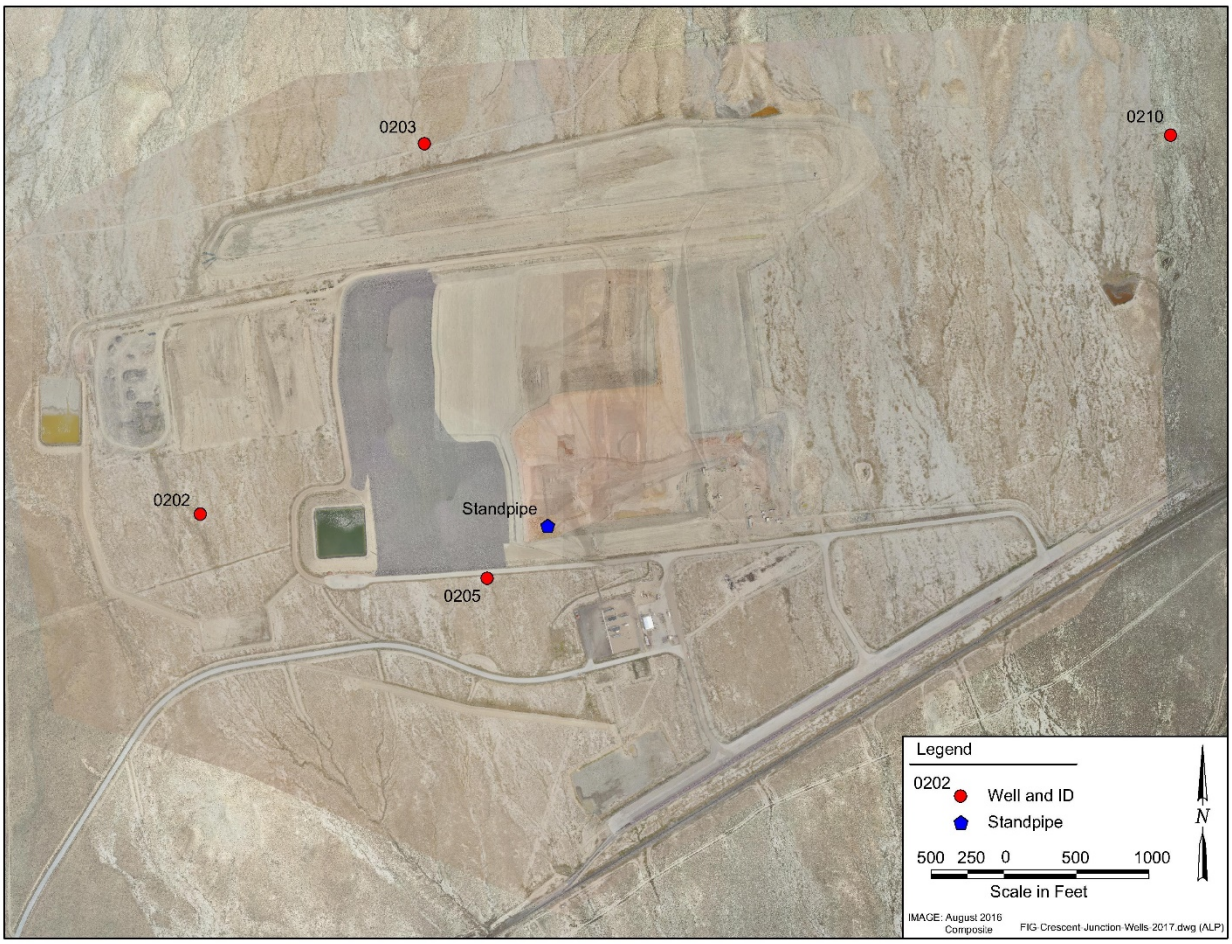

Figure 1. Crescent Junction Wells 0202 and 0205 Sampling Locations

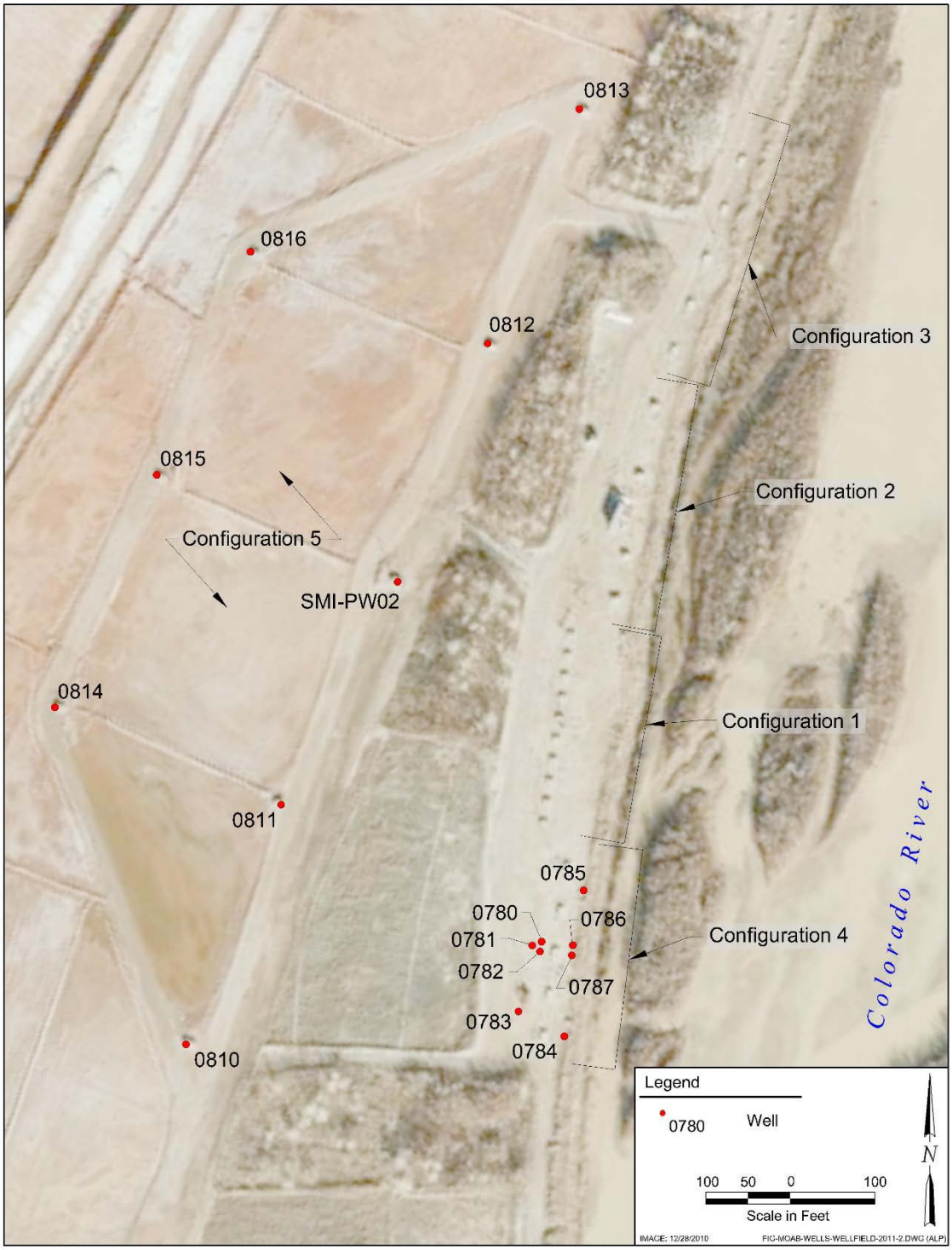

Figure 2. First Half 2020 CF4 and CF5 Groundwater Sampling Locations

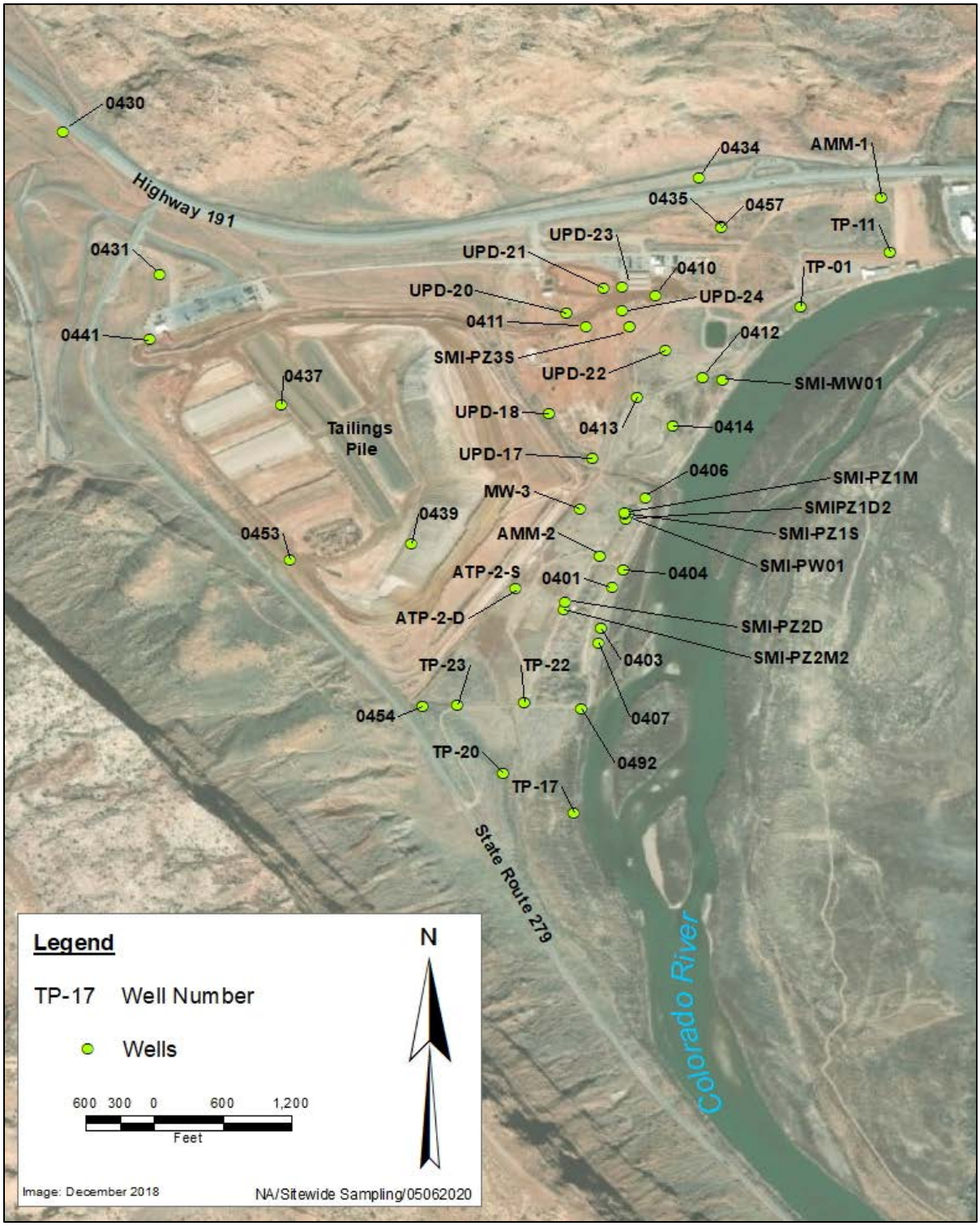

Figure 3. May/June 2020 Site-wide Groundwater Sampling Locations

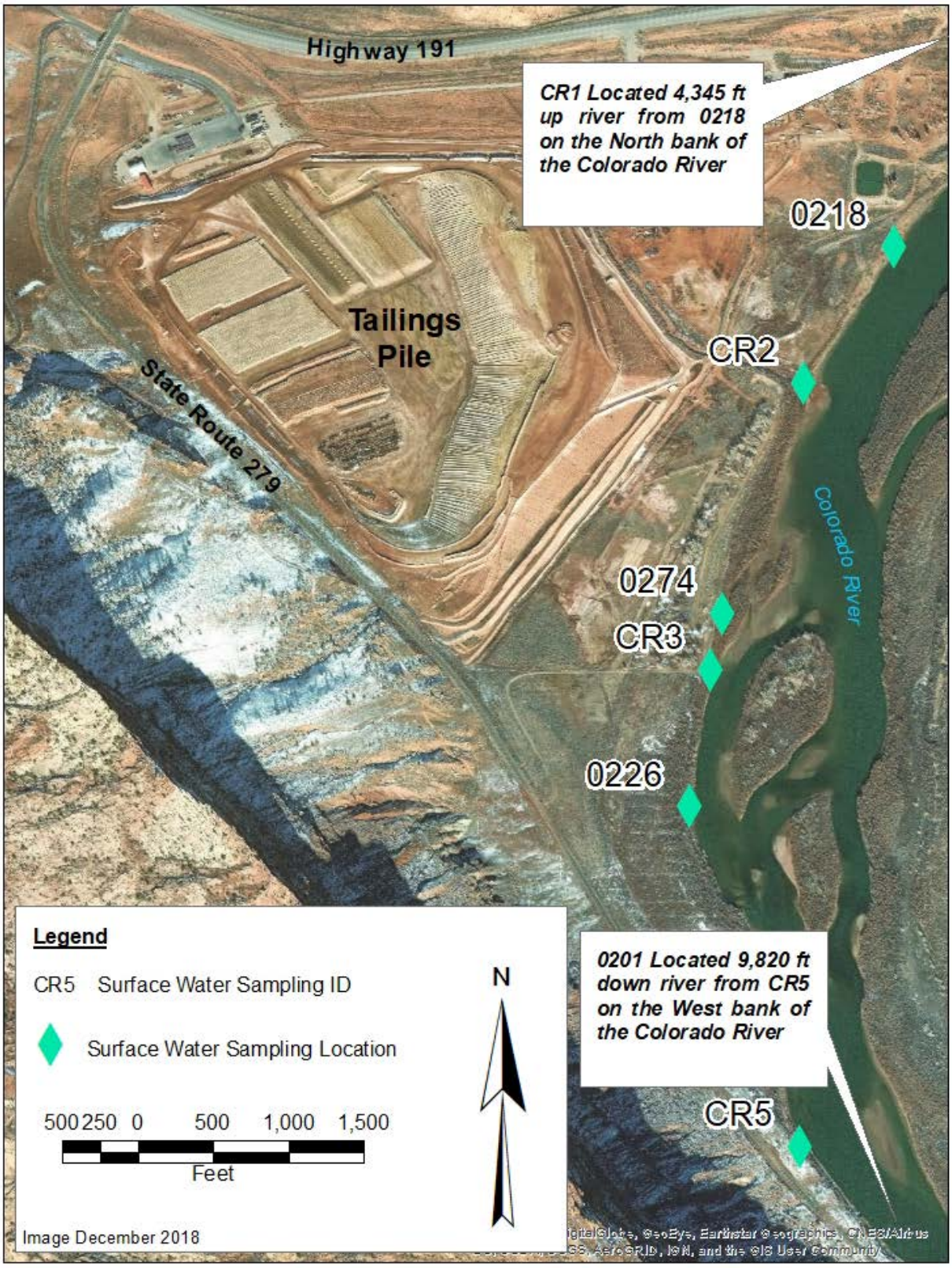

Figure 4. May/June 2020 Surface Water Sampling Locations

2.0 Summary of Sampling Events

2.1 February 2020 Crescent Junction Sampling Event

Groundwater samples were collected from wells 0202 and 0205 as part of the quarterly monitoring at the Crescent Junction site. If water is present in any of the four monitoring wells during a quarterly monitoring event, a sample may be collected.

2.2 April 2020 CF4 and CF5 Sampling Event

Groundwater samples were collected from the eight CF4 monitoring wells to determine the impact of the freshwater injection system on the shallow aquifer. The freshwater injection system was operational in 2020 starting in early January (after being shut down for two weeks during the holidays), and operations were suspended in late March for the freshwater pond cleanout activities. The system was restarted at the end of March, and the samples were collected one week later. By the time these CF4 monitoring wells were sampled, 4.1 mil gal of freshwater were injected since the beginning of 2020. These ground water samples were collected to determine how effectively the freshwater injection system was diluting the ammonia concentrations, particularly downgradient of the CF4 injection wells.

Ground water samples were also collected from the eight CF5 groundwater extraction wells during the early stages of the 2020 operation of the groundwater extraction system. The system was restarted in mid-March after being winterized for four months following the procedure in the Operation and Maintenance Manual. The results from this event were used to update the contaminant mass removal calculations.

2.3 May/June 2020 Site-wide Sampling Event

Fifty-six groundwater and surface water samples were collected as part of the site-wide event. This event corresponds to the time frame when the Colorado River is generally experiencing peak spring runoff flow conditions. The 48 groundwater samples were collected from a variety of downgradient and cross-gradient locations at various depths. Locations in the vicinity of the northeastern uranium plume were also included. The eight surface water samples were collected upstream, downstream, and adjacent to the site during this event. All samples were submitted to ALS Global Laboratory for ammonia and uranium analysis. Based on historical results, some select monitoring well locations were also analyzed for arsenic and selenium.

3.0 Data Assessment

The following definitions are associated with the data validation process and apply to Section 3.0. Data validation details are provided in the following sections of this report for the individual sampling events.

Laboratory Instrument Calibration
Compliance requirements for satisfactory instrument calibration are established to ensure the instrument is capable of producing acceptable qualitative and quantitative data for all analytes. Initial calibration demonstrates the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear curve.

Compliance requirements for continuing calibration checks are established to ensure the instrument continues to produce acceptable qualitative and quantitative data.

In addition, for inductively coupled plasma (ICP) analytes (uranium), reporting limit verifications (CRIs) verify the linearity of the calibration curve near the reporting limit (RL). For ICP-mass spectrometry analytes (uranium), instrument tuning and performance criteria are checked for mass calibration and resolution verifications. For ICP-mass spectrometry analyte uranium, internal standards are also analyzed to indicate stability of the instruments.

Method and Calibration Blanks
Method blanks (MBs) are analyzed to assess any contamination that may have occurred during sample preparation. Both initial calibration blanks and continuing calibration blanks (CCBs) are analyzed to assess instrument contamination before and during sample analysis. Depending on method requirements, detected sample results greater than the method detection limit (MDL) or instrument detection limit (IDL) were qualified "J" when the detections were less than five times the blank concentration. Non-detects were not qualified.

Equipment Blanks
An equipment blank (EB) is a sample of analyte-free media collected from a rinse of non-dedicated sampling equipment used to sample surface water. EBs are collected to document adequate decontamination of non-dedicated equipment.

Laboratory Control Sample Duplicates
Matrix spike (MS) samples may not be generated due to a limited sample volume. Instead, laboratory control sample (LCS) duplicates **(**LCSDs) are performed. LCSDs that contain known concentrations of the analyte of interest are prepared in the laboratory. The results are used to demonstrate the laboratory is in control of the preparation and analysis of samples.

Matrix Spike and Replicate Analysis
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. The MS sample results are required to be within the recovery limits.

Laboratory Replicate Analysis
The laboratory replicate results demonstrate acceptable laboratory precision. The relative percent difference (RPD) values for the reported matrix spike duplicate (MSD) results for all other analytes should be less than 20 percent for results greater than five times the RL.

Field Duplicate Analysis
Field duplicate samples are collected and analyzed as an indication of the 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. The duplicate results must meet the U.S. Environmental Protection Agency (EPA)-recommended laboratory duplicate criteria of less than 20 RPD for results that are greater than five times the RL.

Laboratory Control Samples
LCSs provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. Per national environmental laboratory accreditation requirements provided by the National Environmental Laboratory Accreditation Institute, an MS may be used in place of an LCS provided the acceptance criteria are as stringent.

Metals Serial Dilution
Serial dilution (SD) samples are prepared and analyzed for the metals analyses to monitor chemical or physical interferences in the sample matrix.

Detection Limits/Dilutions
Dilutions are prepared in a consistent and acceptable manner when they are required. CRIs are re-run at the beginning of each analytical run as a measure of accuracy near the RL. CRIs were made at the required frequency to verify the linearity of the calibration curve near the RL.

3.1 February 2020 Crescent Junction Sampling Event

3.1.1 Laboratory Performance Assessment

This validation was performed according to *Standard Practice for Validation of Laboratory Data*. The procedure was applied at Level 2, Data Deliverables Examination. All analyses were successfully completed.

General Information and Validation Results

RIN	2002119
Laboratory:	ALS Analytics, Fort Collins, Colorado
SDG Numbers:	2002480
Analysis:	Metals, Inorganics, Isotopic Uranium
Validator:	Nina Andrews
Review Date:	17 November 2020

The samples were prepared and analyzed using accepted procedures as shown in Table 1.

Table 1. February 2020 Crescent Junction Sampling Event, Analytes and Methods

Analyte	Preparation Method	Analytical Method
Ammonia as N, NH_3-N	EPA 350.1	EPA 350.1
Alkalinity	EPA 310.1	EPA 310.1
Bicarbonate	EPA 310.1	EPA 310.1
Carbonate	EPA 310.1	EPA 310.1
Nitrate/Nitrite as N	EPA 353.2	EPA 353.2
Bromide	EPA 300.0 Rev 2.1	300.0 Rev 2.1
Chloride	EPA 300.0 Rev 2.1	300.0 Rev 2.1
Fluoride	EPA 300.0 Rev 2.1	300.0 Rev 2.1
Sulfate	EPA 300.0 Rev 2.1	300.0 Rev 2.1
Arsenic, Barium, Boron, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Potassium, Selenium, Silver, Sodium	SW-6010B	EPA 6010B
Uranium	SW-846- 3005A	SW-846 6020A
Total Dissolved Solids	EPA 160.1	540 C
Isotopic Uranium	SOP 776/778	SOP 714

Data Qualifier Summary

Analytical results were qualified as listed in Table 2. Refer to Table 3 for an explanation of the data qualifiers applied.

Table 2. February 2020 Crescent Junction Sampling Event, Data Qualifiers

Sample Number	Location	Analyte	Flag	Reason
SDG 2002480	0202, 0205	Inorganics	J	MS-1, MSD-1
SDG 2002480	0202, 0205	All Metals	J	MS-1, MSD-1, SD-1
SDG 2002480	0202, 0205	Isotopic Uranium	J	MS-1, MSD-1, SD-1

Notes: "J" indicates results are estimated; it becomes "UJ" for analytical results lower than the detection limit.

Table 3. February 2020 Crescent Junction Sampling Event, Reason Codes for Data Flags

Reason Code	Qualifier (Detects)	Qualifier (Non-detects)	Explanation
MS-1	J	UJ	The MS sample chosen was from another client and not included in the narrative.
MSD-1	J	UJ	No MSD data was included in the narrative.
SD-1	J	N/A	Serial dilution analysis was not conducted on any samples.

Notes: "J" indicates results are estimated; it becomes "UJ" for analytical results lower than the detection limit.

Sample Shipping/Receiving

ALS Analytics in Fort Collins, Colorado, received two samples for Report Identification Number (RIN) 2002119 in a shipment of one cooler. The shipment Sample Data Group (SDG) 2002480 contained one ground water sample from Crescent Junction well 0202 and another from well 0205. The temperature of the cooler was 3.6°C and it arrived on February 28, 2020 (Tracking number 1Z5W1Y510192391064).

The Chain of Custody (COC) forms were checked to confirm that all of the samples were listed on the form with sample collection dates and times, and signatures and dates were present indicating sample relinquishment and receipt. The sample submittal documents, including the COC forms and the sample tickets, had no errors or omissions.

Preservation and Holding Times

The samples were received in the correct container types and had been preserved correctly for the requested analyses. The samples were analyzed within the applicable holding time.

Case Narratives

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

This analytical method quantifies U-235-236 as the sum of all alpha activity with emission energy less than that of U-234 and greater than that of U-238. A limitation of this method is that measurable amounts of U-234 in the sample may cause a small amount of characteristic activity in the U-235-236 region of interest that is due to poorly resolved alpha activity at the boundary between the two regions. Peak resolution at this level is inherently limited by methodology and software capabilities. Consequently, there is a potential high bias in the reported U-235/236 results, which are submitted without further

qualification.

Due to limited sample volume, reduced aliquots were taken for analysis for these samples, As a result, the requested MDC for all analytes was not met for the samples. The reported activity for these samples is greater than the achieved MDC. These samples are identified with an "M3" flag on the final reports.

Matrix Spike and Replicate Analysis
For all analyses, the selected quality control samples were from another client and not included in the narrative. As a result, there was not a MSD or a SD sample analysis. Therefore, all of the data are flagged "J" for reasons MS-1, MSD-1, and metals and isotopic uranium data were also flagged for reason SD-1.

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

Electronic Data Deliverable Files
The Electronic Data Deliverable (EDD) files arrived on March 25, 2020. The contents of the EDD were manually examined to ensure all and only the requested data were delivered in compliance with requirements and that the sample results accurately reflected the data contained in the sample data package.

3.1.2 Minimums and Maximums Report and Anomalous Data Review
Appendix A contains the Minimums and Maximums Report for this sampling event. Based on the results, all concentrations were within the acceptable ranges, and there were no anomalous data values associated with this sampling event.

3.2 April 2020 CF4 and CF5 Sampling Event

3.2.1 Laboratory Performance Assessment
This validation was performed according to *Standard Practice for Validation of Laboratory Data*. The procedure was applied at Level 3, Data Deliverables Examination. All analyses were successfully completed.

General Information and Validation Results

RIN	2004120
Laboratory:	ALS Analytics, Fort Collins, Colorado
SDG Numbers:	2004124
Analysis:	Metals and Inorganics
Validator:	Nina Andrews
Review Date:	17 November 2020

The samples were prepared and analyzed using accepted procedures as shown in Table 4.

Table 4. April 2020 CF4/CF5 Sampling Event, Analytes and Methods

Analyte	Preparation Method	Analytical Method
Ammonia as N, NH_3-N	EPA 350.1	EPA 350.1
Uranium	SW-846- 3005A	SW-846 6020A

Data Qualifier Summary

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

Table 5. April 2020 CF4/CF5 Sampling Event, Data Qualifiers

Sample Number	Location	Analyte	Flag	Reason
SDG 2004124-1 through -17	All in SDG 2004124	Ammonia	J	MSD-1
SDG 2004124-1 through -17	All in SDG 2004124	Uranium	J	MS-1, MSD-2
SDG 2004124-1 through -17	All in SDG 2004124	Uranium	J	SD-1

Notes: "J" indicates results are estimated; it becomes "UJ" for analytical results lower than the detection limit.

Table 6. April 2020 CF4/CF5 Sampling Event, Reason Codes for Data Flags

Reason Code	Qualifier (Detects)	Qualifier (Non-detects)	Explanation
MS-1	J	UJ	The MS sample chosen was from another client.
MSD-1	J	UJ	No MSD data was included in the narrative.
MSD-2	J	UJ	The MSD sample chosen from another client.
SD-1	J	N/A	No SD was run with the sample group.

Notes: "J" indicates results are estimated; it becomes "UJ" for analytical results lower than the detection limit.

Sample Shipping/Receiving

ALS Analytics received a total of 17 samples for RIN 2004120 in one shipment, which arrived on May 10, 2020 (UPS tracking number 1Z5W1Y510194037550). The SDG was accompanied by a chain-of-custody (COC) form.

The COC forms were checked to confirm that all of the samples were listed on the form with sample collection dates and times, and 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 of the SDGs were received intact with a temperature of 3.6°C, which complies with requirements. All samples were received in the correct container types. All samples were analyzed within the applicable holding times.

Case Narratives

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

Laboratory Instrument Calibration

Method SW-846 6020A, Uranium

The initial calibrations were performed using five calibration standards and one blank, resulting in calibration curves with correlation coefficient (r^2) values greater than 0.995. The values of the

calibration curve intercepts for uranium were positive and less than 3 times the IDL.

Initial calibration verification (ICV) and continuing calibration verification (CCV) checks were made at the required frequency. All calibration checks met the acceptance criteria. CRIs were made at the required frequency to verify the linearity of the calibration curve near the RL. The CRI verifications were within the acceptance criteria range.

Mass calibration and resolution verifications were performed at the beginning of each analytical run in accordance with the analytical procedure. Internal standard recoveries were stable and within acceptable ranges.

Method EPA 350.1, Ammonia as N

Initial calibrations for ammonia as N was performed using five calibration standards and one blank. The calibration curve had a r^2 value greater than 0.995; however, the slope intercept was more than 3x the MDL. The samples that have a concentration less than 3x the y-intercept are flagged "J".

ICV and CCV checks were made at the required frequency. All calibration checks met the acceptance criteria.

Method and Calibration Blanks

CCBs were made at the required frequency for ammonia in SDG 2004124 and none were above the MDL so no sample results, detect or non-detect, were qualified or flagged.

All CCBs for uranium were made at the required frequency for SDG 2004124 and none were above the MDL so no sample results were qualified or flagged.

Matrix Spike Analysis

Sample locations 2004124-2 (0780), 2004124-12 (0785), and 2004124-30 (0816) were chosen for the ammonia matrix spike analysis. The correct amount of matrix spikes were analyzed for the amount of samples in this SDG even considering one of the three failed due to low percent recovery. However, a MSD sample was not analyzed. All ammonia data had to be flagged "J" for reason MSD-1.

For the uranium analysis for this SDG, the MS sample that was selected for Quality Control (QC) analysis was from another client and the information was not included in the analysis. Therefore, all of the uranium data was flagged "J" for reasons MS-1 and MSD-2.

Laboratory Replicate Analysis

The uranium SDGs did not contain an MS or MSD sample. Therefore all of the uranium data is flagged "J" for reason MS-1 and MSD-2

A matrix spike was performed for the ammonia SDG and was within the recovery range. However, a matrix spike duplicate was not performed and so the data were flagged "J" for reason MSD-2.

Field Duplicate Analysis

A duplicate sample was collected from location 2004124-31 (SMI-PW02). The duplicate results met the U.S. EPA recommended laboratory duplicate criteria of less than 20 percent RPD for results that are greater than 5x the RL.

Laboratory Control Samples
LCS results were acceptable for ammonia analyses. LCSs were not reported for uranium. Per national environmental laboratory accreditation requirements provided by the NELAC Institute, an MS may be used in place of an LCS provided the acceptance criteria are as stringent.

Metals Serial Dilution
Since no serial dilution samples were run on the uranium samples in any of the SDGs, the uranium samples were flagged "J" for reason SD-1.

Detection Limits/Dilutions
Dilutions were prepared in a consistent and acceptable manner when they were required. The required detection limits were achieved for all analytes.

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

Electronic Data Deliverable Files
EDD files arrived April 25, 2020. The contents of the EDD were manually examined to ensure all and only the requested data were delivered in compliance with requirements and that the sample results accurately reflected the data contained in the sample data package.

3.2.2 Minimums and Maximums Report and Anomalous Data Review
Based on the results, all concentrations were within the historical ranges, and there were no anomalous data values associated with this sampling event.

3.3 May/June 2020 Site-wide Sampling Event

3.3.1 Laboratory Performance Assessment
This validation was performed according to *Standard Practice for Validation of Laboratory Data.* The procedure was applied at Level 3, Data Deliverables Examination. All analyses were successfully completed.

General Information and Validation Results

RIN	2005121
Laboratory:	ALS Analytics, Fort Collins, Colorado
SDG Numbers:	2006096, 2006373, 2007024
Analysis:	Metals and Inorganics
Validator:	Nina Andrews
Review Date:	28 October 2020

The samples were prepared and analyzed using accepted procedures as shown in Table 7. Analytical results were qualified as listed in Table 8. Refer to Table 9 for an explanation of the data qualifiers applied.

The initial data report for SDG 2006373 did not include arsenic and selenium results. A revised report was provided on November 10, 2020 that included all these results.

Table 7. May/June 2020 Site-wide Sampling Event, Analytes and Methods

Analyte	Preparation Method	Analytical Method
Ammonia as N	EPA 350.1	EPA 350.1
Uranium	SW-846 3005A	SW-846 6020A
Arsenic	SW-846 3005A	ICP-MS 6020B
Selenium	SW-846 3005A	ICP-MS 6020B

Table 8. May/June 2020 Site-wide Sampling Event, Data Qualifiers

Sample Number	Location	Analyte	Flag	Reason
2006096-1 through 21 2006373 -1 through 28 2007024 -1 through 10	All in each metals SDG	Uranium	J	MS-1, MSD-1, SD-1
2006096-1 through 21 2006373 -1 through 28	All in SDGs 2006096 and SDG 2006373	Arsenic and Selenium	J	MS-1, MSD-1, SD-1
2006096-1 through 21	All in SDG 2006096	Ammonia	J	MS-2, MSD-1
2006373 -1 through 28	All in SDG 2006373	Ammonia	J	MS-2, MSD-1
2007024 -1 through 10	All in SDG 2007024	Ammonia	J	MS-2, MSD-1

Notes: "J" indicates results are estimated and becomes "UJ" for analytical results lower than the detection limit.

Table 9. May/June 2020 Site-wide Sampling Event, Reason Codes for Data Flags

Reason Code	Qualifier (Detects)	Qualifier (Non-detects)	Explanation
SD-1	J	U	No serial dilutions were run during the uranium analysis.
MS-1	J	U	No MS data was included in narrative.
MSD-1	J	U	No MSD data was included in the narrative.
MS-2	J	U	The MS failed due to a low percent recovery.

Notes: "J" indicates results are estimated and becomes "UJ" for analytical results lower than the detection limit.

Sample Shipping/Receiving

ALS Analytics in Fort Collins, Colorado, received a total of 59 samples for RIN 2005121 in three shipments (Table 14).

Table 10. May/June 2020 Site-wide Sampling Event, Sample Shipping/Receiving

SDG	Number of Samples	Date Shipped	UPS Tracking Number
2006096	21	6/04/20	1Z5W1Y510191957633
2006373	28	6/18/20	1Z5W1Y510197408199
2007024	10	6/30/20	1Z5W1Y510196941408

The three SDGs 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
All of the SDGs were received intact. SDG 2006096 was received with a temperature of 1.4°C, SDG 2006373 was received with a temperature of 1.9°C, and SDG 2007024 was received with a temperature of 2.0°C. All three SDGs were received with compliant temperatures, and were received in the correct container types. All samples were analyzed within the applicable holding times.

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

Laboratory Instrument Calibration

Method SW-846 6020A, Uranium
ICV and CCV checks were made at the required frequency. All calibration checks met the acceptance criteria.

CRIs were made at the required frequency to verify the linearity of the calibration curve near the RL. The CRI verifications were within the acceptance criteria range for all SDGs.
Mass calibration and resolution verifications were performed at the beginning of each analytical run in accordance with the analytical procedure.

Internal standard recoveries were stable and within acceptable ranges.

Method ICP-MS 6020B, Arsenic and Selenium

ICV and CCV checks were made at the required frequency. All calibration checks met the acceptance criteria.

CRIs were made at the required frequency to verify the linearity of the calibration curve near the RL. The CRI verifications were within the acceptance criteria range for all SDGs.
Mass calibration and resolution verifications were performed at the beginning of each analytical run in accordance with the analytical procedure.

Internal standard recoveries were stable and within acceptable ranges.

EPA 350.1, Ammonia as N
Initial calibrations for ammonia as N on all SDGs were performed using five calibration standards and one blank. The calibration curve had a r^2 value greater than 0.995.

ICV and CCV checks were made at the required frequency. All calibration check results for all SDGs were within the acceptance criteria.

Method and Calibration Blanks

All but eight CCBs for ammonia reported lower than the IDL. Of the eight that reported higher than the IDL when data was checked to five times their result none was flagged because all were at non-detect level. No samples were flagged for ammonia.

One CCB for uranium in SDG 2006096 and three in SDG 2006373 were higher than the IDL. None of the associated sample results were less than five times the blank concentrations thus none were flagged. All CCBs for uranium on SDG 2007024 reported lower than the IDL so no samples were flagged for uranium.

All CCBs for arsenic on SDG 2006096 and SDG 2006373 reported lower than the IDL so no samples were flagged for arsenic. Samples in SDG 2007024 were not analyzed for arsenic. All CCBs for selenium on SDG 2006096 and SDG 2006373 reported lower than the IDL so no samples were flagged for selenium. Samples in SDG 2007024 were not analyzed for selenium.

Equipment Blanks
One equipment blank (location 2002, 2006373-14) was collected after the surface water tubing was decontaminated. The result was 0.2 milligrams per liter (mg/L) of ammonia (which is the reporting limit) and each surface water sample also had 0.2 mg/L of ammonia, so none were flagged. The result had 0.0012 mg/L of uranium (which is less than the reporting limit) and all the surface water sample results were under the reporting limit so none were flagged.

Matrix Spike Analysis
For all of the uranium, arsenic, and selenium SDGs, the MS sample that was selected for QC analysis was from another client and the information was not included in the analysis. Therefore, all of the metals data on was flagged "J" for reason MS-1.

All three ammonia SDGs (2006096, 2006373, and 2007024) had a low recovery on the matrix spike analysis. Therefore, all of the ammonia data in SDGs 2006096, 2006373, and 2007024 have been flagged "J" for reason MS-2.

Laboratory Replicate Analysis
The metals SDGs did not contain an MS or MSD sample. Therefore all of the uranium, arsenic, and selenium data is flagged "J" for reason MSD-1.

For ammonia there were no matrix spike duplicates run for any of the SDGs so all samples were flagged for MSD-1; lack of matrix spike duplicates. All samples in SDGs 2006096, 2006373, and 2007024 were flagged for a matrix spike failing due to low recovery.

Field Duplicate Analysis
Duplicate samples were collected from locations AMM-2 (2006096-13), 0218 (2006373-3), and 0407 (2007024-11), The duplicate results met the EPA recommended laboratory duplicate criteria of less than 20 percent RPD for results that are greater than 5x the RL.

Laboratory Control Samples
LCS results were acceptable for ammonia analyses. Per national environmental laboratory accreditation requirements provided by the NELAC Institute, an MS may be used in place of an LCS provided the acceptance criteria are as stringent. Since no MSs were run for uranium, arsenic, or selenium from our samples all SDGs were flagged MS-1 and could also not be used instead of the LCS.

Metals Serial Dilution
Since no serial dilution samples were run on the uranium, arsenic, or selenium samples in any of the SDGs, all the metals samples were flagged "J" for reason SD-1.

Detection Limits/Dilutions
Dilutions were prepared in a consistent and acceptable manner when they were required. The required detection limits were achieved for all analytes.

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

Electronic Data Deliverable Files
The EDD files arrived June 19, July 1, July 17, and November 10, 2020. The contents of the EDD were manually examined to ensure all and only the requested data were delivered in compliance with requirements and that the sample results accurately reflected the data contained in the sample data package.

3.3.2 Minimums and Maximums Report and Anomalous Data Review

The Minimums and Maximums Report for this sampling event is located in Appendix C. There was one anomalous data point, based on the ammonia result in the sample collected from well ATP-2-S which was more than 50% below the historical minimum.

Table 11. Anomalous Data Associated with the May/June 2020 Site-wide Sampling Event

Location	Sample Date	Analyte	Concentration (mg/L)	Historical Minimum (mg/L)	Historical Maximum (mg/L)	Disposition
ATP-2-S	06/02/2020	Ammonia Total as N	57	300	1130	The lab re-analyzed this sample, with a result of 49 mg/L. Concentration may have been impacted by nearby irrigation activities.

4.0 Results

4.1 February 2020 Crescent Junction Sampling Event Results

The collection of the sample from well 0202 (Figure 1) in February represents the second time this location was sampled since a sufficient volume of water for sample collection was first encountered in June 2019. Table 12 provides the analytical results from both the most recent and July 2019 sampling events for comparison purposes. With only two samples, it is difficult to determine any data trends. Taking into account the different detection limits, the February 2020 analyte concentrations are in general similar to the July 2019 results. The one significant exception is the sulfate concentration, which decreased from 28,000 to 19,000 mg/L. All the uranium (both the isotopic and metal form) concentrations were similar for the two samples. Based on this information, the source of the water migrating into well 0202 prior to February 2020 does not appear to be associated with the tailings placed in the cell, and has not changed since July 2019.

Table 13 displays the analytical results of the February 2020 samples collected from well 0205 (Figure 1), along with the results from the three previous sampling events in June 2018, October 2018, and March 2019. These results indicate the well 0205 analyte concentrations of the samples collected from well 0205 have generally not significantly changed.

Of note, the nitrate concentration decreased 27% (from 960 to 700 mg/L) since March 2019, with the February 2020 concentration just below the historical minimum (previously 710 mg/L in the sample collected in July 2015). During this same time interval the TDS concentration decreased 46% (from 39,000 to 21,000 mg/L), also establishing a new historical minimum (previously 24,000 mg/L in April 2016). Uranium isotopic and metal concentrations were all with the historical ranges. These results suggest the water sampled at this location does not appear to be associated with the tailings placed in the disposal cell, and the well continues to be recharged from the same water source.

Table 12. Crescent Junction Well 0202 Analyte Concentrations, July 2019 through February 2020

Analyte	Analyte Concentration on 07/11/19	Analyte Concentration on 02/26/20
Ammonia as N	14	15
Arsenic	0.0039#	0.039#
Bicarbonate as $CaCO_3$	1,200	1,100
Boron	1.5	1.4
Bromide	12	40#
Cadmium	0.00033#	0.003#
Calcium	410	390
Carbonate as $CaCO_3$	50#	20#
Chloride	7,200	6,000
Chromium	0.0051#	0.005#
Copper	0.0047	0.01#
Fluoride	1#	20#
Iron	0.050#	0.049#
Lead	0.0013#	0.013#
Magnesium	730	690
Manganese	0.44	0.51
Molybdenum	0.011#	0.011#
Nitrate/ Nitrite as N	450	520
Potassium	94	73
Selenium	0.027#	0.051
Sodium	8,900	9,400
Sulfate	28,000	19,000
Total Alkalinity as $CaCO_3$	1,200	1,100
Total Dissolved Solids	24,000	26,000
Uranium $_{234}$	37.2 +/- 6.6 pCi/L	42.9 +/- 7.3 pCi/L
Uranium $_{235}$	0.49 +/- 0.32 pCi/L	1.17 +/- 0.46 pCi/L
Uranium $_{238}$	8.2 +/- 1.8 pCi/L	10.9 +/- 2.1 pCi/L
Uranium	0.025	0.028

Notes: All concentrations in mg/L, except where noted, # = Concentration at or below the detection limit

Table 13. Crescent Junction Well 0205 Analyte Concentrations, June 2018 through February 2020

Analyte	Analyte Concentration on 6/27/18	Analyte Concentration on 10/03/18	Analyte Concentration on 03/19/19	Analyte Concentration on 02/26/20
Ammonia as N	13	22	13	12
Arsenic	0.039#	0.0039#	0.039#	0.039#
Bicarbonate as $CaCO_3$	1,100	1,100	1,100	960
Boron	1.4	1.1	1.4	1.2
Bromide	40#	20#	20#	40#
Cadmium	0.0033#	0.00033#	0.0033#	0.0033#
Calcium	370	300	330	290
Carbonate as $CaCO_3$	20#	100#	20#	20#
Chloride	3,400	3,900	3,500	3,000
Chromium	0.0051#	0.012	0.0051#	0.0051#
Copper	0.0097#	0.0047	0.0097#	0.0097#
Fluoride	20#	10#	10#	20#
Iron	0.049#	0.026	0.049#	0.049#
Lead	0.013#	0.0013#	0.013#	0.013#
Magnesium	1,000	1,000	820	710
Manganese	0.44	0.33	0.36	0.33
Molybdenum	0.011#	0.013	0.011#	0.011#
Nitrate/ Nitrite as N	940	860	960	700
Potassium	54	71	47	50
Selenium	4.4	4.1	3.1	2.9
Sodium	10,000	9,700	8,500	8,400
Sulfate	23,000	24,000	23,000	20,000
Total Alkalinity as $CaCO_3$	1,100	1,100	1,100	960
Total Dissolved Solids	46,000	41,000	39,000	21,000
Uranium 234	31.9 +/- 5.7 pCi/L	30.1 +/- 5 pCi/L	30.1 +/- 6 pCi/L	27.9 +/- 4.9 pCi/L
Uranium 235	0.64 +/- 0.37 pCi/L	0.56 +/- 0.19 pCi/L	1.45 +/- 0.75 pCi/L	0.59 +/- 0.33 pCi/L
Uranium 238	11.9 +/- 2.4 pCi/L	9.7 +/- 1.7 pCi/L	12.2 +/- 2.8 pCi/L	9.5 +/- 1.9 pCi/L
Uranium	0.037	0.029	0.025	0.027

Notes: All concentrations in mg/L, except where noted, # = Concentration at or below the detection limit

4.2 April 2020 CF4 and CF5 Sampling Event Results

The eight monitoring wells surrounding the CF4 wells (Figure 2) that inject freshwater into the subsurface were sampled in April. These samples were collected after the system injected more than 4.1 mil gal since the beginning of 2020. Operations were suspended in late March for the freshwater pond cleanout activities, and then the system was restarted at the end of March, with the samples collected one week later.

The CF4 wells are screened and deliver fresh water into the subsurface from 15 to 35 ft below ground surface (bgs). Ammonia concentrations associated with the downgradient samples collected from a depth less than 20 ft bgs (wells 0784 and 0785) were below the 0.2 mg/L detection limit, clearly indicating the injection system activity impacted this subsurface zone. The sample from the upgradient shallow zone (from well 0783) was also below the 0.2 mg/L detection limit, providing further evidence of the effectiveness of the system in decreasing contaminant concentrations in the shallow subsurface zone.

Samples collected from wells 0780 and 0786 (28 ft bgs) and well 0782 (collected from 33 ft bgs) had ammonia concentrations ranging from 34 to 370 mg/L. These samples represent the conditions near the bottom of the zone where the CF4 injection wells deliver fresh water into the subsurface when the system is active. From a depth of 36 to 46 ft bgs, the ammonia concentrations ranged from 1,600 to 1,800 mg/L (wells 0781 and 0787).

Ammonia concentrations are displayed on Figure 5 and presented in Table 14. Baseline concentrations represent sample results from August 2010, prior to sustained freshwater injection into this area of the groundwater system. It should be noted that the concentrations for wells 0781 and 0787 fluctuate (due to the depth of their screen interval), and are highly dependent upon the elevation of the freshwater/brine interface at the time the sampling occurs. During August 2010 the river flows were above average, and a freshwater lens was in place diluting concentrations at depth. Even though the April 2020 concentrations from wells 0781 and 0787 are above the baseline concentration, this is not indicative of the injection system performance.

Table 14. CF4 Monitoring Well Ammonia Concentrations, April 2020

Location	Sample Depth (ft bgs)	Upgradient or Downgradient of Injection Wells	Baseline* Concentration (mg/L)	April 2020 Ammonia Concentration (mg/L)
0780	28	Upgradient	520	34
0781	46	Upgradient	850	1,600
0782	33	Upgradient	1,100	370
0783	18	Upgradient	190	<0.2
0784	18	Downgradient	190	<0.2
0785	18	Downgradient	430	<0.2
0786	28	Downgradient	470	94
0787	36	Downgradient	410	1,800

Notes: * = Baseline concentrations taken from samples collected August 2010, prior to sustained injection system activities

Figure 6 displays the ammonia concentrations in samples collected down gradient from a depth of 18 ft bgs (wells 0784 and 0785) since 2016, along with the CF4 weekly injected volume. The 18 ft bgs depth is the most important in terms of being protective of any suitable habitat that may develop, since this depth is approximately the same elevation of the base of the main river channel. As the plot displays, even when the injection system operations are limited or suspended for long periods of time, in the shallow groundwater system downgradient of the CF4 injection wells the ammonia concentrations tend to remain low.

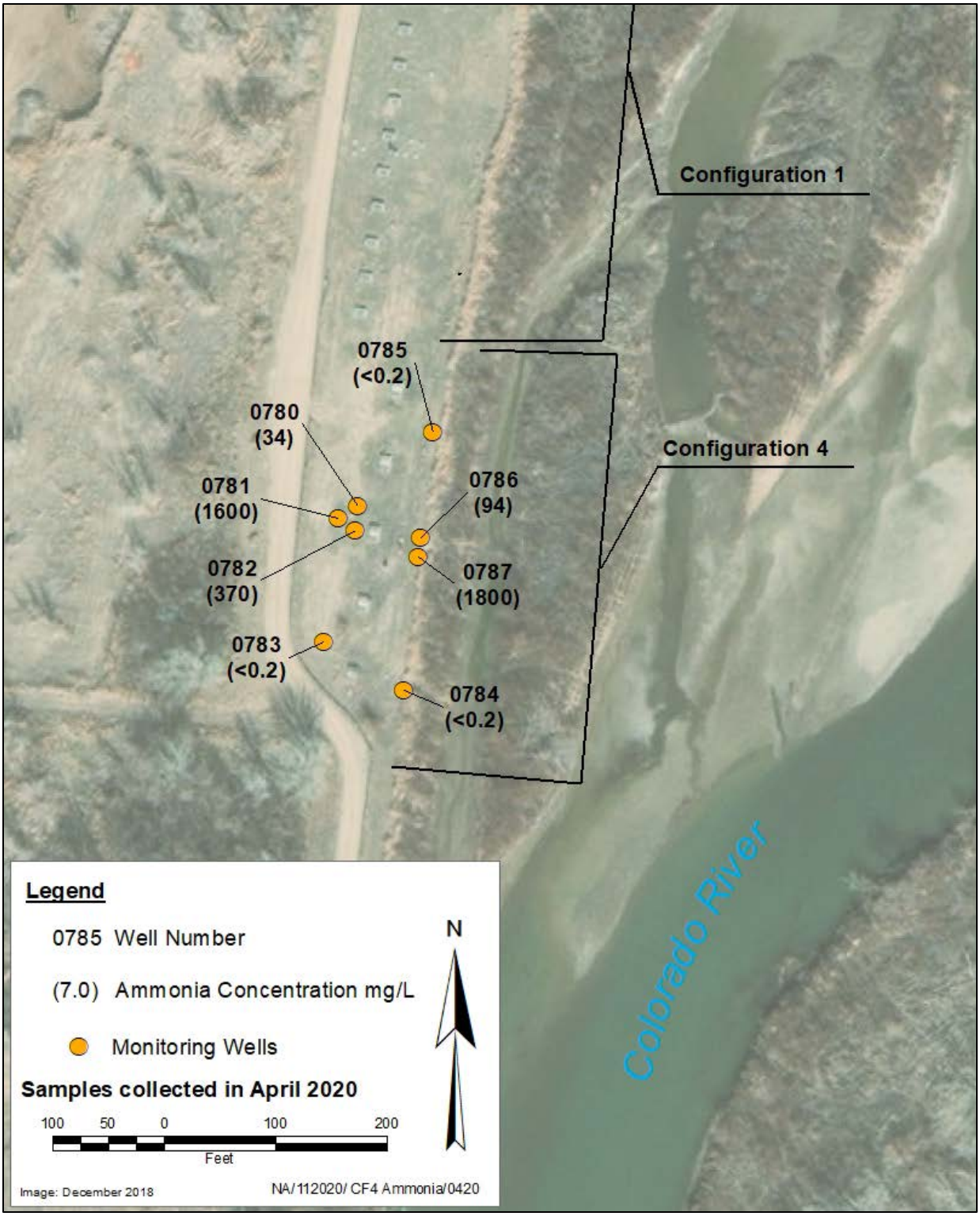

Figure 5. April 2020 CF4 Ammonia Groundwater Concentrations

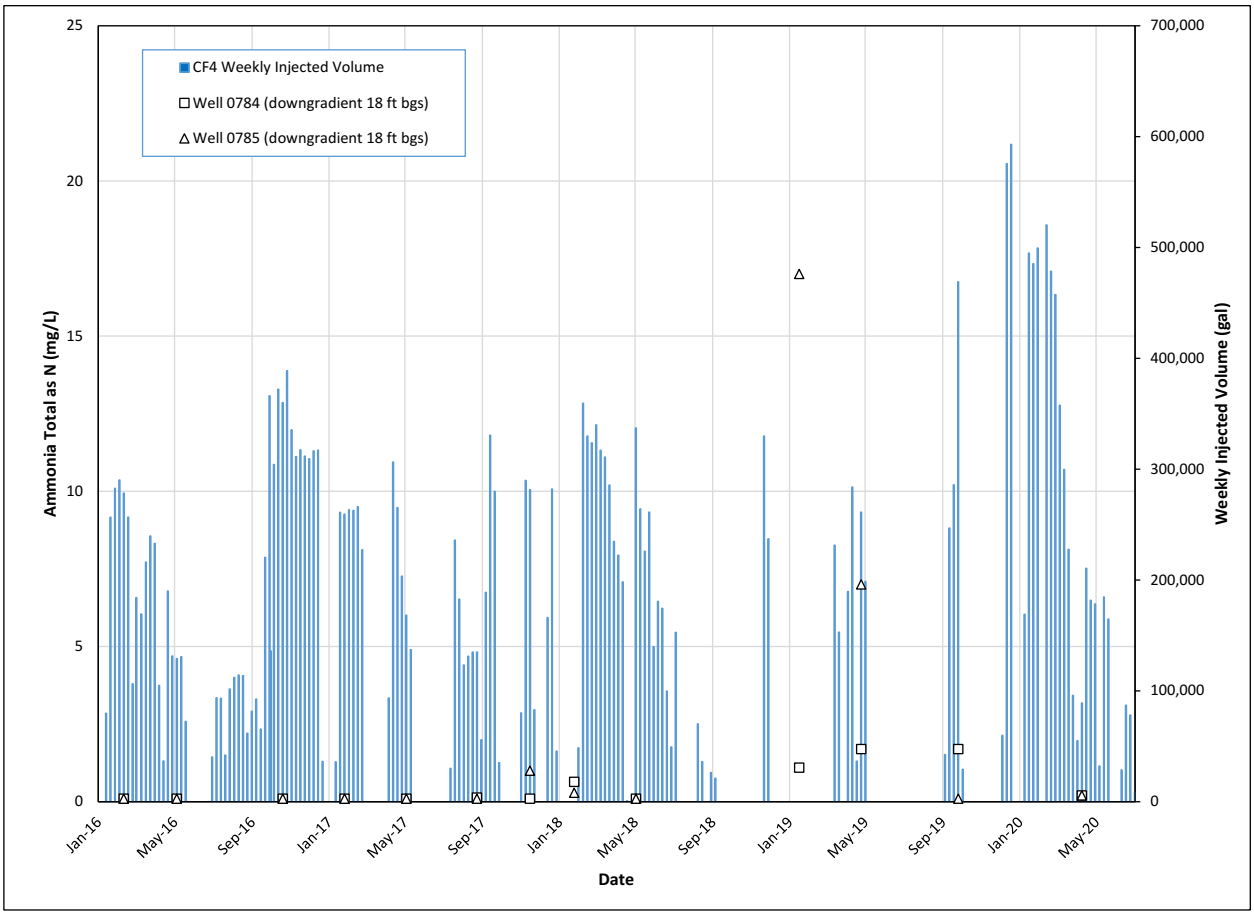

Figure 6. April 2020 CF4 Shallow Zone Ammonia Groundwater Concentrations in Response to Injection

Figure 7 presents the groundwater elevations generated as a result of the mounding developed during freshwater injection system operation in April 2020. The groundwater elevation data indicate there was groundwater mounding of nearly 12 ft between the elevation inside the CF4 0770 through 0779 injection wells and the surrounding monitoring wells.

Groundwater samples were also collected from the CF5 extraction wells (locations shown on Figure 2) in April 2020, just after the extraction system was re-started after being winterized for the previous four months. The groundwater extraction system had operated on a regular basis for approximately one month (and extracted approximately 830,000 gal) when the samples were collected. CF5 ammonia and uranium concentrations associated with this sampling event are displayed on Figure 8. Time versus concentration plots (Figures 9 through 12) were also generated to display trends of the CF5 extraction wells since June 2010, which nearly covers the timeframe these wells were actively extracting groundwater (they were brought online starting in April 2010).

Figure 9 is the time versus ammonia concentration plot for extraction wells 0810 through 0813 and SMI-PW02, all of which are located along the CF5 southeastern boundary. Figure 10 displays a time versus uranium concentration plot for the same set of wells. Figures 11 and 12 are the time versus ammonia and uranium concentration plots, respectively, for CF5 wells 0814 through 0816 (which are located closer to the base of the tailings pile).

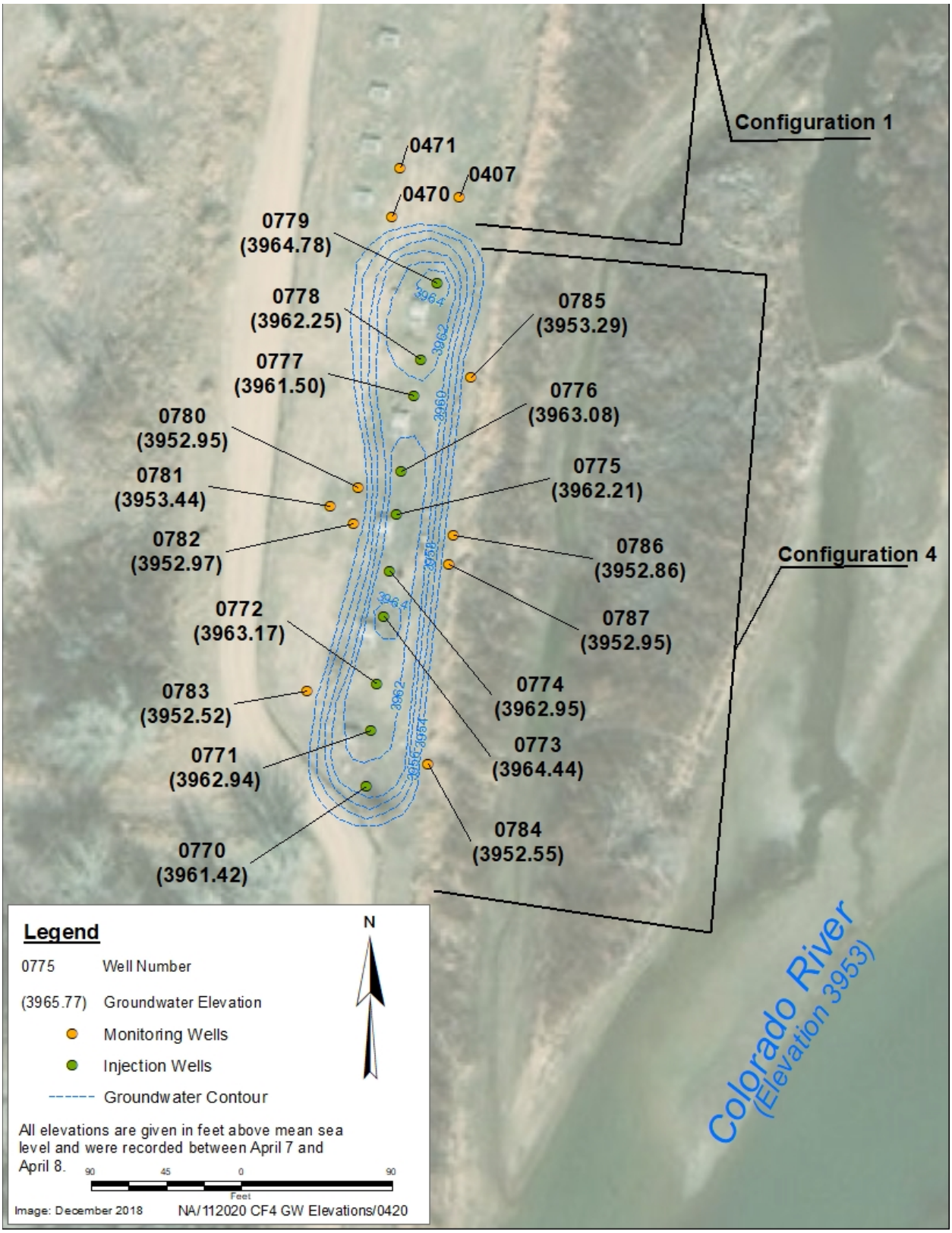

Figure 7. April 2020 CF4 Groundwater Elevations

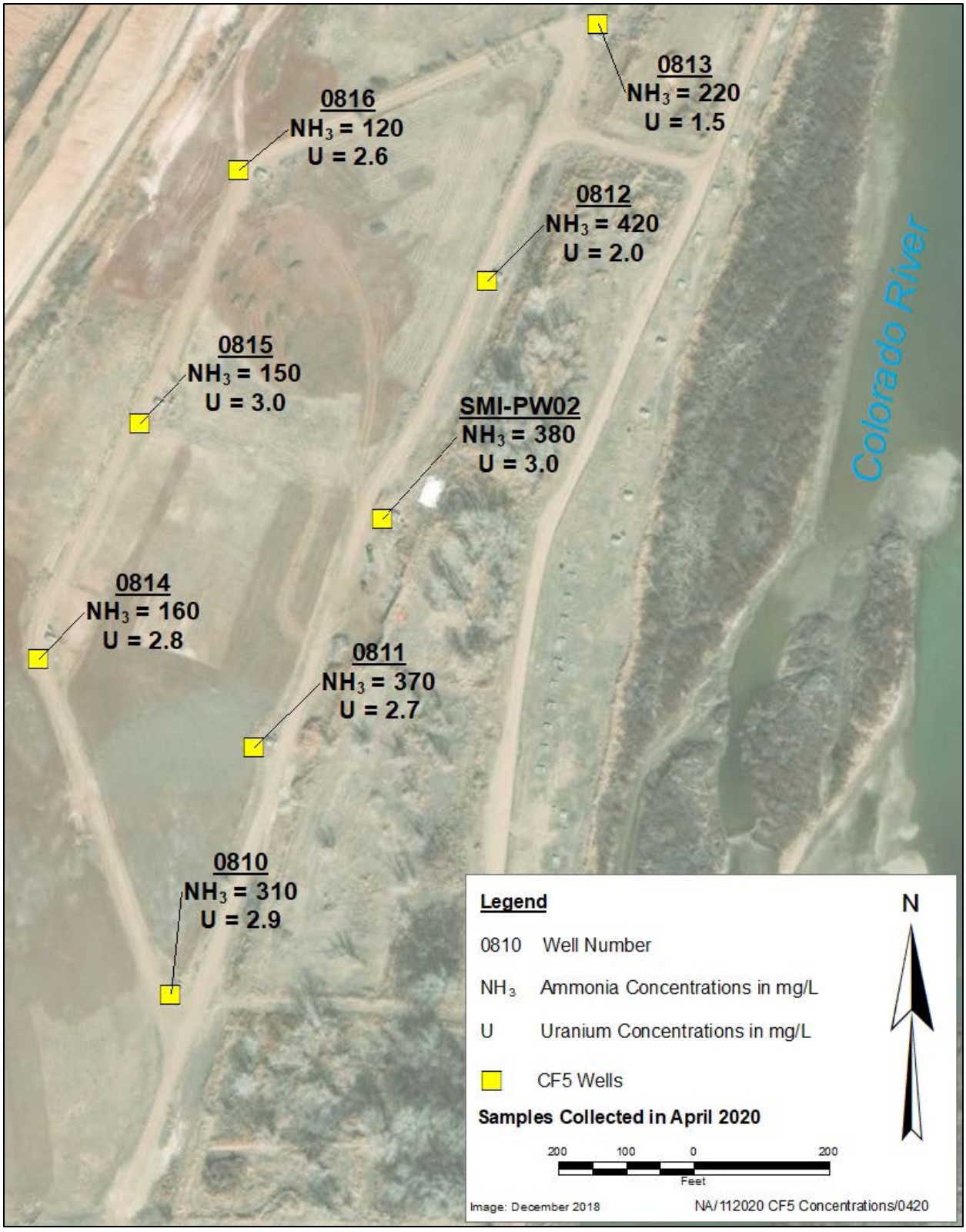

Figure 8. April 2020 CF5 Ammonia and Uranium Groundwater Concentrations

Trend lines applied to data collected since September 2010 from CF5 extraction wells indicate, with the exception of the samples collected from well 0813, that the ammonia concentrations are decreasing at a rate ranging from 2 to 21 mg/L/yr. Table 15 provides the geometric mean, standard deviation, 95% confidence interval, and the change in ammonia concentration based on the linear trend line for the CF5 extraction wells since 2010.

Table 15. Statistical Data for CF5 Extraction Well Ammonia Data, 2010 through 2020

Ammonia Concentrations (2010 – 2020)	CF5 Extraction Well							
	0810	0811	0812	0813	0814	0815	0816	PW02
Geometric Mean (mg/L)	321.9	410.0	423.9	334.4	192.9	205.8	171.5	468.2
Standard Deviation (mg/L)	31.8	54.8	63.5	90.2	46.8	75.5	27.8	49.8
95% Confidence Interval (mg/L)	14.7	26.0	29.3	41.7	22.2	34.9	13.6	22.4
Change in Concentration (mg/L/yr)	-4.0	-10.0	-2.0	11.0	-9.5	-21.0	-8.5	-12.5

The trend line associated with data collected from well 0813 indicates concentrations have been increasing over the past 10 years, at a rate of 11 mg/L/yr. This increase may be more the result of the historical low concentrations measured after the 2011 flooding event. Well 0813 is located in an area of the well field that remains submerged for an extended period of time after flood events. The concentrations measured after the 2019 flood event displayed a similar significant decrease.

Uranium concentrations in samples collected from wells along the CF5 southeastern boundary all increased a similar percentage (Figure 10) compared to the previous event, as did the concentrations measured in samples collected from the base of the tailings pile (Figure 12). During this most recent event, the uranium concentrations for all eight CF5 wells ranged from 1.5 to 3.0 mg/L, with the lowest concentrations associated with the wells located in the northeastern section of the well field (wells 0812 and 0813). Over the past four years the samples collected from well SMI-PW02 have had the highest uranium concentration.

Statistical data for the uranium results since 2010 are presented in Table 16. Trend lines applied to the uranium results over the past 10 years for all CF5 wells indicate two wells are on average decreasing up to 0.015 mg/L/yr, four wells have displayed an increase of up to 0.06 mg/L/yr, and two wells have not changed. The wells associated with the highest increase (wells 0813 and 0816 increased on average 0.06 and 0.03 mg/L/yr, respectively) are located at the northern end of CF5. Well 0813 has the lowest uranium concentration geometric mean over the past 10 ten years (1.5 mg/L).

Table 16. Statistical Data for CF5 Extraction Well Uranium Data, 2010 through 2020

Uranium Concentrations (2010 – 2020)	CF5 Extraction Well							
	0810	0811	0812	0813	0814	0815	0816	PW02
Geometric Mean (mg/L)	3.06	2.66	2.07	1.50	2.84	3.18	2.50	3.28
Standard Deviation (mg/L)	0.50	0.45	0.31	0.44	0.18	0.23	0.18	0.42
95% Confidence Interval (mg/L)	0.23	0.21	0.15	0.20	0.09	0.11	0.09	0.19
Change in Concentration (mg/L/yr)	-0.02	0.02	0.0	0.06	0.02	-0.01	0.03	0.0

The minimal increases of the uranium concentrations may be associated with the periodic influx of oxygenated water (during higher river stages) and the corresponding dissolution of uranium that is in the solid phase of the subsurface soils.

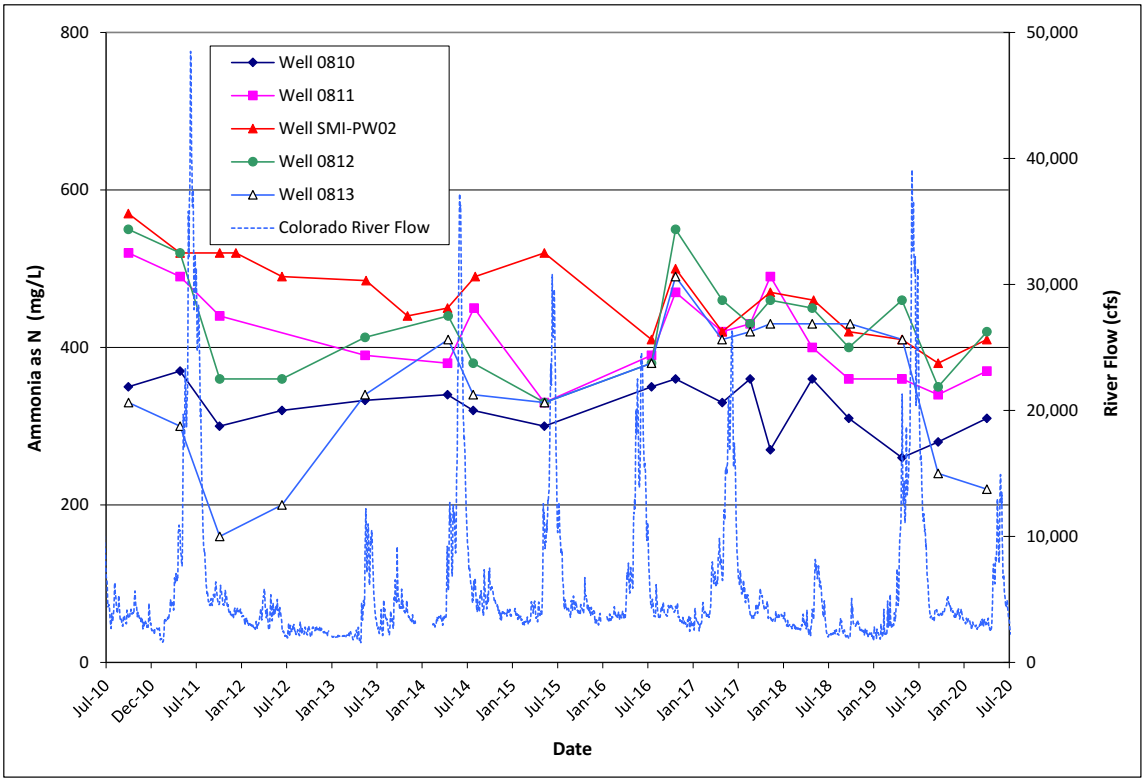

Figure 9. CF5 Extraction Wells 0810, 0811, 0812, 0813, and SMI-PW02 Time versus Ammonia Concentration Plot

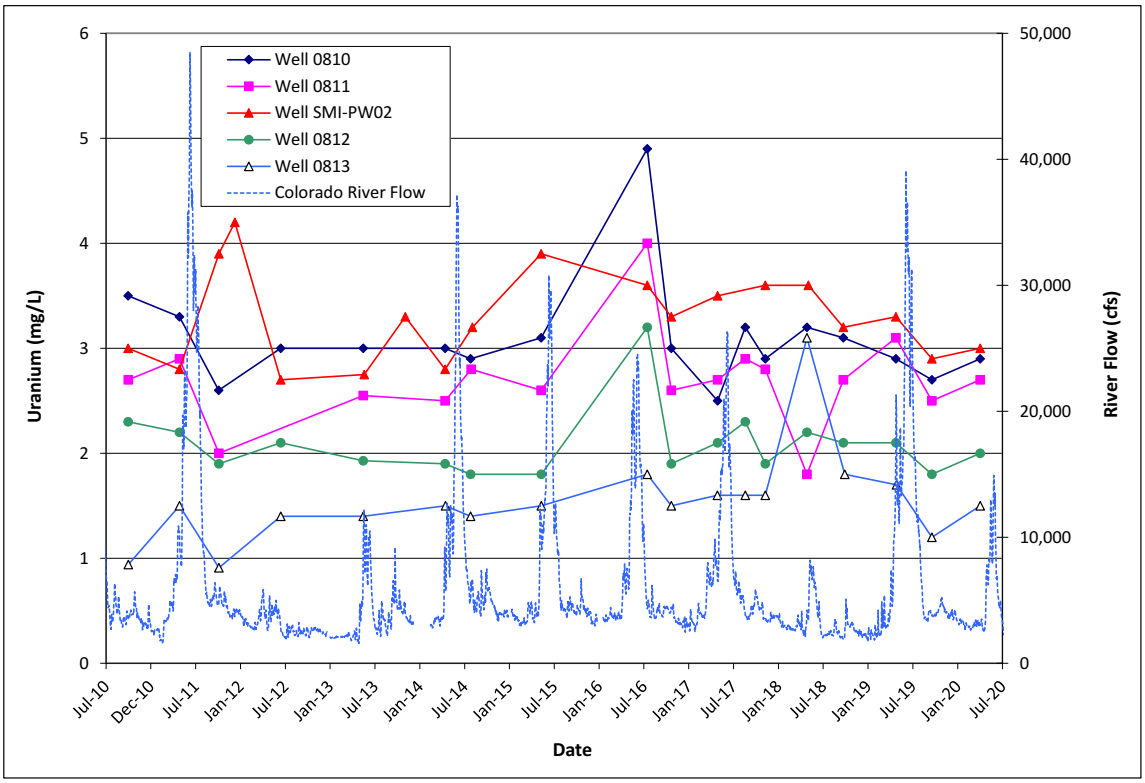

Figure 10. CF5 Extraction Wells 0810, 0811, 0812, 0813, and SMI-PW02 Time versus Uranium Concentration Plot

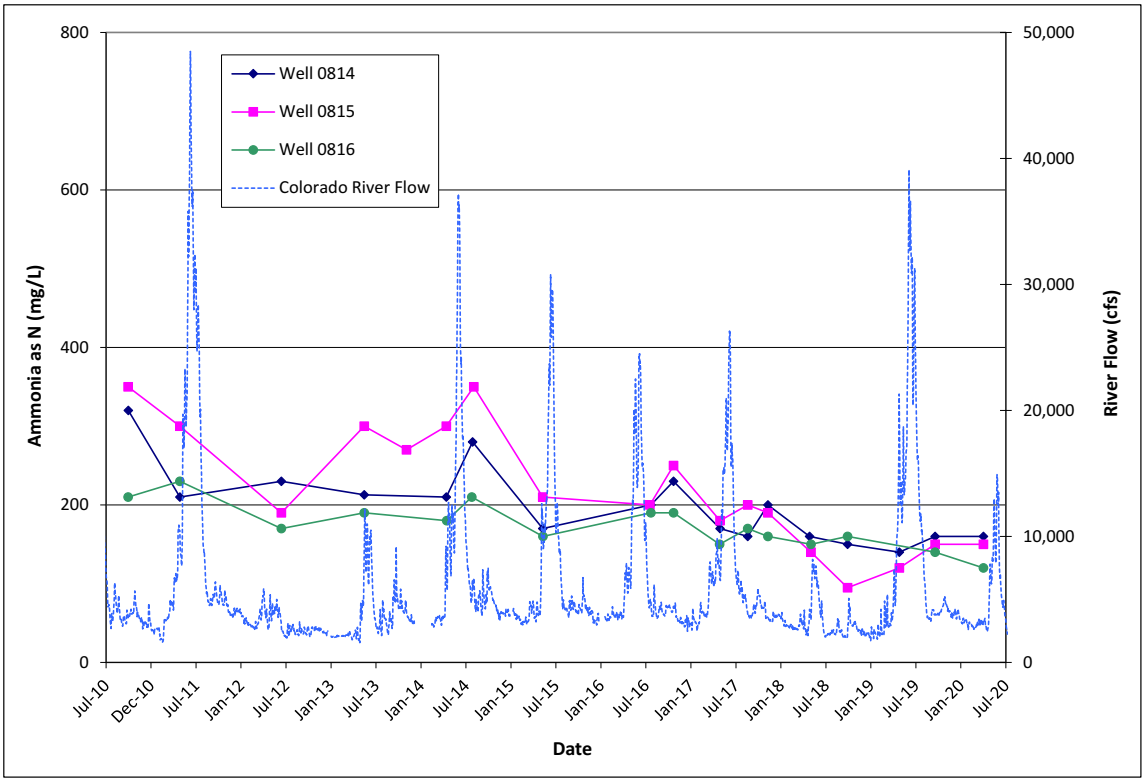

Figure 11. CF5 Extraction Wells 0814, 0815, and 0816 Time versus Ammonia Concentration Plot

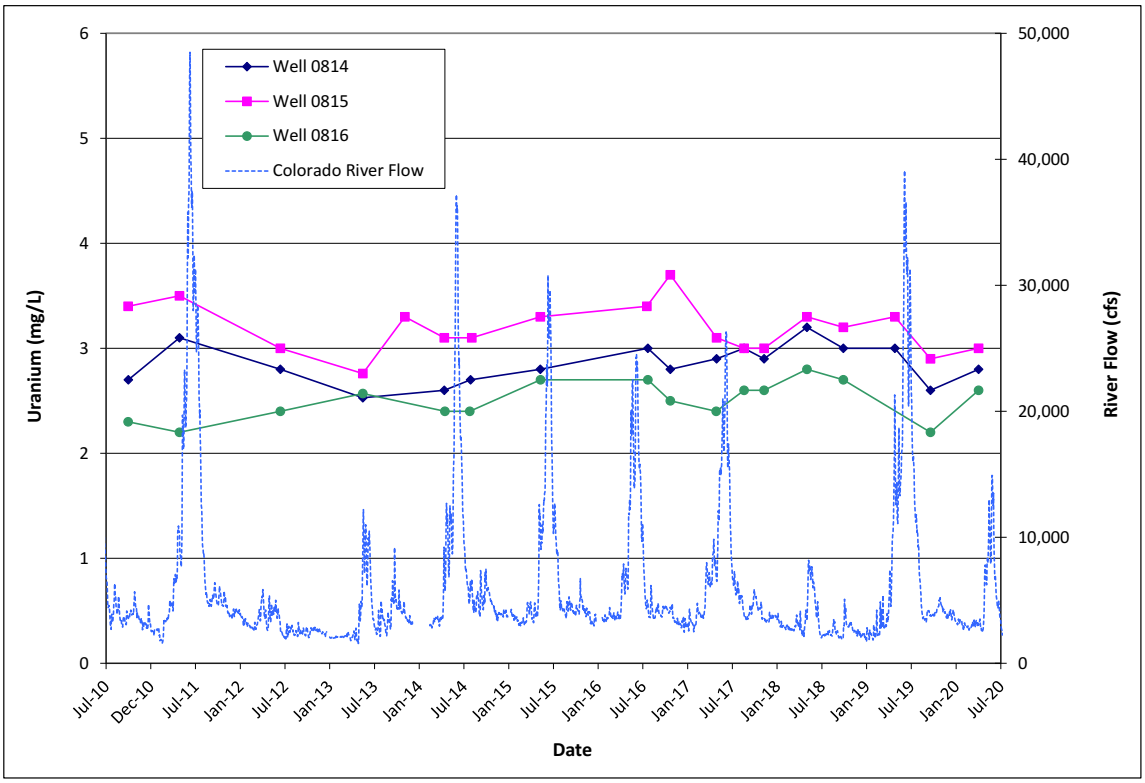

Figure 12. CF5 Extraction Wells 0814, 0815, and 0816 Time versus Uranium Concentration Plot

4.3 May/June 2020 Site-wide Sampling Event Results

All samples collected during this event were analyzed for both ammonia and uranium. Select locations were also analyzed for arsenic and selenium. There is no groundwater standard for ammonia; however, Table 17 presents all locations sampled that exceeded the 0.044 mg/L uranium groundwater standard. This standard is based on Table 1 in Title 40 Code of Federal Regulations Part 192 (40 CFR 192) "Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings, Subpart A, Standards for the Control of Residual Radioactive Materials from Inactive Uranium Processing Sites," assuming uranium-234 and uranium-238 activities are in equilibrium. Table 17 also includes the locations from the other sampling events from January to June 2020 that exceeded this concentration.

Table 17. January through June 2020 Sampling Events, Groundwater Locations Exceeding the 0.044 mg/L Uranium Groundwater Standard

Well Number	Date	Location	Sample Depth (ft bgs)	Uranium Concentration (mg/L)
0401	6/23/2020	CF2	18	1.4
0403	6/23/2020	CF1	18	0.92
0404	6/23/2020	CF3	18	1.4
0406	6/23/2020	CF1	18	1.0
0407	6/23/2020	CF1	18	1.1
0410	6/8/2020	NE Uranium Plume Area	23.5	0.56
0411	6/8/2020	NE Uranium Plume Area	8	0.68
0412	6/2/2020	NE Uranium Plume Area	10	2.9
0413	5/26/2020	NE Uranium Plume Area	10	3.0
0414	6/3/2020	NE Uranium Plume Area	7.5	3.1
0437	6/17/2020	On Tailings Pile	NA	2.5
0441	6/22/2020	Along SW Site Boundary	53	0.044
0453	6/10/2020	Along SW Site Boundary	80	0.77
0454	5/28/2020	Along SW Site Boundary	13	1.9
0492	6/11/2020	Along S Site Boundary	18	2.3
0780	4/7/2020	CF4	28	0.3
0781	4/7/2020	CF4	48	2.2
0782	4/7/2020	CF4	33	2.5
0783	4/7/2020	CF4	18	0.05
0786	4/7/2020	CF4	28	0.53
0787	4/7/2020	CF4	36	2.4
0810	4/8/2020	CF5 Extraction Well	10 to 40	2.9
0811	4/8/2020	CF5 Extraction Well	9 to 39	2.7
0812	4/8/2020	CF5 Extraction Well	14 to 44	2.0
0813	4/8/2020	CF5 Extraction Well	14 to 44	1.5
0814	4/8/2020	CF5 Extraction Well	12 to 42	2.8
0815	4/8/2020	CF5 Extraction Well	22 to 52	3.0
0816	4/8/2020	CF5 Extraction Well	21 to 51	2.6
AMM-2	6/3/2020	Near CF5	48	2.1

Table 17. January through June 2020 Sampling Events, Groundwater Locations Exceeding the 0.044 mg/L Uranium Groundwater Standard (continued)

Well Number	Date	Location	Sample Depth (ft bgs)	Uranium Concentration (mg/L)
MW-3	6/3/2020	Near CF5	44	2.8
SMI-MW01	6/2/2020	NE Uranium Plume Area	16	2.7
SMI-PW01	6/3/2020	CF5 Vicinity	40	2.0
SMI-PW02	4/8/2020	CF5 Extraction Well	20 to 60	3.0
SMI-PZ1D2	6/3/2020	CF5 Vicinity	73	1.8
SMI-PZ1M	6/3/2020	CF5 Vicinity	57	3.2
SMI-PZ1S	6/3/2020	CF5 Vicinity	18	0.83
SMI-PZ2D	6/17/2020	CF5 Vicinity	75	0.37
SMI-PZ2M2	6/17/2020	CF5 Vicinity	56	2.0
SMI-PZ3S	6/9/2020	NE Uranium Plume Area	25	0.93
TP-01	6/2/2020	NE Uranium Plume Area	22	0.05
TP-22	5/28/2020	NE Uranium Plume Area	17	0.58
TP-23	5/28/2020	NE Uranium Plume Area	25	2.4
UPD-17	6/8/2020	NE Uranium Plume Area	14	1.4
UPD-18	6/8/2020	NE Uranium Plume Area	13	1.0
UPD-20	6/9/2020	NE Uranium Plume Area	17	0.064
UPD-21	6/9/2020	NE Uranium Plume Area	25	7.2
UPD-22	5/26/2020	NE Uranium Plume Area	9	2.3
UPD-23	6/18/2020	NE Uranium Plume Area	26	0.8
UPD-24	6/9/2020	NE Uranium Plume Area	27	4.1

Notes: NE = northeastern; SW = southwestern

Tables 18 and 19 provide the locations that exceeded the EPA National Primary Drinking Water Standards for arsenic and selenium, respectively. Of the 17 select locations in which arsenic was analyzed, six exceeded the 0.01 mg/L standard.

Table 18. June 2020 Groundwater Locations Exceeding the Arsenic 0.01 mg/L EPA National Primary Drinking Water Standard

Well Number	Date	Location	Sample Depth (ft bgs)	Arsenic Concentration (mg/L)
0412	6/2/20	NE Uranium Plume Area	10	0.025
0414	6/3/20	NE Uranium Plume Area	10	0.017
SMI-PZ3S	6/9/20	NE Uranium Plume Area	25	0.020
UPD-17	6/8/20	NE Uranium Plume Area	14	0.020
UPD-18	6/8/20	NE Uranium Plume Area	13	0.020
UPD-24	6/9/20	NE Uranium Plume Area	27	0.23

The groundwater system underlying the site is not a drinking water source, and arsenic was analyzed for informational purposes only. These same locations will be sampled again during the subsequent sampling event as a best management practice to determine if they remain above the standard.

Nine of the 20 select (based on historical results) locations had selenium concentrations above the 0.05 mg/L standard. The results presented in Table 19 represent the second time selenium has been analyzed in samples from these locations since 2011. This analysis was also completed as a best management practice as the groundwater is not considered a drinking water source.

Table 19. June 2020 Groundwater Locations Exceeding the Selenium 0.05 mg/L EPA National Primary Drinking Water Standard

Well Number	Date	Location	Sample Depth (ft bgs)	Selenium Concentration (mg/L)
0411	6/8/20	NE Uranium Plume Area	8	0.12
0437	6/17/20	On Tailings Pile	NA	0.097
0440	6/10/20	Along NW Site Boundary	117	0.061
0453	6/10/20	Along SW Site Boundary	80	0.063
UPD-17	6/8/20	NE Uranium Plume Area	14	0.10
UPD-18	6/8/20	NE Uranium Plume Area	13	0.089
UPD-21	6/9/20	NE Uranium Plume Area	25	0.14
UPD-23	6/18/20	NE Uranium Plume Area	26	0.060
UPD-24	6/9/20	NE Uranium Plume Area	27	0.051

To more easily present the trends observed in the water chemistry for the site-wide locations, the site was divided into six areas. These include the northeastern base of the tailings pile, the northeastern uranium plume (which includes the PW03 cluster), the southeastern base of the tailings pile, along the southwestern boundary, along the Colorado River bank, and south of the site. All results since 2016 are also plotted against the Colorado River flow to determine if the river stage may impact the concentrations. Also included will be the response to CF5 extraction system activity on two nearby monitoring wells SMI-PZ2M2 (located in the same cluster as extraction well SMI-PW02), and well AMM-2 (located within 75 ft of extraction well 0813). All site-wide sampling locations are displayed in Figure 3.

4.3.1 Northeastern Base of Tailings Pile

Figures 13 and 14 are time versus ammonia and uranium concentration plots, respectively, for locations UPD-17 and UPD-18. Because of these location's proximity to the Colorado River and Moab Wash (in which the Colorado River tends to flood during peak runoff), ammonia concentrations have displayed a general trend of higher ammonia concentrations during river base flows and, conversely, lower concentrations during the spring runoff (or higher flows). This trend continues, as displayed in Figure 13. Even with the below average 2020 spring runoff, the ammonia concentrations decreased at both locations.

Uranium concentrations tend to increase during higher river stages, where oxygenated water enters the subsurface and increases the uranium solubility. This geochemical reaction is especially evident in the samples collected from well UPD-18. In response to the higher river stage, uranium concentrations increased during the most recent sampling event.

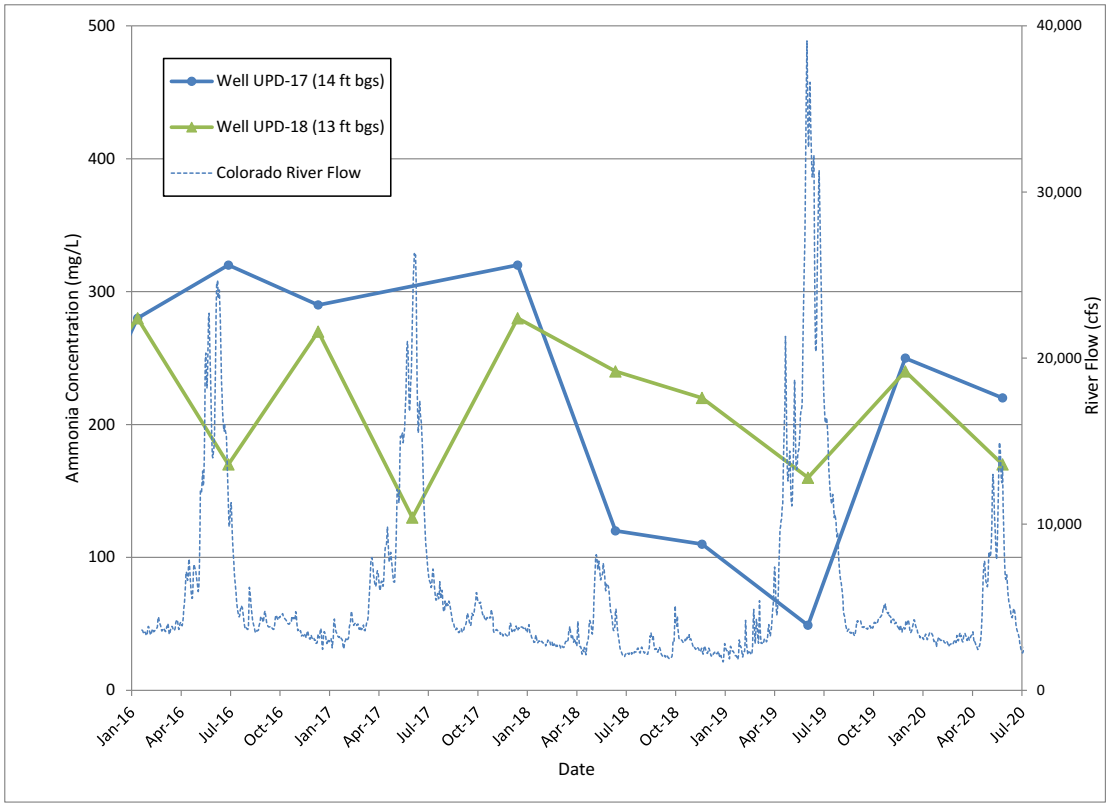

Figure 13. Wells UPD-17 and UPD-18 Time versus Ammonia Concentration Plot

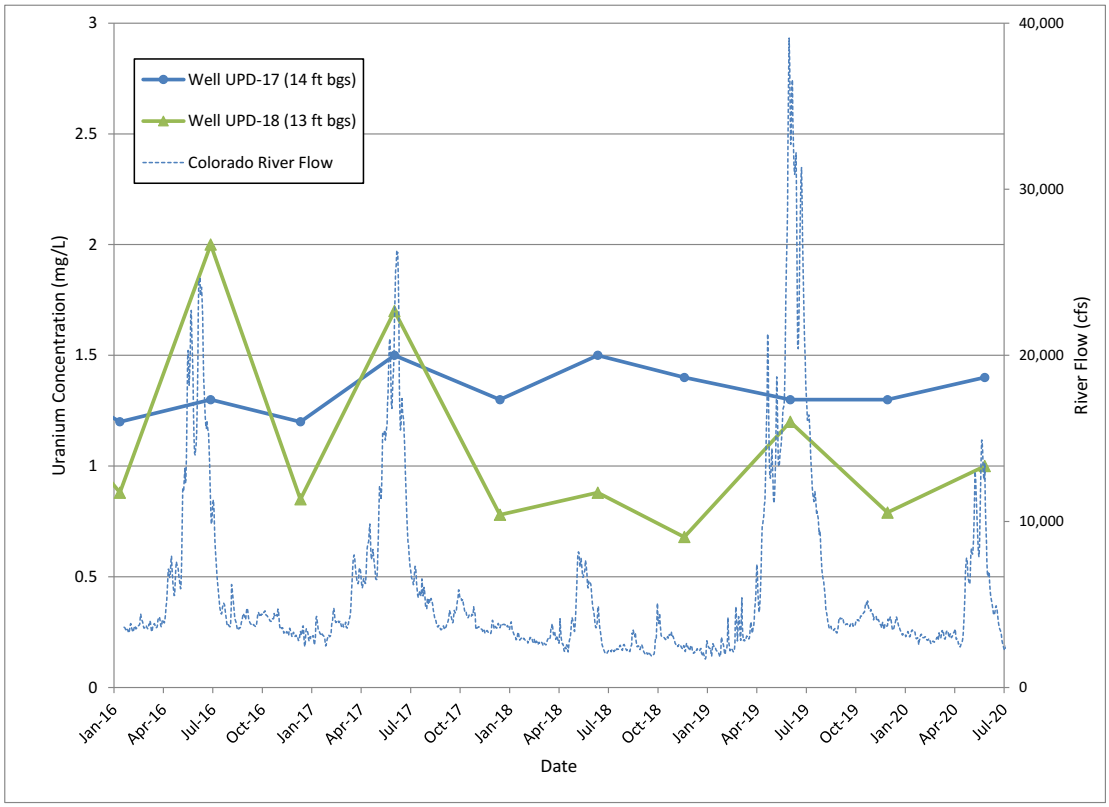

Figure 14. Wells UPD-17 and UPD-18 Time versus Uranium Concentration Plot

4.3.2 Northeastern Uranium Plume Area

Due to the number of wells associated with the northeastern uranium plume, this area of the site was further subdivided into the center of the plume, the vicinity of the Atlas building, and the northeastern edge of the plume area.

4.3.3 Center of Northeastern Uranium Plume Area

Figures 15 and 16 are the time versus ammonia and uranium concentration plots, respectively, for the center of the northeastern uranium plume area, which includes locations UPD-20, 0411, 0413, and 0414 (listed from upgradient to downgradient).

As displayed in Figure 15, the ammonia concentrations continue to remain below the detection limit in the samples collected from well UPD-20, which is the furthest upgradient location and outside of the ammonia plume. The concentrations in the sample from well 0411 are also below 5 mg/L, and during this event were within the historical range. Well 0413 is approximately 650 ft from the Colorado River, and the ammonia concentrations collected from this location are less susceptible to impacts of the river stage compared to well 0414 (located only 250 ft from the river) when this area is not flooded. Concentrations of samples collected from these two locations were also within the historical range.

The uranium concentration (Figure 16) in the sample collected from well UPD-20 was again just above the 0.044 mg/L standard (as it has been since this well was installed in 2011), with a concentration of 0.064 mg/L. Since 2016 the concentration has ranged from 0.056 to 0.068 mg/L. The uranium concentrations in samples collected from well 0413 and 0414 displayed the impacts of river water impacting the subsurface until the 2019 flood event. During that time, the area of the site where 0414 is located was submerged for an extended period of time the flood waters did not reach well 0413. In response to the flooding, the uranium concentration decreased in the sample collected in May 2019, suggesting the extended presence of oxygenated water may have resulted in precipitation of uranium in the subsurface and reducing the solubility. By the most recent event, the uranium concentrations in the samples collected from both wells increased in response to the 2020 below average peak flows. The sample collected from well 0411 remained below 1 mg/L, as it has since June 2017.

4.3.4 Atlas Building Vicinity

The ammonia and uranium concentrations associated with samples collected from locations in the vicinity of the Atlas building are displayed in Figures 17 and 18, respectively. These wells include 0410, UPD-21, UPD-23, and UPD-24, all of which were sampled at a depth of approximately 25 ft bgs.

As shown in Figure 17, the ammonia concentrations in these samples were all less than 5 mg/L. Analytical results indicate that the concentration in the sample from well 0410 during the most recent event remained below less than 1 mg/L, suggesting the plume has not migrated to the northeast in this area of the site since 2009. A sample collected from well UPD-21 decreased to 4.5 mg/L from 20 mg/L in December 2019. The reason for this fluctuation is unknown, while the ammonia concentrations in the samples collected from UPD-23 and -24 have remained consistent since 2012.

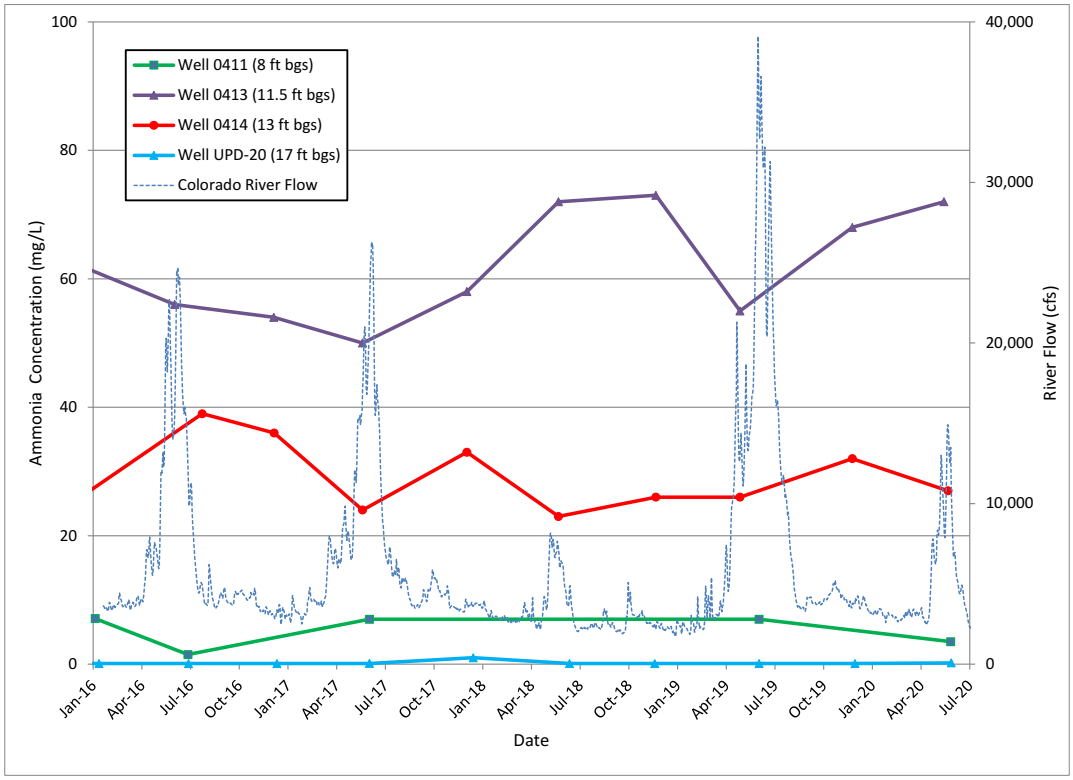

Figure 15. Center of Northeastern Uranium Plume Area Observation Wells 0411, 0413, 0414, and UPD-20 Time versus Ammonia Concentration Plot

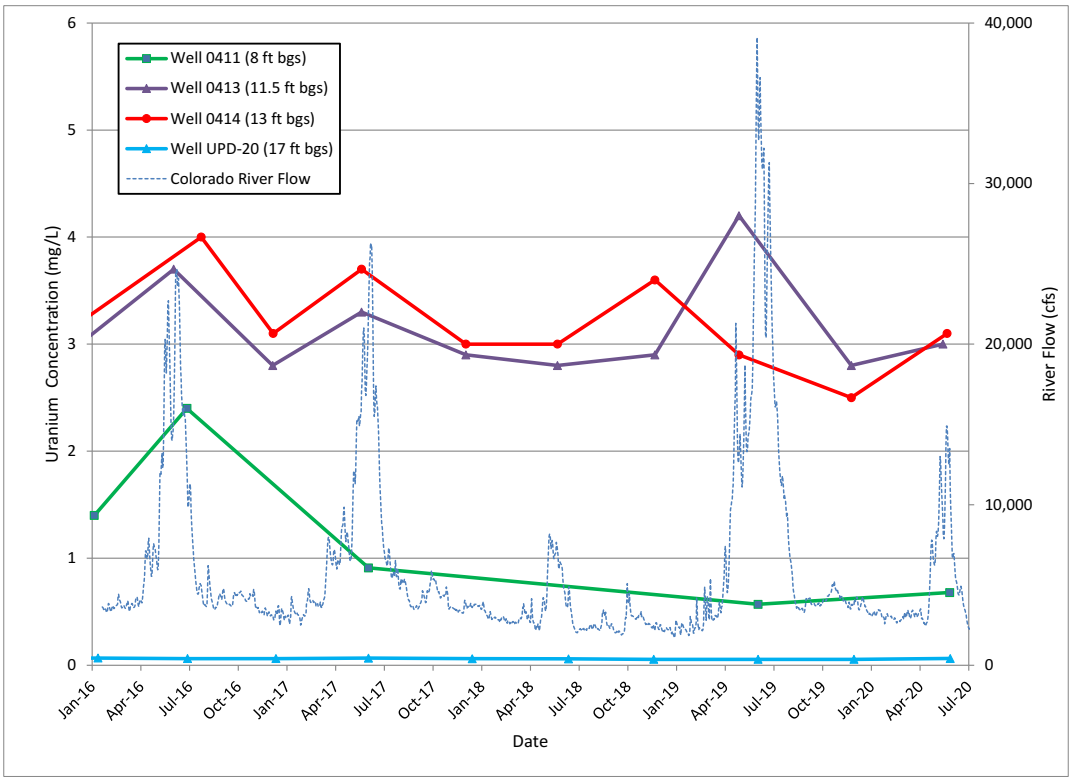

Figure 16. Center of Northeastern Uranium Plume Area Observation Wells 0411, 0413, 0414, and UPD-20 Time versus Uranium Concentration Plot

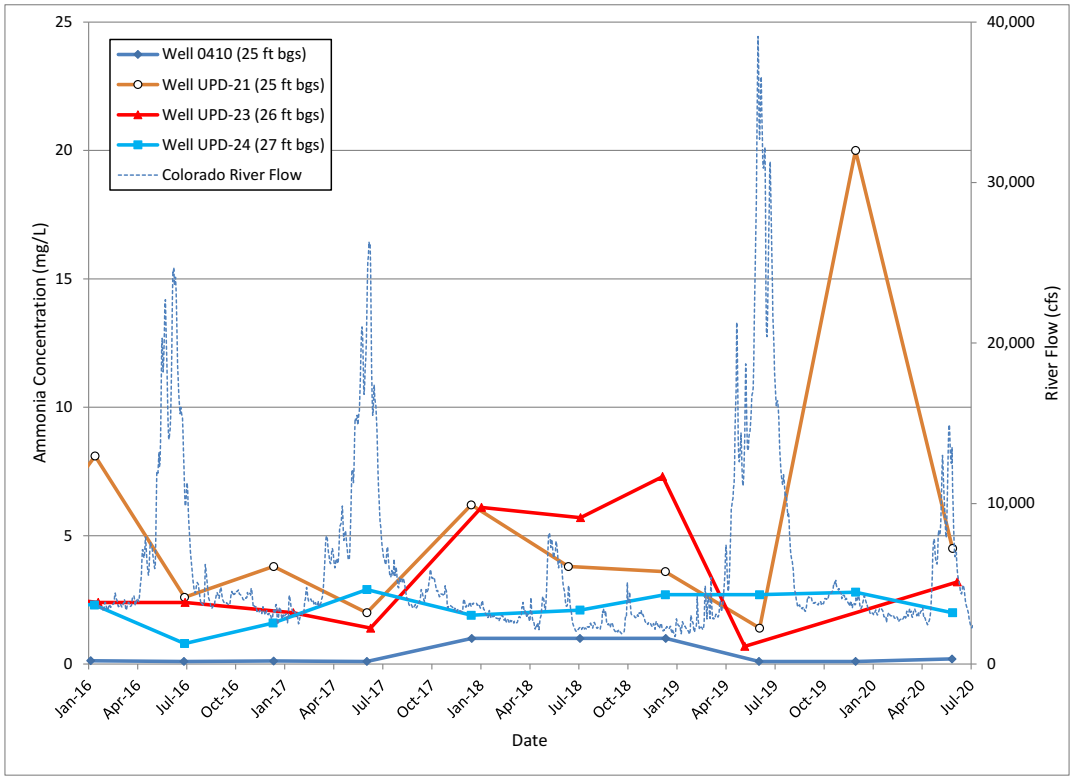

Figure 17. Vicinity of Atlas Building Observation Wells 0410, UPD-21, UPD-23, and UPD-24 Time versus Ammonia Concentration Plot

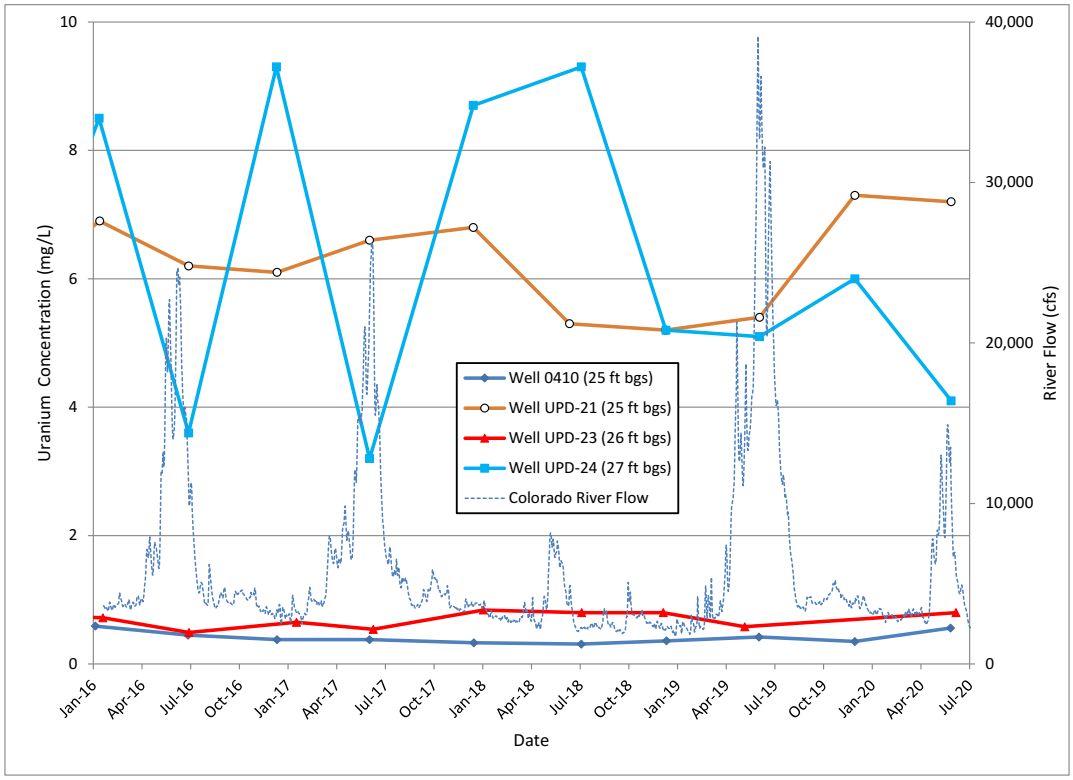

Figure 18. Vicinity of Atlas Building Observation Wells 0410, UPD-21, UPD-23, and UPD-24 Time versus Uranium Concentration Plot

Historically this area of the site has had the highest uranium concentrations in groundwater, particularly in wells UPD-21 and -24. The uranium concentrations (Figure 18) in samples collected from wells 0410 and UPD-23 remain lower than 1.0 mg/L and have not significantly changed since 2012, suggesting the uranium plume has not extended to the north/northeast during this time. Since 2012 the concentrations in the samples collected from UPD-24 have for the most part doubled over the winter months compared to the summer months. Figure 18 suggests that the concentrations are potentially diluted during the summer months by upgradient recharge to the groundwater system. Groundwater elevation data (which can fluctuate up to 5 ft between the summer and winter sampling events) provides additional evidence, with lower groundwater elevations resulting in higher uranium concentrations.

After reaching a site-wide maximum uranium concentration of 18 mg/L in 2014, samples collected from UPD-21 have since ranged from 5.2 to 7.3 mg/L. Groundwater surface elevations in the vicinity of well UPD-21 (located approximately 300 ft upgradient of UPD-24) have fluctuated as much as 3 ft between the winter and summer. The samples collected from this location do not display as strong of a correlation between the elevation and uranium concentrations.

4.3.5 Northeastern Edge of Uranium Plume Area

Figures 19 and 20 display ammonia and uranium concentration data for the wells located in the vicinity of the northeastern edge of the plume area. This includes wells SMI-PZ3S, UPD-22, 0412 and SMI-MW01 (listed from upgradient to downgradient). Well SMI-PZ3S is located approximately 850 ft from the river bank, and SMI-MW01 is only 50 ft off the bank. Well 0412 is only approximately 60 ft upgradient of SMI-MW01, but sampled at different depths (11 and 16 ft bgs, respectively).

As Figure 19 exhibits, the ammonia concentrations associated with the sampling of these wells increases moving away from the river bank. The fluctuations displayed in the concentrations associated with 0412 are a function of detection limits. The concentrations measured in the samples collected from SMI-MW01, 0412, and SMI-PZ3S have remained low, suggesting this area represents the edge of the ammonia plume. Ammonia concentrations in this area have been below 10 mg/L since 2011. Through 2015 the concentrations measured in samples collected from well UPD-22 were below 5 mg/L, and the plot suggests some minor plume movement since 2016.

With this set of wells located downgradient of the Atlas Building and former processing area (Section 4.3.4), the uranium concentrations are impacted by the upgradient conditions. However, consistently the uranium concentrations measured in the samples collected from the well closest to the Atlas Building cluster (SMI-PZ3S) are the lowest of this set of wells. Additionally well SMI-PZ3S is only approximately 200 ft from UPD-24 (Section 4.3.4), but the concentrations are significantly different (0.93 and 4.1 mg/L, respectively), during this most recent event even though the sample depths are similar (25 and 27 ft bgs). As shown in Figure 20, moving in the southeast (downgradient) direction concentrations increase, with the highest near the river bank. As with the ammonia concentrations, the samples collected from wells 0412 and SMI-MW01 are essentially the same. The concentration increase in the downgradient direction suggests the uranium plume is being impacted by another source, possibly the remnants of the berm that was in place during mill site operations through 2011 This area of the site and the berm were an identified source of subsurface contamination.

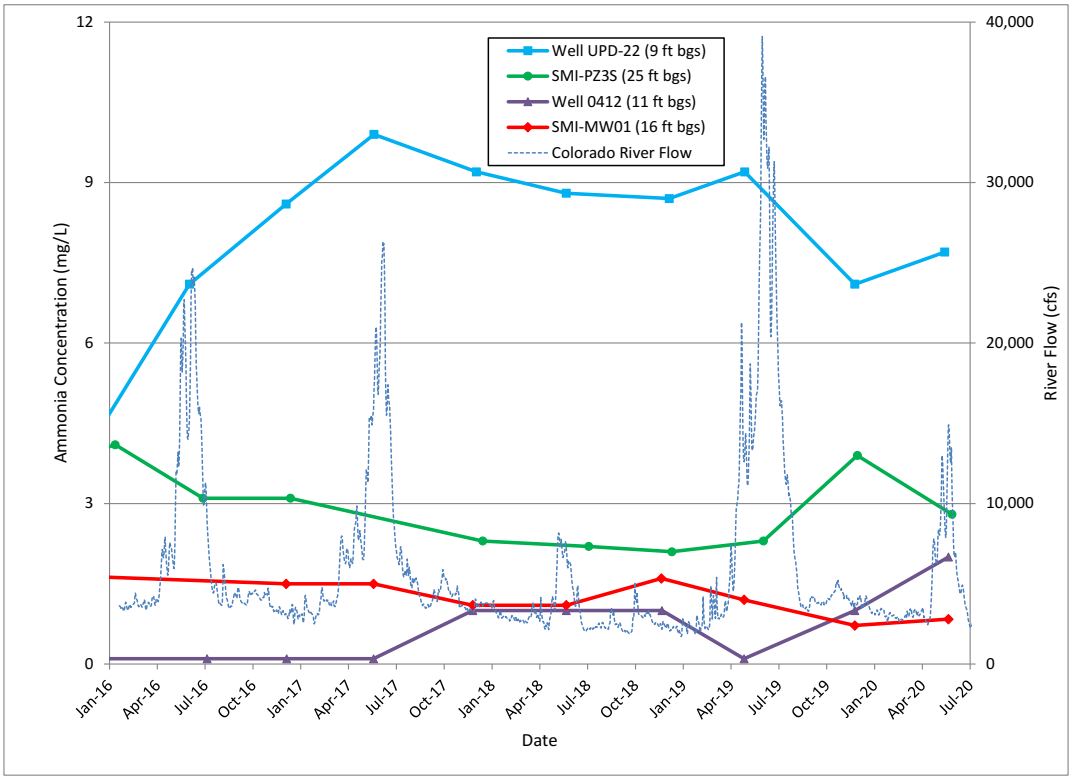

Figure 19. Northeastern Edge of Uranium Plume Area Observation Wells 0412, SMI-MW01, SMI-PZ3S, and UPD-22 Time versus Ammonia Concentration Plot

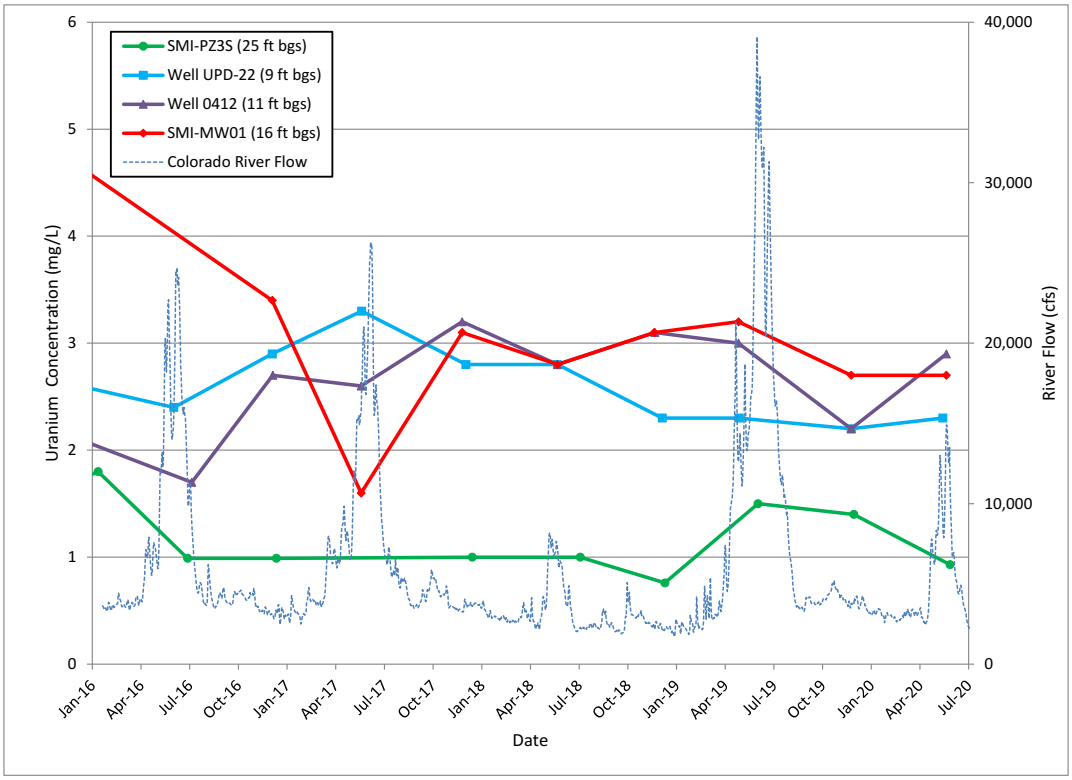

Figure 20. Northeastern Edge of Uranium Plume Area Observation Wells 0412, SMI-MW01, SMI-PZ3S, and UPD-22 Time versus Uranium Concentration Plot

4.3.6 Base of Tailings Pile

The time versus ammonia and uranium concentration plots for the area near the base of the tailings pile are presented in Figures 21 and 22 for wells 0454, AMM-3, ATP-2-S, ATP-2-D, and MW-3 (listed from south to north). As displayed in the legend in Figure 21, these wells are sampled over a variety of depths, ranging from 13 to 88 ft bgs. They are also located at approximately the same ground surface elevation. A sample was not collected during this most recent event from AMM-3.

Starting from the southern corner of the base of the pile, the samples collected 13 ft bgs from well 0454 provide ammonia concentrations in the shallowest zone. The plot displays how this zone of the plume is impacted by the river stage, with a significant decrease when the river is experiencing spring runoff flows. Because this well is located in a slight depression off the southern tip of the pile, it is susceptible to being submerged during flood events (most recently in 2019). Between July 2017 and January 2019 ammonia concentrations were comparable to those in samples collected from other wells along the tailings pile base, approximately 400 mg/L. The concentration decreased to 55 mg/L during the 2019 flood, and has rebounded over the last two sampling events.

Wells ATP-2-S and ATP-2-D are contained within a well cluster that is located near the center of the tailings base. Historically concentrations have been similar from depths of 25 and 88 ft bgs. This not only provides a general idea of the depth the plume, but also suggests there is minimal impact from the river stage on the ammonia plume down to a depth of at least 25 ft bgs. However, during this last sampling event the ATP-2-S ammonia concentration decreased significantly, while the ATP-2-D concentration was within the historical range. The river flows when the samples were collected during the June 2019 and June 2020 were similar, so that does not appear to impact the results. Well MW-3 is located near the northeastern end of the plume, and ammonia concentrations in samples collected at this location are similar and tend to mimic those associated with the ATP-2 cluster.

Starting from the southern end of the pile, well 0454 displays the impact of the river stage on the uranium concentration in the shallowest zone (Figure 22). Uranium concentrations decrease in response to high river flows. During times when peak flows are below average, the concentration is approximately 1.5 mg/L (the maximum concentration measured at this location was 2.6 mg/L in 2012). Uranium concentrations in wells ATP-2-S and ATP-2-D have all been less than 0.015 mg/L since 2010. One would expect these concentrations to be higher, especially in the sample associated with ATP-2-S (from 25 ft bgs), since the samples collected along the base of the tailings between 13 (0454) and 44 ft bgs (MW-3) range from 1.9 to 2.8 mg/L.

4.3.7 Southwestern Boundary

Figures 23 and 24 are time versus concentration plots for ammonia and uranium, respectively, for locations 0441, 0440, 0453, and 0454 (listed from northwest to southeast). These locations are all along the furthest western extent of the alluvial aquifer. Due to the varying topography along this boundary, sample depths range from 13 to 117 ft bgs. The results associated with well 0454 are again presented in this section because in addition to being located along the base of the tailings pile, it is also along this site boundary.

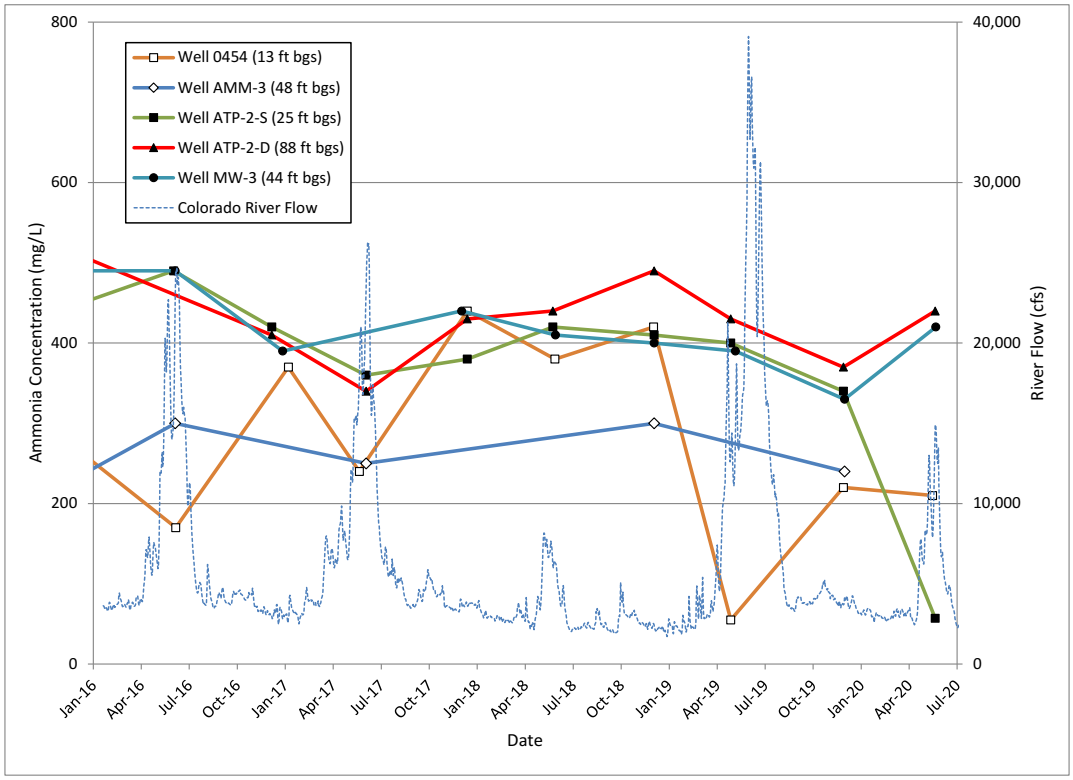

Figure 21. Base of Tailings Pile Observation Wells 0454, AMM-3, ATP-2-S, ATP-2-D, and MW-3 Time versus Ammonia Concentration Plot

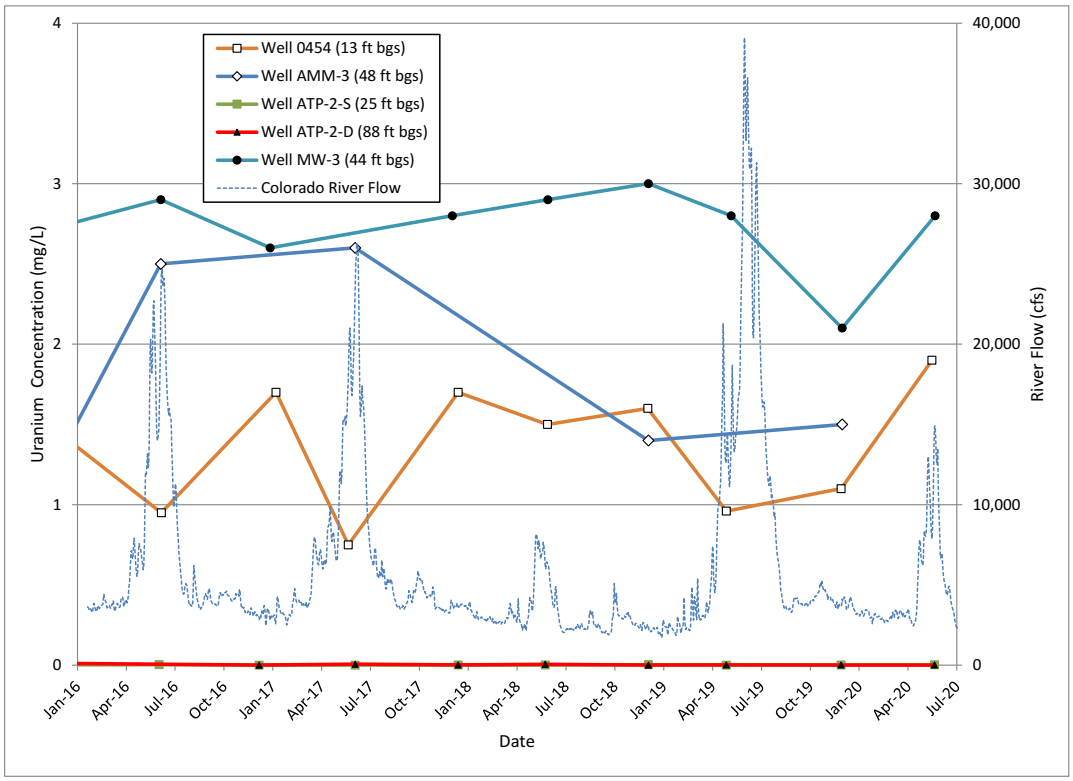

Figure 22. Base of Tailings Pile Observation Wells 0454, AMM-3, ATP-2-S, ATP-2-D, and MW-3 Time versus Uranium Concentration Plot

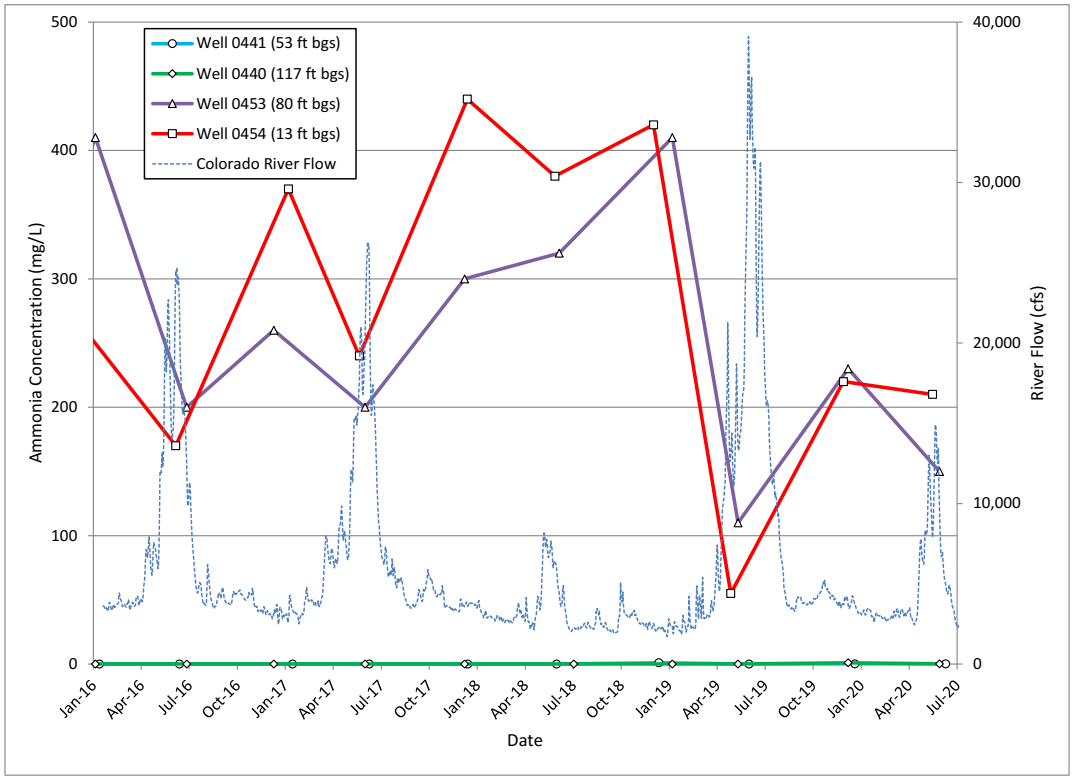

Figure 23. Southwestern Boundary Observation Wells 0453, 0454, and 0440 Time versus Ammonia Concentration Plot

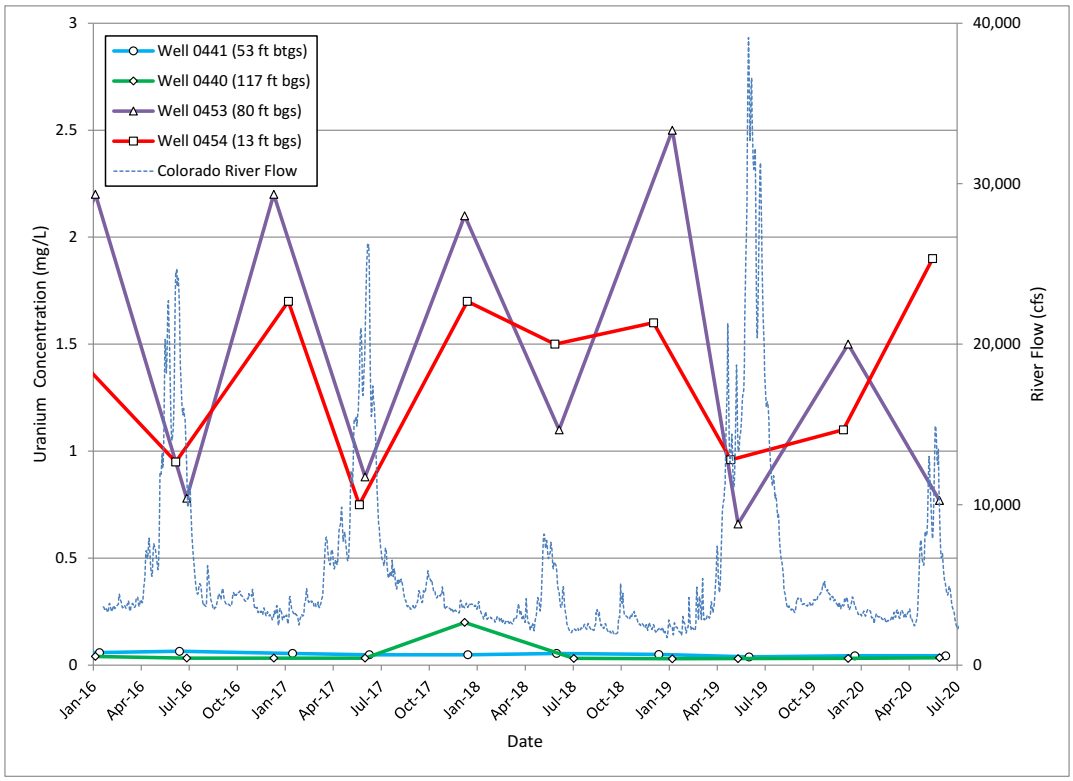

Figure 24. Southwestern Boundary Observation Wells 0453, 0454, and 0440 Time versus Uranium Concentration Plot

Both wells 0441 and 0440 are located upgradient of the ammonia plume, and there has been no evidence of plume migration since these wells were installed (2002 and 2010, respectively). Ammonia concentrations and fluctuations are similar in the samples collected from 0453 and 0454 (Figure 23). The river stage data plotted with the concentrations suggests the river stage impacts 0454 concentrations (as discussed in Section 4.3.7). However, well 0453 is located more than 2,400 ft from the river, while 0454 is approximately 1,100 ft away, but in a surface depression that remains submerged during flood events. This response suggests that recharge may also impact this region of the plume.

Wells 0453 and 0454 uranium concentrations (Figure 24) display significant fluctuations similar to the ammonia concentrations. The sample collected from well 0440 (0.035 mg/L) is below the 0.044 mg/L uranium UMTRA standard, and the 0441 concentration measured from the sample collected during this most recent event is equal to the standard. The data suggests there has been minimal change in the northwest corner of the plume.

4.3.8 Riverbank Area

Figures 25 and 26 are the time versus ammonia and uranium concentration plots, respectively, for the locations sampled along the riverbank. Wells TP-17, 0492, 0407, 0401, 0404, SMI-MW01, and TP-01 (listed from the south to the north) were sampled from depths ranging from 17 to 28 ft bgs. Because these wells are located along the riverbank, the water chemistry has historically been heavily influenced by the Colorado River stage fluctuations.

The results presented in Figure 25 suggest the ammonia plume has migrated to the south, based on the sample data collected from well 0492. Between November 2011 and January 2017 the ammonia concentrations associated with this location were below 10 mg/L. Since that time the concentrations have ranged from 16 to 250 mg/L, with the most recent sample having a concentration of 230 mg/L (the concentration decreased to 79 mg/L in response to the 2019 flooding event). It is possible that this increase is in response to low river stages between August 2017 and April 2019, allowing for uninhibited migration from the upgradient plume source. Ammonia concentration increases also occurred in the samples collected from wells 0401, 0407, and especially well 0404, which increased from 380 to 670 mg/L during this same timeframe. The lowest ammonia concentrations were associated with the samples collected from the wells TP-17, SMI-MW01, and TP-01. The data suggests the plume is contained within the area bounded to the south by TP-17 and between SMI-MW-01 and TP-01 to the north.

As displayed in Figure 26, the uranium concentrations from wells 0492 and 0407 have also increased between August 2017 and April 2019. The uranium concentrations in samples collected from 0401 and 0404 have remained consistent over the past five years (both between 1 and 2 mg/L), suggesting no significant plume migration in this area of the plume. Of this set of wells, the concentrations associated with SMI-MW01 (located downgradient of the northeast uranium plume) have been the highest, ranging from 1.6 to 6 mg/L since 2009. The results suggests the uranium plume is bounded to the south near the location of well TP-17, where uranium concentrations have ranged from 0.012 to 0.037 since 2009. To the north, the results indicate the plume extent is in the vicinity of well TP-01, where the uranium concentrations have been below 0.1 mg/L since 2009, but above or just below the 0.044 mg/L UMTRA standard. This most recent event the sample from this location was 0.05 mg/L. These data indicate the plume has not significantly migrated to the north or south in the past 10 years.

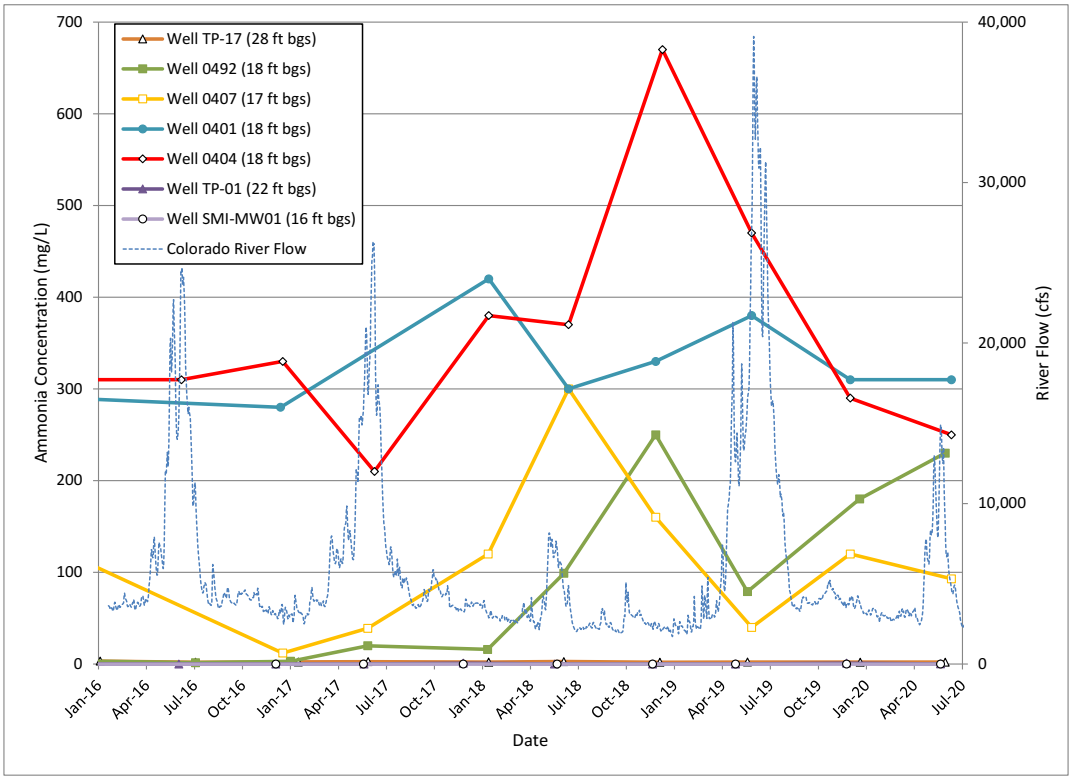

Figure 25. Riverbank Observation Wells TP-17, 0492, 0407, 0401, 0404, SMI-MW01, and TP-01 Time versus Ammonia Concentration Plot

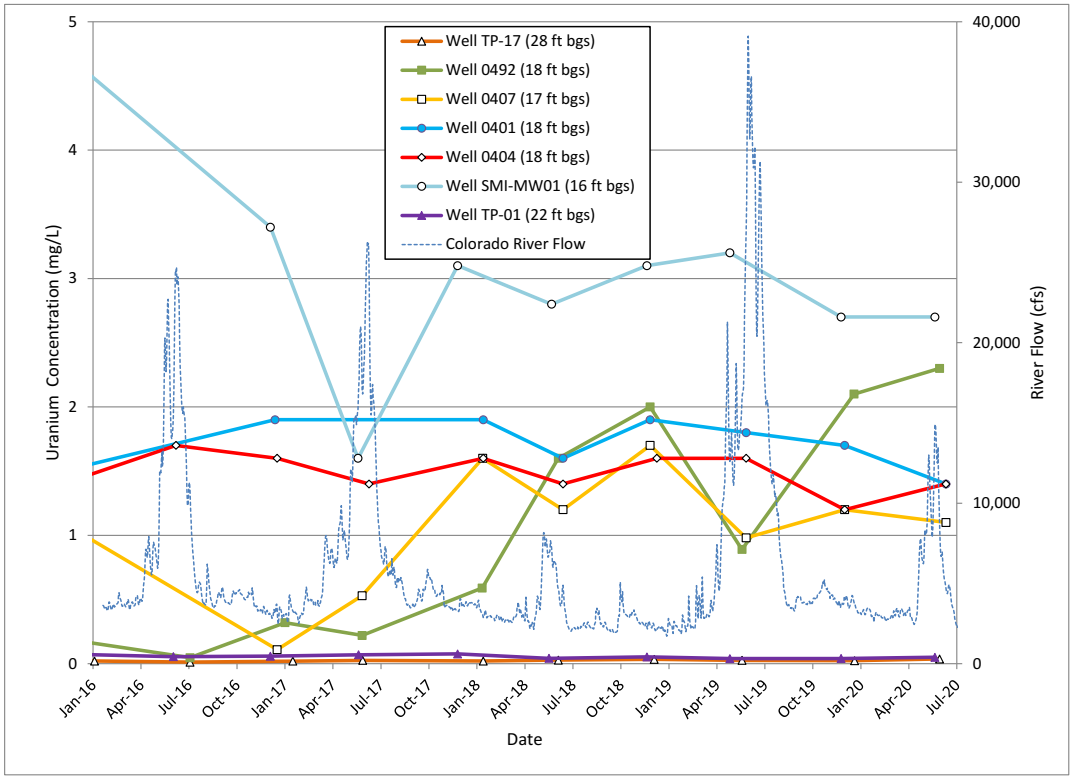

Figure 26. Riverbank Observation Wells TP-17, 0492, 0407, 0401, 0404, SMI-MW01, and TP-01 Time versus Uranium Concentration Plot

4.3.9 Southern and Off-site Areas

Figures 27 and 28 are the plots for four locations sampled at the southern end of the site, wells TP-17, TP-20, TP-23, and 0454. As discussed in Section 4.3.8, well TP-17 is located along the riverbank, TP-20 is located approximately 500 ft off the riverbank, and TP-23 and 0454 are located closer to the toe of the tailings pile. Sample depths range from 13 ft bgs (well 0454) to 32 ft bgs (TP-20).

Ammonia concentrations (Figure 27) in samples collected from wells TP-17 and TP-20 have consistently been below 5 mg/L since 2000, suggesting the ammonia plume has not significantly migrated past these locations during this time period. Groundwater flow is likely impeded by groundwater density differences related to the presence of the high density brine unit. During June 2020 specific conductance values were above 100,000 micro ohms per centimeter (µmhos/cm) at a depth of just 28 ft bgs and more than 136,000 µmhos/cm at a depth 32 ft bgs for wells TP-17 and -20 (respectively). These values suggest the brine unit is near the groundwater surface in this area of the site.

Ammonia concentrations in samples collected from well 0454 are impacted by flood events, as evidenced by the significant decrease observed in 2019. The specific conductance during this recent sampling event was more than 57,000 µmhos/cm at a depth of only 13 ft bgs, near the southwestern boundary of the groundwater system. Likewise, the sample from TP-23 was collected with a specific conductance of more than 29,000 µmhos/cm at a depth of 25 ft bgs. Well TP-23 is located 225 ft directly east of 0454, and the results from these samples provides insight into the ammonia concentration vertical differences in this portion of the ammonia plume.

Similar to the ammonia concentration results, concentrations measured from wells TP-17 and TP-20 (Figure 28) suggest no uranium plume migration in this area of the site, likely for the same reason (presence of brine in near the groundwater surface). The sample collected from well TP-17 continues to be below the 0.044 mg/L UMTRA standard (since 2008), while the concentrations in samples from location TP-20 have been at or below this standard since 1997. Uranium concentrations associated with samples from well 0454 have consistently been lower compared to those in samples from TP-23, and this trend continued during this most recent event. With the sample depth difference and the close proximity of these wells, the results suggest the uranium concentrations are higher at depth (at least down to 25 ft bgs).

4.3.10 SMI-PW01 Cluster

During this most recent sampling event, all four wells associated with the SMI-PW01 cluster were sampled, with samples collected from 18, 40, 57, and 73 ft bgs. This cluster is located approximately 250 ft from the river bank. Figures 29 and 30 are the plots displaying the ammonia and uranium concentrations measured at these various depths.

When analyzing well cluster data, it is important to note the depth of the brine interface. This interface was established to be equal to a TDS concentration of 35,000 mg/L, as documented in the 2002 *Characterization of Groundwater Brine Zones at the Moab Project Site (Phase 1)*. Vertical contaminant migration through the groundwater system is reduced due to density differences. Based on the results of this characterization sampling, a specific conductance of 59,000 µmhos/cm is equal to 35,000 mg/L TDS. Table 20 provides the sample depth, specific conductance, and both ammonia and uranium concentrations. Between 57 and 75 ft bgs the specific conductance increases from 43,000 to 105,000 µmhos/cm, indicating the brine interface was present between these depths during this sampling event.

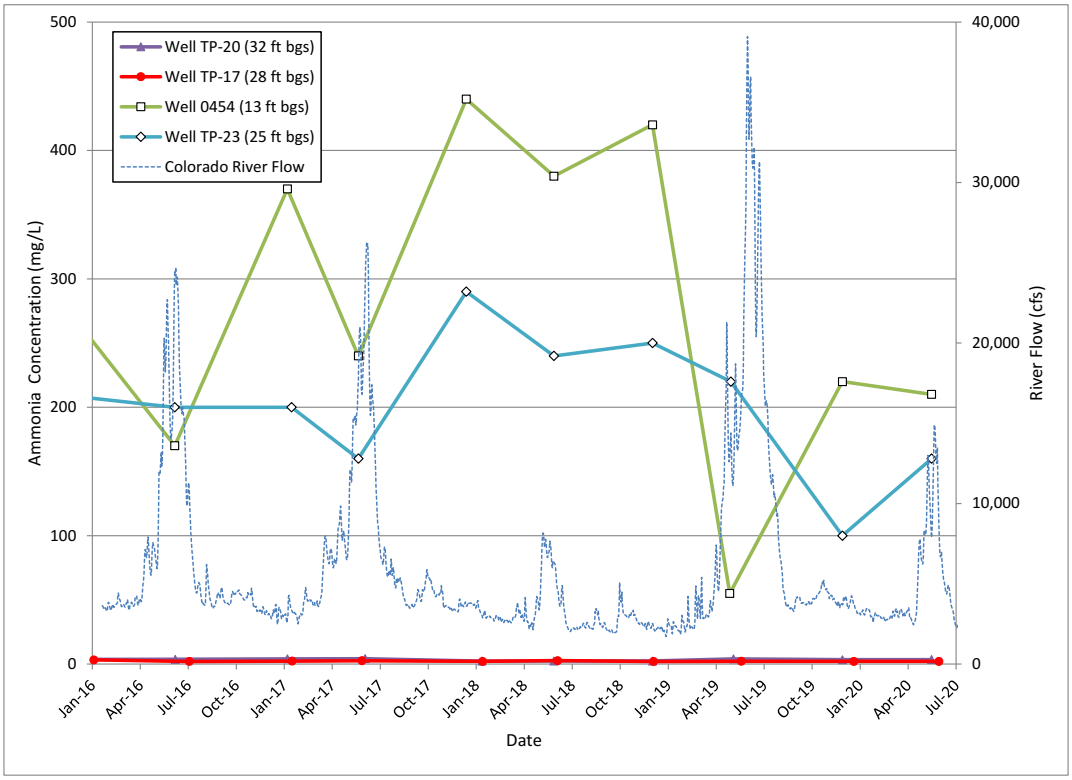

Figure 27. South of Site Observation Wells TP-17, TP-20, TP-23, and 0454 Time versus Ammonia Concentration Plot

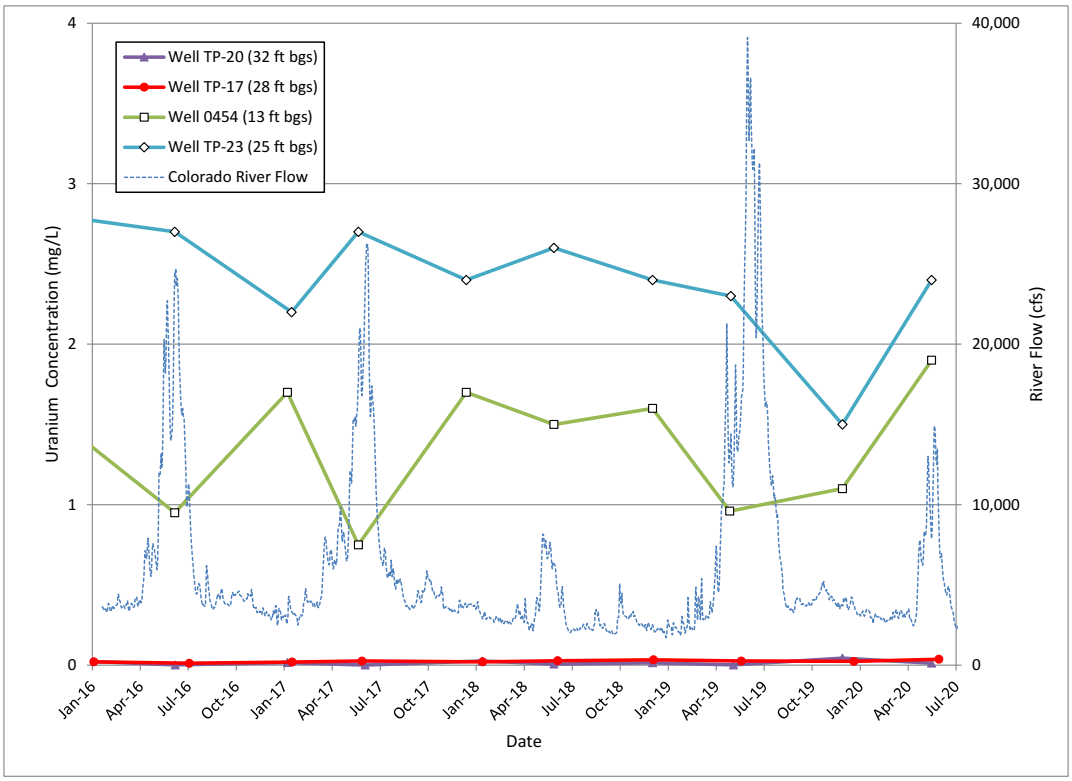

Figure 28. South of Site Observation Wells TP-17, TP-20, TP-23, and 0454 Time versus Uranium Concentration Plot

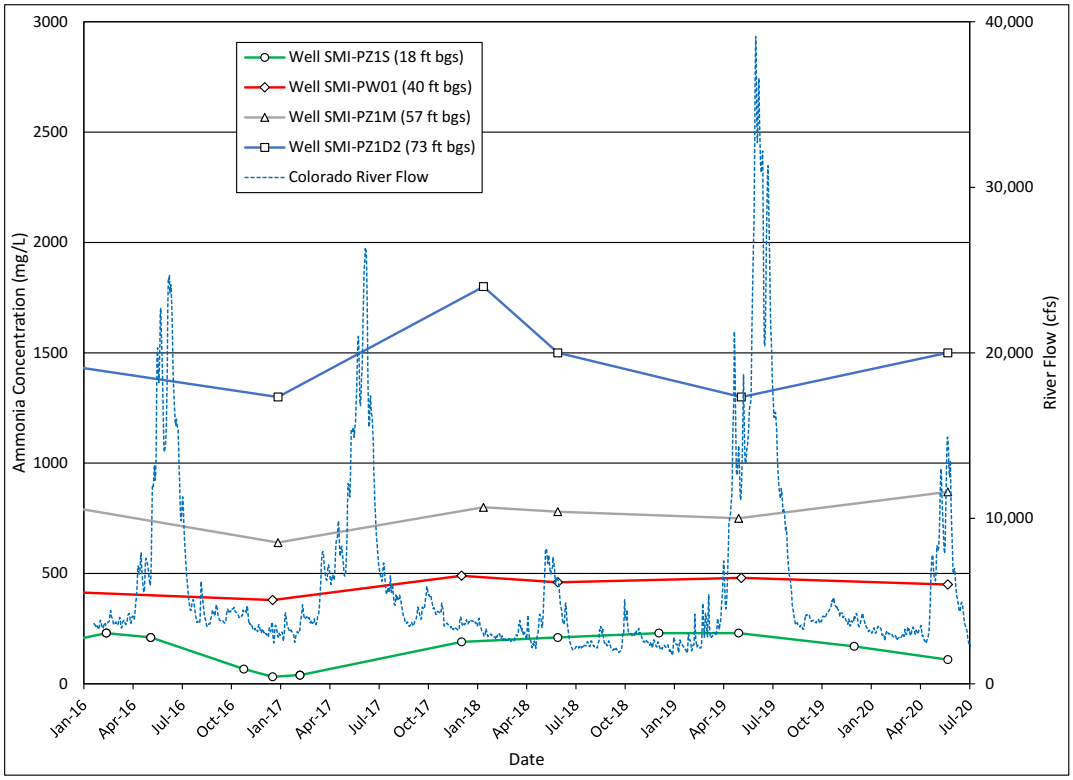

Figure 29. SMI-PW01 Well Cluster Time versus Ammonia Concentration Plot

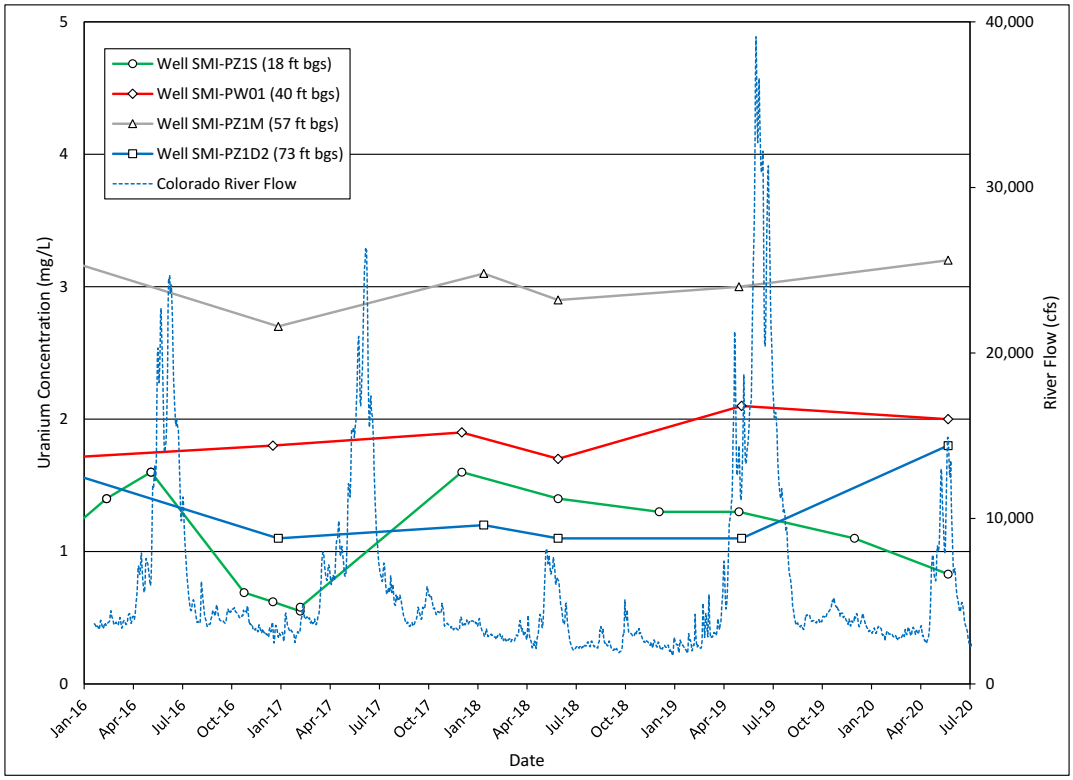

Figure 30. SMI-PW01 Well Cluster Time versus Uranium Concentration Plot

Table 20. June 2020 PW01 Cluster Sample Depths, Specific Conductance, Ammonia Concentrations, and Uranium Concentrations

Well	Sample Depth (ft bgs)	Specific Conductance (µmhos/cm)	Ammonia Concentration (mg/L)	Uranium Concentration (mg/L)
SMI-PZ1S	18	6,077	110	0.83
SMI-PW01	40	16,099	450	2.0
SMI-PZ1M	57	43,206	870	3.2
SMI-PZ1D2	73	105,090	1,500	1.8

As displayed in Figure 29, the sampling associated with this well cluster indicates that ammonia concentrations increase with depth, a trend that is consistent with sampling results associated with the groundwater brine characterization in 2002. During this most recent event, the ammonia concentrations ranged from 110 mg/L at a depth of 18 ft bgs to 1,500 mg/L at a depth of 73 ft bgs.

Uranium concentrations do not follow this same trend of increasing concentrations with depth, with highest concentrations associated with the samples collected from a depth of 57 ft bgs. Uranium appears to be less mobile compared to ammonia when coming in contact with the brine interface. This same vertical uranium profile is also consistent with the results of the 2002 characterization sampling. Uranium concentrations ranged from 0.83 to 3.2 mg/L in this area of the plume.

4.3.11 SMI-PW02 Cluster

The well PW-02 cluster consists of three wells. Well PW-02 is screened from 20 to 60 ft bgs, and is one of the groundwater extraction wells. The sample results represent groundwater collected from this entire screened interval, not a sample collected from a discrete depth. Samples were also collected from wells SMI-PZ2M2 and SMI-PZ2D at depths of 56 and 75 ft bgs, respectively. Figures 31 and 32 are the plots displaying the ammonia and uranium concentrations measured at these various depths.

Similar to the PW01 cluster, the depth of the brine interface in this area of the groundwater system plays a role in the vertical distribution of the contaminants. Table 21 provides the sample depth, specific conductance, and both ammonia and uranium concentrations for PW02 cluster sampling. Specific conductivity measurements during this sampling event indicate the brine interface is at a shallower depth compared to the PW01 cluster, above 56 ft bgs. The PW02 submersible pump intake is set at a depth of 55 ft bgs, and the specific conductance measurements indicate the pump is extracting groundwater from the entire screened interval.

Table 21. June 2020 PW02 Cluster Sample Depths, Specific Conductance, Ammonia Concentrations, and Uranium Concentrations

Well	Sample Depth (ft bgs)	Specific Conductance (µmhos/cm)	Ammonia Concentration (mg/L)	Uranium Concentration (mg/L)
SMI-PW02*	20 - 60	25,411	410	3.1
SMI-PZ2M2	56	81,896	500	2.0
SMI-PZ1D2	75	116,381	400	0.37

Notes: * = SMI-PW-02 is an extraction well, data from April 2020

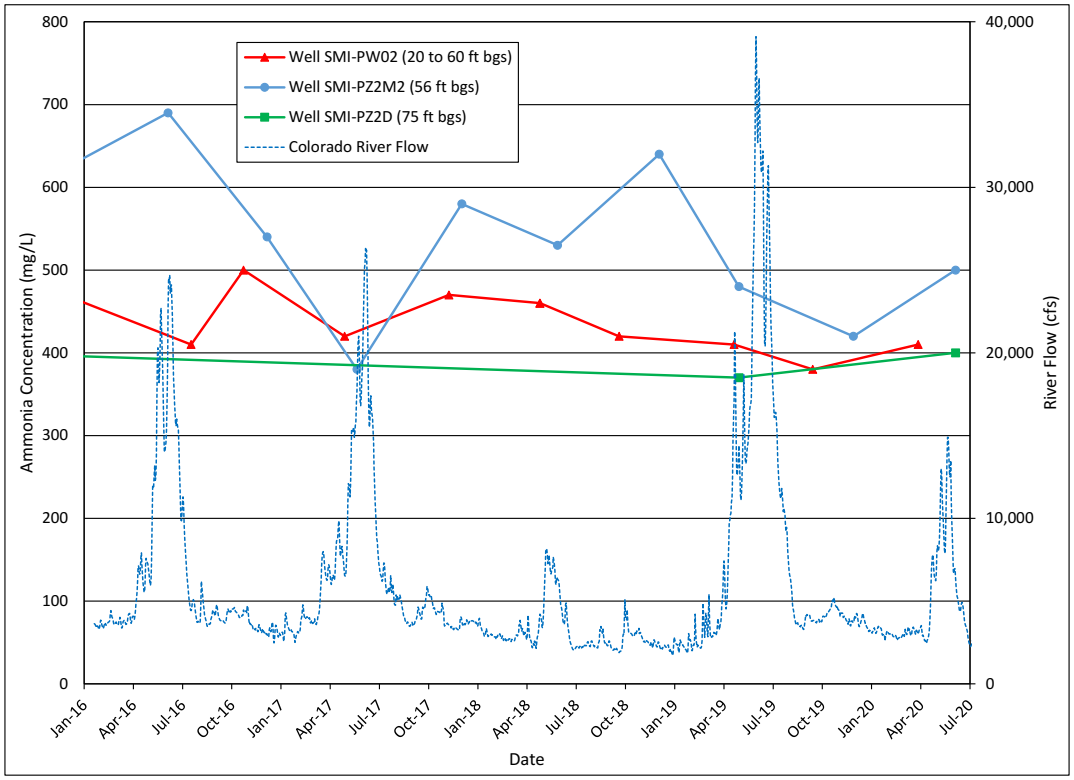

Figure 31. SMI-PW02 Well Cluster Time versus Ammonia Concentration Plot

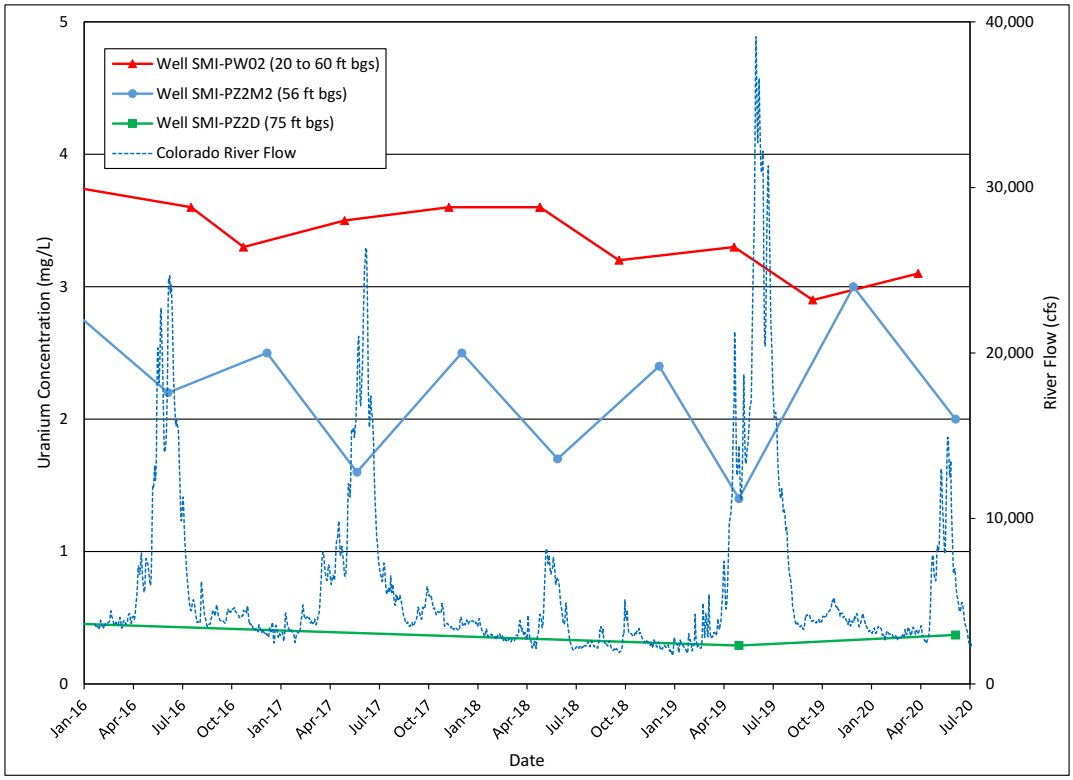

Figure 32. SMI-PW02 Well Cluster Time versus Uranium Concentration Plot

During the recent sampling event the ammonia concentrations (Figure 31) were highest in the sample collected from a depth of 56 ft bgs (the more shallow brine zone), which is consistent with the 2002 groundwater brine characterization results. Even though ammonia is more mobile than uranium, these results may indicate that ammonia has a limit of how far vertically it can migrate into the brine zone.

The uranium results are also consistent with the brine characterization study, where the sample having the lowest specific conductance is associated with the highest uranium concentration (Figure 32). Uranium concentrations in the shallow brine zone (56 ft bgs) are impacted by the river stage, as distinctly displayed by the decrease during higher river flows and corresponding increase during times when the river is experiencing base flows.

4.3.12 Response to CF5 Extraction

The sampling of wells AMM-2 and SMI-PZ2M2 provide some insight on how the CF5 extraction wells are impacting the groundwater system. Well AMM-2 is a monitoring well that is located approximately 100 ft off extraction well 0813, and well SMI-PZ2M2 is within the well PW02 cluster. These monitoring wells are screened 48 and 56 ft bgs (respectively), and have been sampled consistently over time.

Figure 33 presents the ammonia concentrations measured at these locations along with linear trend lines for each data set. Shown in this plot, the trend lines for both data sets are displaying a decreasing ammonia concentration since 2009. The trend line associated with well SMI-PZ2M2 exhibits a larger decrease in the concentrations (on average 50 mg/L/yr compared to the decrease of 11 mg/L/yr in AMM-2), possibly in response to the depth difference and well SMI-PZ2M2's close proximity to an extraction well.

Figure 34 is a similar plot for the uranium concentrations. Both trend lines show the uranium concentrations are increasing, which is consistent with the trend line data associated with the extraction well chemical data presented in Section 4.2. The trend line applied to the SMI-PZ2M2 data indicates that on average the uranium concentration increases 0.12 mg/L/yr, and the AMM-2 trend line suggests on average the uranium concentration increases 0.08 mg/L/yr.

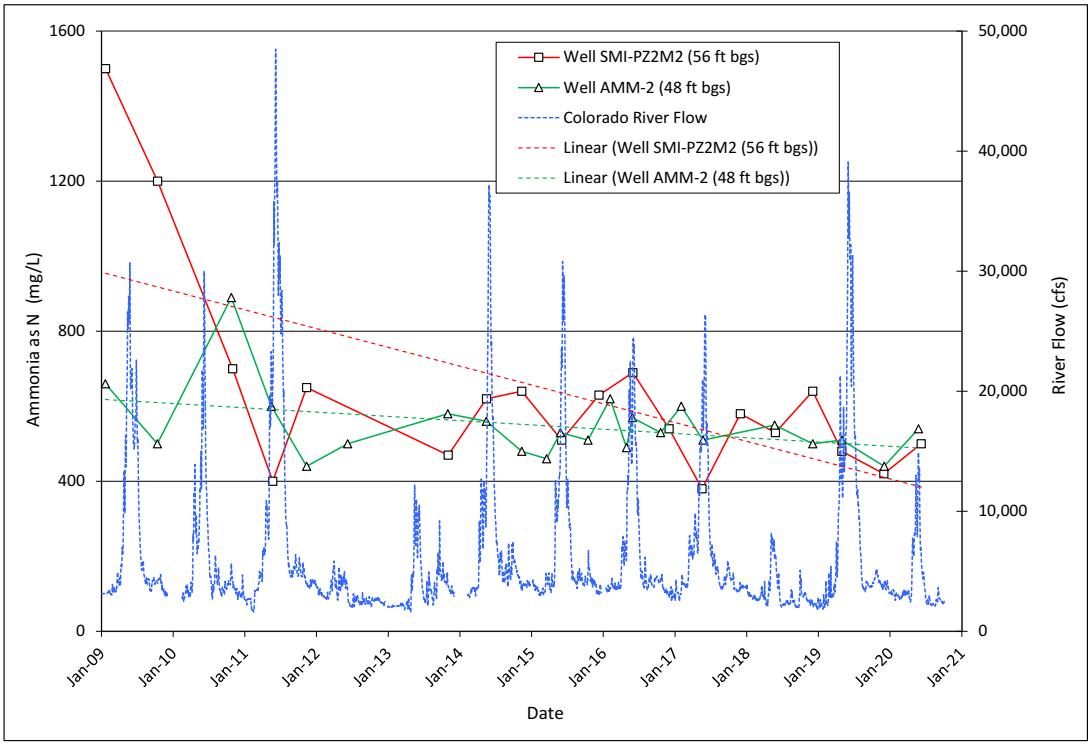

Figure 33. Monitoring Wells AMM-2 and SMI-PZ2M2 Time versus Ammonia Concentration Plot and Trend Lines

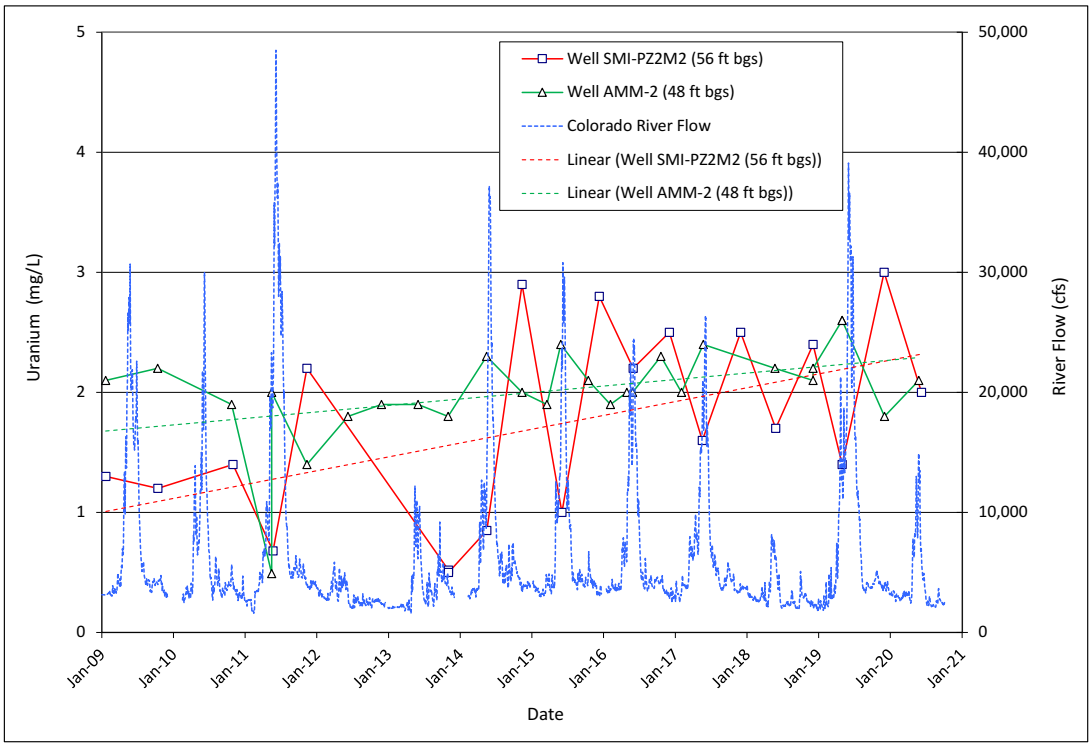

Figure 34. Monitoring Wells AMM-2 and SMI-PZ2M2 Time versus Uranium Concentration Plot and Trend Lines

4.3.13 Surface Water Sampling Results

Table 22 presents the ammonia results from the surface water sampling, with the samples collected in June 2020 from locations 0201, 0218, 0226, 0274, CR1, CR2, CR3, and CR5 (as shown in Figure 3). The ammonia concentrations and comparisons to the applicable EPA criteria for both acute and chronic concentrations (along with the temperature and pH data used to calculate these concentrations) are shown in Table 22.

Table 22. June 2020 Site-wide Surface Water Ammonia Concentrations and Comparisons to EPA Acute and Chronic Criteria

Location	Date	Temp (°C)	pH	June 2020 Ammonia as N (mg/L)	EPA - Acute Total as N (mg/L)*	EPA - Chronic Total as N (mg/L)**
0201	6/11/20	18.36	7.97	<0.2	8.8	0.88
0218	6/11/20	18.27	8.01	<0.2	8.8	0.88
0226	6/11/20	19.34	8.35	<0.2	4.1	0.52
0274	6/11/20	19.12	8.07	<0.2	7.3	0.71
CR1	6/11/20	17.46	7.72	<0.2	15	1.2
CR2	6/11/20	18.58	7.98	<0.2	8.8	0.83
CR3	6/11/20	19.70	8.13	<0.2	7.3	0.67
CR5	6/11/20	18.07	7.99	<0.2	8.8	0.88

Notes: *U.S. EPA Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater State (Effective April 2013), Table N.4. Temperature and pH-Dependent Values, Acute Concentration of Total Ammonia as N (mg/L)
**U.S. EPA Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater State (Effective April 2013), Table 6. Temperature and pH-Dependent Values, Chronic Concentration of Total Ammonia as N (mg/L)

The ammonia concentrations measured during this event were below the 0.2 mg/L detection limit. All surface water ammonia concentrations are below the applicable EPA criteria (for a suitable habitat) for both acute and chronic concentrations.

4.4 Groundwater Surface Elevations

Water level data to generate the groundwater surface contour map were collected between May 11 and 12, 2020, when the Colorado River mean daily flows ranged from 6,230 to 6,690 cfs, and the river stage at the southern end of the site only ranged from 3,955.0 to 3,955.2 feet above mean sea level. These flows were significantly below normal (the average mean daily flows for these dates ranged from 16,500 to 16,900 cfs) in response to a drought during the 2020 water year.

Because river elevations fluctuated only 0.2 ft during this time period, it was possible to use this water level data collected during this time frame to generate the groundwater surface contour map displayed in Figure 35. This contour map displays how the site groundwater system responds to the river during primarily losing conditions, when freshwater migrates into the groundwater system. Groundwater flow direction and the gradient displayed in this contour map are comparable to historical contour maps generated using groundwater data collected during river spring runoff conditions.

4.5 Contaminant Distribution

Figures 36 and 37 are maps showing shallow groundwater ammonia and uranium plumes, respectively, using data collected during the May/June 2019 site-wide events. Contaminant distribution is generally comparable to previous plume maps generated using data collected during the past two years.

A few areas along the bank were impacted by the river stage, and ammonia and uranium concentrations were lower. Ammonia concentrations appeared to be diluted in the vicinity of wells 0403 and 0407 as shown in Figure 36. Likewise, uranium concentrations were impacted in the vicinity of wells 0403 and SMI-PZ1S (Figure 37).

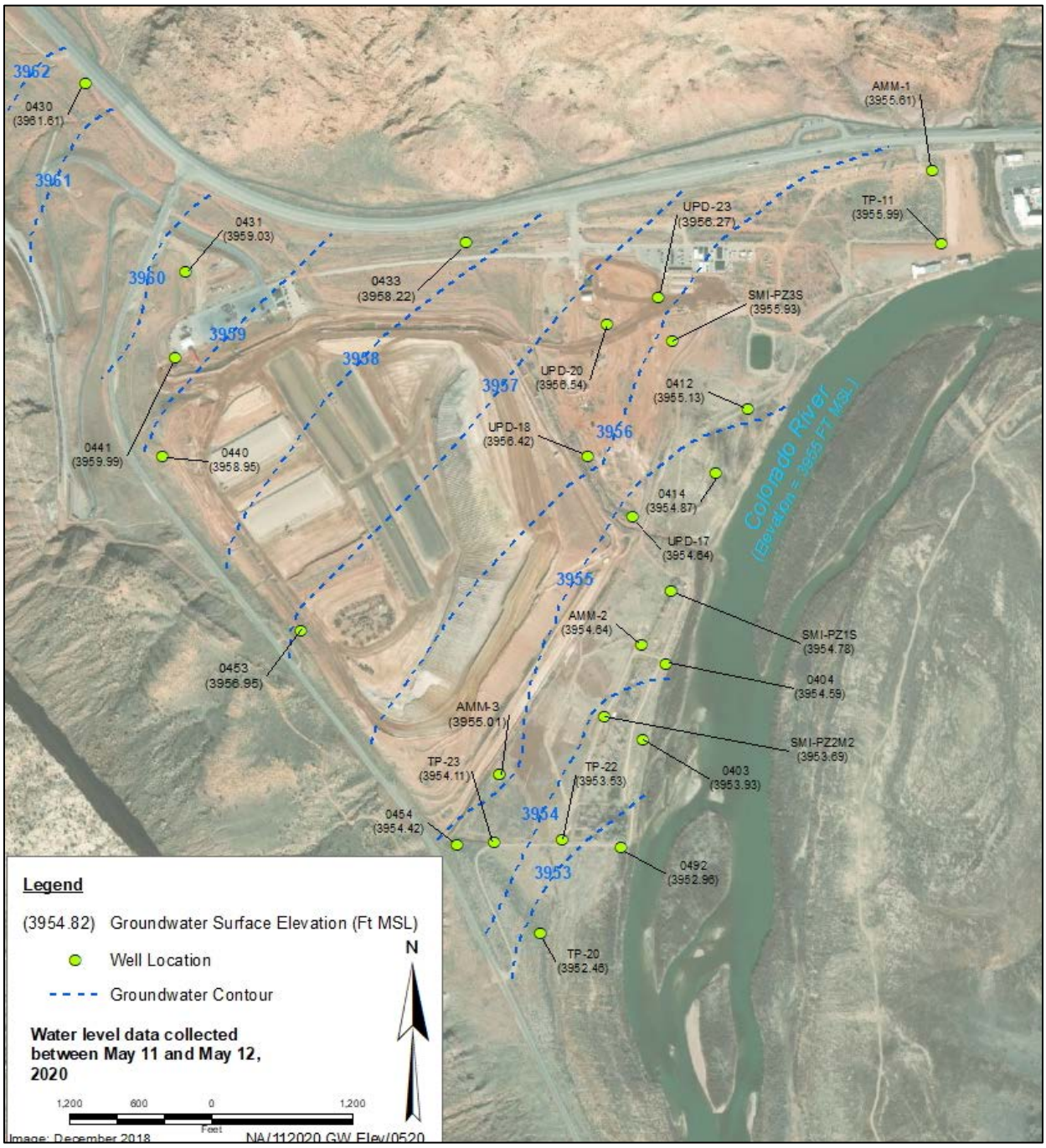

Figure 35. Site-wide Groundwater Elevations, May 11 and 12, 2020

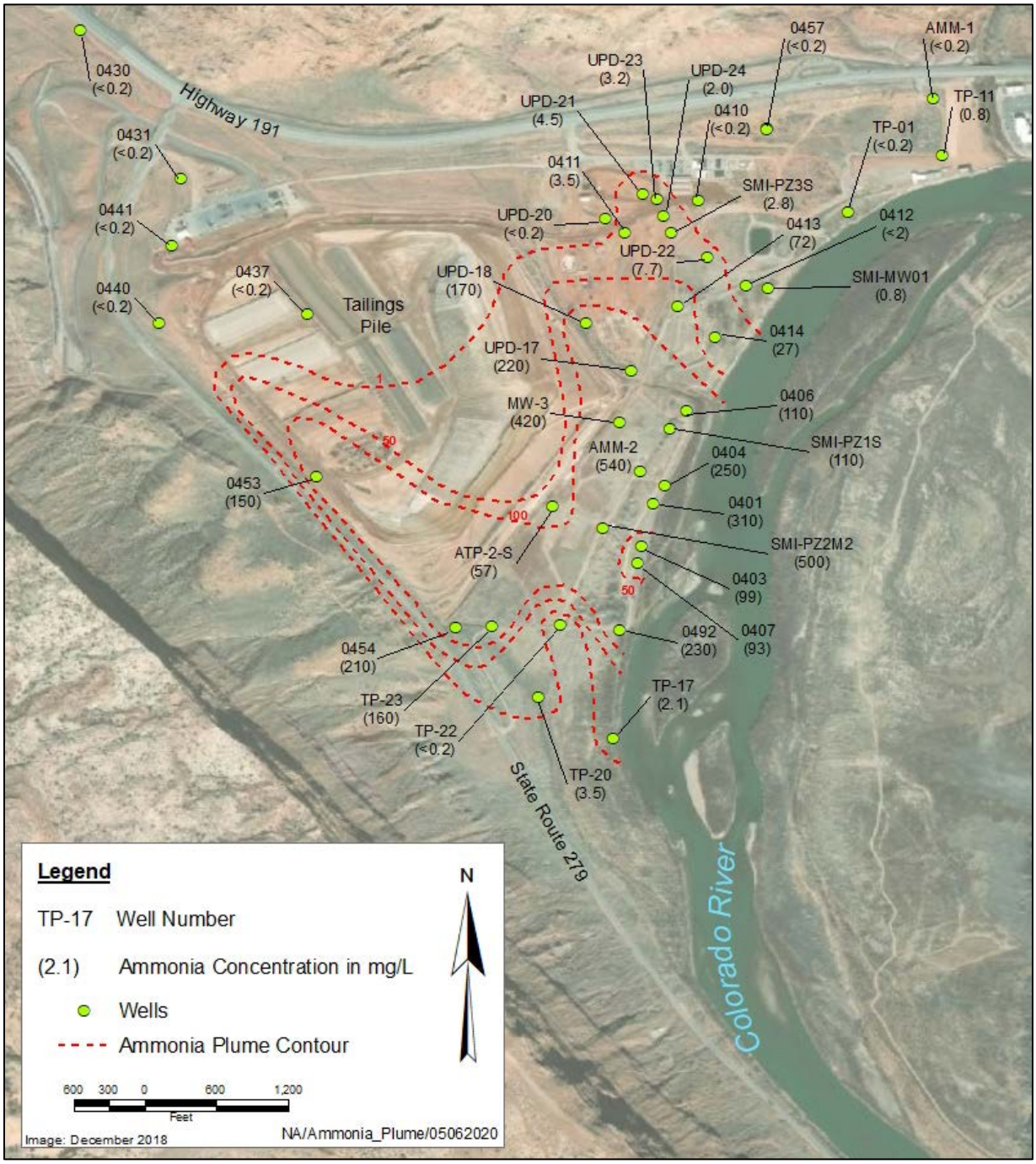

Figure 36. Ammonia Plume in Shallow Groundwater, May/June 2020

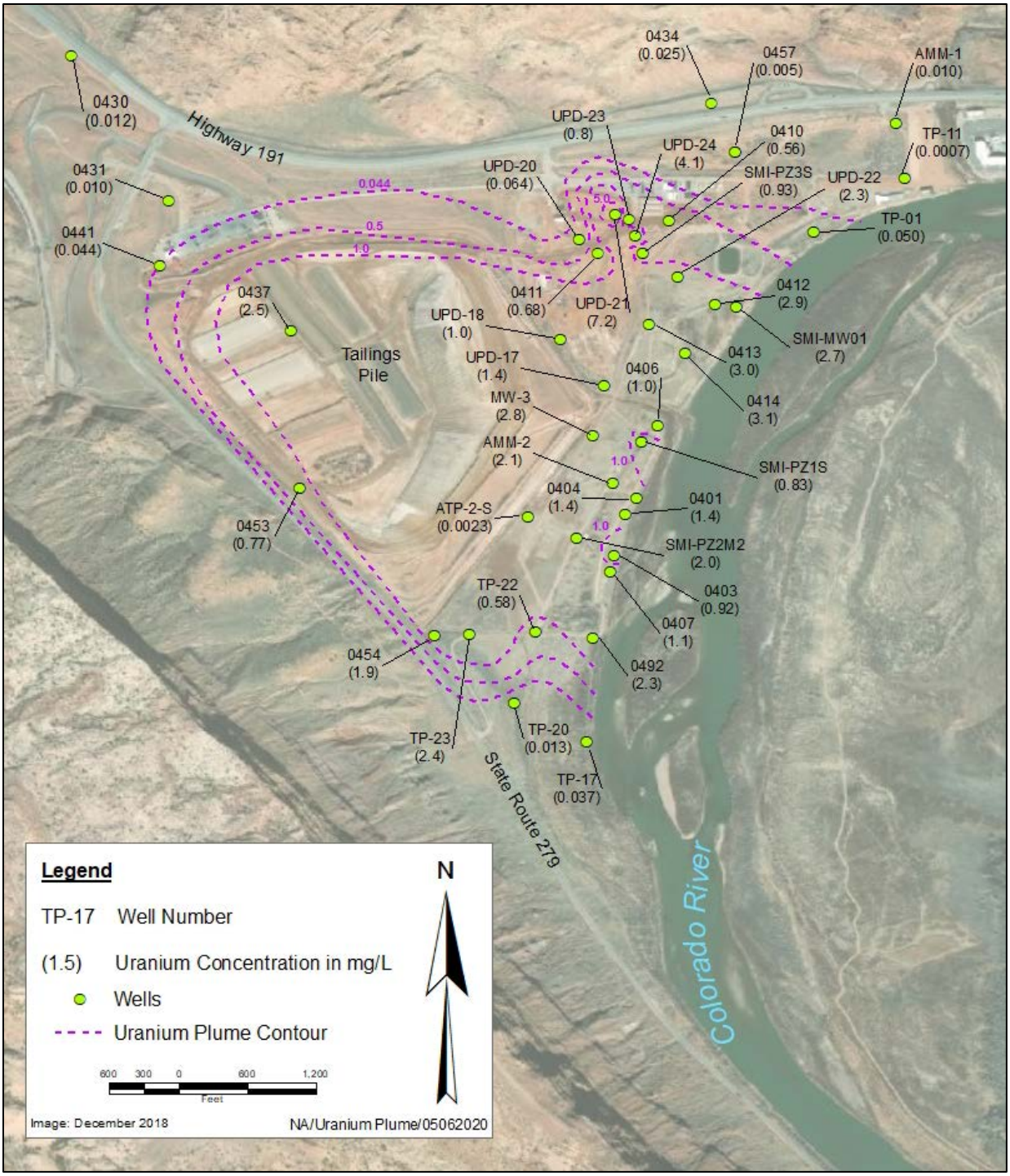

Figure 37. Uranium Plume in Shallow Groundwater, May/June 2020

5.0 Conclusions

This report presents the results of sampling conducted at the Moab and Crescent Junction sites between January and June 2020. The primary contaminants of interest are ammonia and uranium, and, while there is no EPA drinking water standard maximum concentration level for ammonia, the UMTRA groundwater standard for uranium is 0.044 mg/L. This uranium standard was exceeded in at least one location for each of the Moab site sampling events. Refer to Table 17 for a complete list of the Moab site locations and associated uranium concentrations that exceeded this 0.044 mg/L uranium standard. Select locations were also analyzed for arsenic and selenium, which have EPA Drinking Water Standards of 0.01 and 0.05 mg/L, respectively. Tables 18 and 19 provide the locations and associated concentrations that exceeded these standards.

There was one anomalous data point associated with these three sampling events, which was the result of the sample collected from well ATP-2-S during the site-wide event having a concentration significantly lower than the historic minimum.

5.1 February 2020 Crescent Junction Sampling Event

The rationale for collecting the groundwater sample from Crescent Junction monitoring well 0202 is to determine if the source of the water that recharges this location is the same as that which recharges well 0205. The sample collected from well 0205 was collected to determine if there were any changes to the source of the groundwater recharging this location. Both samples collected in February were part of the quarterly monitoring for the first quarter of 2020. In addition to the standard analytes, the samples were also analyzed for bicarbonate as $CaCO_3$, carbonate as $CaCO_3$, total alkalinity as $CaCO_3$, uranium-234, uranium-235, and uranium-238. The analyte concentrations in the samples collected from wells 0202 and 0205 are similar, suggesting both are recharged by precipitation events, and the water is not associated with Crescent Junction site activities.

5.2 April 2020 CF4/CF5 Sampling Event

The collection of groundwater samples from observation wells surrounding the CF4 injection wells in April 2020 was to evaluate the effectiveness of the injection system as it was actively injecting freshwater into the subsurface. The analytical results indicate a significant reduction in ammonia concentrations in the downgradient (east) direction, particularly in the zone above 28 ft bgs. This reduction in the ammonia concentrations played an important role in protecting any suitable habitat that may develop, especially during a drought year such as 2020. Water elevation data confirmed nearly 12 ft of mounding was generated from the operation of this system in early April 2020.

All eight CF5 wells were sampled to monitor contaminant concentration trends over time and update the contaminant concentrations used for the mass removal calculations. Statistical analysis of the data collected from the CF5 wells during the past 10 years indicates the ammonia concentrations on average have decreased 7 mg/L/yr, while during the same time period the uranium concentrations have on average increased 0.01 mg/L/yr. The data also indicate the samples collected from the extraction wells located along CF5 southeastern boundary continue to have higher ammonia concentrations compared to the samples collected from the wells near the base of the tailings pile. All CF5 wells have similar uranium concentrations, regardless of location.

5.3 May/June 2019 Site-wide Sampling Event

The rationale for conducting the May/June 2020 site-wide sampling event was to collect data from the site during Colorado River spring runoff flows and to assess any changes in the contaminant plume migration or trends in the groundwater system water chemistry. The river flows represented the early flows of what developed into a lower than average peak spring runoff river flow. Surface water sampling was also conducted to assess surface water quality adjacent to the site compared to upstream and downstream water quality.

In general, there was minimal plume migration based on the samples collected from wells located along the plume boundaries. Ammonia concentrations from the seven surface water samples collected during this sampling event were below the 0.2 mg/L ammonia laboratory detection limit and below the applicable EPA criteria (for a suitable habitat) for both acute and chronic concentrations.

6.0 References

40 CFR 192A (Code of Federal Regulations) Subpart A, "Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings, Standards for the Control of Residual Radioactive Materials from Inactive Uranium Processing Sites."

DOE (U.S. Department of Energy), *Characterization of Groundwater Brine Zones at the Moab Project Site (Phase 1)* (GJO-2002-333-TAR, GJO-MOA 19.1.2-3).

DOE (U.S. Department of Energy), *Moab UMTRA Project Standard Practice for Validation of Laboratory Data* (DOE-EM/GJTAC1855).

DOE (U.S. Department of Energy), *Moab UMTRA Project Surface Water/Groundwater Sampling and Analysis Plan* (DOE-EM/GJTAC1830).

Appendix A.
February 2020 Crescent Junction Sampling Event

Water Sampling Field Activities Verification
Minimums and Maximums Report
Water Quality Data
Water Level Data
Trip Report

Appendix A. February 2020 Crescent Junction Sampling Event

Water Sampling Field Activities Verification

Sampling Event/RIN	February 2020 CJ Sampling Event/RIN 2002119	**Date(s) of Water Sampling**	February 26, 2020
Date(s) of Verification	April 28, 2020	**Name of Verifier**	Ken Pill

	Response (Yes, No, NA)	Comments
1. Is the Sampling Analysis Plan (SAP) the primary document directing field procedures?	Yes	
2. List other documents, standard operating procedures, instructions.	NA	
3. Were the sampling locations specified in the planning documents sampled?	Yes	
4. Was a pre-trip calibration conducted as specified in the aforementioned documents?	Yes	
5. Was an operational check of the field equipment conducted in accordance with the SAP?	Yes	
6. Did the operational checks meet criteria?	Yes	
7. Were the number and types (alkalinity, temperature, electrical conductivity, pH, turbidity, oxidation reduction potential) of field measurements taken as specified?	Yes	Field measurements for temperature, pH, turbidity, oxidation reduction potential, and conductivity were collected.
8. Was the category of the well documented?	Yes	
9. Were the following conditions met when purging a Category I well:		
Was one pump/tubing volume purged before sampling?	NA	
Did the water level stabilize before sampling?	NA	
Did pH, specific conductance, and turbidity measurements stabilize before sampling?	NA	
Was the flow rate less than 500 milliliters per minute?	NA	
If a portable pump was used, was there a 4-hour delay between pump installation and sampling?	NA	
10. 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 before sampling?	Yes	
11. Were duplicates taken at a frequency of one per 20 samples?	NA	Only 2 samples were collected during this event.

Appendix A. February 2020 Crescent Junction Sampling Event (*continued*)

Water Sampling Field Activities Verification (*continued*)

Sampling Event/RIN	February 2020 CJ Sampling Event/RIN 2002119	**Date(s) of Water Sampling**	February 26, 2020
Date(s) of Verification	April 28, 2020	**Name of Verifier**	Ken Pill

	Response (Yes, No, NA)	Comments
12. Were EBs taken at a frequency of one per 20 samples that were collected with non-dedicated equipment?	NA	The samples were collected using the same bladder pump, and was thoroughly cleaned between locations.
13. Were trip blanks prepared and included with each shipment of volatile organic compound samples?	NA	
14. Were quality-control samples assigned a fictitious site identification number?	NA	
Was the true identity of the samples recorded on the quality assurance sample log?	NA	
15. Were samples collected in the containers specified?	Yes	
16. Were samples filtered and preserved as specified?	Yes	
17. Were the number and types of samples collected as specified?	NA	
18. Were COC records completed, and was sample custody maintained?	Yes	
19. Are field data sheets signed and dated by both team members?	Yes	
20. Was all other pertinent information documented on the field data sheets?	NA	
21. Was the presence or absence of ice in the cooler documented at every sample location?	Yes	
22. Were water levels measured at the locations specified in the planning documents?	Yes	

Appendix A. February 2020 Crescent Junction Sampling Event (*continued*)

Minimums and Maximums Report

Data Validation Minimums and Maximums Report - No Field Parameters
Laboratory: ALS
RIN: 2002119
Comparison: All Historical Data
Report Date: 10/27/2020 4:26 PM

				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
CRJ01	0205	02/26/2020	Sodium	8400			14000			8500			15	0
CRJ01	0205	02/26/2020	Total Dissolved Solids	21000			48000			24000	*		14	0

Note: All concentrations in mg/L

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

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

DATA QUALIFERS:
--F-Low flow sampling method used.
L-Less than 3 bore volumes purged prior to sampling.
R-Unusable result.
--G-Possible grout contamination, pH > 9.
N-Presumptive evidence that analyte is present. The analyte is "tentatively identified".
U-Parameter analyzed for but was not detected.
--J-Estimated value.
Q-Qualitative result due to sampling technique
X-Location is undefined.

Appendix A. February 2020 Crescent Junction Sampling Event (*continued*)

Water Quality Data

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE CRJ01, Crescent Junction Site

LOCATION: 0202 <well>

REPORT DATE: 11/19/2020 1:16 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/26/2020	0001	60.00	15		J	#	2	-
Arsenic	mg/L	02/26/2020	0001	60.00	0.039	U	J	#	0.039	-
BICARBONATE AS CaCO3	mg/L	02/26/2020	0001	60.00	1100		J	#	20	-
BORON	ug/L	02/26/2020	0001	60.00	1400		J	#	31	-
Bromide	mg/L	02/26/2020	0001	60.00	40	U	J	#	40	-
Cadmium	mg/L	02/26/2020	0001	60.00	0.0033	U	J	#	0.0033	-
Calcium	mg/L	02/26/2020	0001	60.00	390.000		J	#	0.12	-
CARBONATE AS CaCO3	mg/L	02/26/2020	0001	60.00	20	U	J	#	20	-
Chloride	mg/L	02/26/2020	0001	60.00	6000		J	#	100	-
Chromium	mg/L	02/26/2020	0001	60.00	0.0051	U	J	#	0.0051	-
Copper	mg/L	02/26/2020	0001	60.00	0.0097	U	J	#	0.0097	-
Fluoride	mg/L	02/26/2020	0001	60.00	20	U	J	#	20	-
Iron	mg/L	02/26/2020	0001	60.00	0.049	U	J	#	0.049	-
Lead	mg/L	02/26/2020	0001	60.00	0.013	U	J	#	0.013	-
Magnesium	mg/L	02/26/2020	0001	60.00	690.000		J	#	0.13	-
Manganese	mg/L	02/26/2020	0001	60.00	0.510		J	#	0.0011	-
MOLYBDENUM	ug/L	02/26/2020	0001	60.00	11	U	J	#	11	-
Nitrate + Nitrite as Nitrogen	mg/L	02/26/2020	0001	60.00	520	N	J	#	10	-

Appendix A. February 2020 Crescent Junction Sampling Event (*continued*)

Water Quality Data

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Oxidation Reduction Potential	mV	02/26/2020	N001	60.00	160			#	-	-
pH	s.u.	02/26/2020	N001	60.00	6.92			#	-	-
Potassium	mg/L	02/26/2020	0001	60.00	73.000		J	#	1.1	-
Selenium	mg/L	02/26/2020	0001	60.00	0.051	J	J	#	0.027	-
Sodium	mg/L	02/26/2020	0001	60.00	9400.000		J	#	0.66	-
Specific Conductance	umhos/cm	02/26/2020	N001	60.00	42101			#	-	-
Sulfate	mg/L	02/26/2020	0001	60.00	19000		J	#	200	-
Temperature	C	02/26/2020	N001	60.00	12.61			#	-	-
TOTAL ALKALINITY AS CaCO3	mg/L	02/26/2020	0001	60.00	1100		J	#	20	-
Total Dissolved Solids	mg/L	02/26/2020	0001	60.00	26000		J	#	1000	-
Turbidity	NTU	02/26/2020	N001	60.00	9.35			#	-	-
Uranium	mg/L	02/26/2020	0001	60.00	0.028		J	#	0.00012	-
Uranium-234	pCi/L	02/26/2020	0001	60.00	42.9	M3	J	#	0.2	±7.30
Uranium-235	pCi/L	02/26/2020	0001	60.00	1.17	M3	J	#	0.1	±0.46
Uranium-238	pCi/L	02/26/2020	0001	60.00	10.9	M3	J	#	0.2	±2.10

Appendix A. February 2020 Crescent Junction Sampling Event (*continued*)

Water Quality Data

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE CRJ01, Crescent Junction Site

LOCATION: 0205 <well>

REPORT DATE: 11/19/2020 1:16 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/26/2020	0001	68.00	12		J	#	2	-
Arsenic	mg/L	02/26/2020	0001	68.00	0.039	U	J	#	0.039	-
BICARBONATE AS CaCO3	mg/L	02/26/2020	0001	68.00	960		J	#	20	-
BORON	ug/L	02/26/2020	0001	68.00	1200		J	#	31	-
Bromide	mg/L	02/26/2020	0001	68.00	40	U	J	#	40	-
Cadmium	mg/L	02/26/2020	0001	68.00	0.0033	U	J	#	0.0033	-
Calcium	mg/L	02/26/2020	0001	68.00	290.000		J	#	0.12	-
CARBONATE AS CaCO3	mg/L	02/26/2020	0001	68.00	20	U	J	#	20	-
Chloride	mg/L	02/26/2020	0001	68.00	3000		J	#	40	-
Chromium	mg/L	02/26/2020	0001	68.00	0.0051	U	J	#	0.0051	-
Copper	mg/L	02/26/2020	0001	68.00	0.0097	U	J	#	0.0097	-
Fluoride	mg/L	02/26/2020	0001	68.00	20	U	J	#	20	-
Iron	mg/L	02/26/2020	0001	68.00	0.049	U	J	#	0.049	-
Lead	mg/L	02/26/2020	0001	68.00	0.013	U	J	#	0.013	-
Magnesium	mg/L	02/26/2020	0001	68.00	710.000		J	#	0.13	-
Manganese	mg/L	02/26/2020	0001	68.00	0.330		J	#	0.0011	-
MOLYBDENUM	ug/L	02/26/2020	0001	68.00	11	U	J	#	11	-
Nitrate + Nitrite as Nitrogen	mg/L	02/26/2020	0001	68.00	700		J	#	10	-

Appendix A. February 2020 Crescent Junction Sampling Event (*continued*)

Water Quality Data (*continued*)

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Oxidation Reduction Potential	mV	02/26/2020	N001	68.00	134			#	-	-
pH	s.u.	02/26/2020	N001	68.00	7.05			#	-	-
Potassium	mg/L	02/26/2020	0001	68.00	50.000		J	#	1.1	-
Selenium	mg/L	02/26/2020	0001	68.00	2.900		J	#	0.027	-
Sodium	mg/L	02/26/2020	0001	68.00	8400.000		J	#	0.66	-
Specific Conductance	umhos/cm	02/26/2020	N001	68.00	37684			#	-	-
Sulfate	mg/L	02/26/2020	0001	68.00	20000		J	#	200	-
Temperature	C	02/26/2020	N001	68.00	13.22			#	-	-
TOTAL ALKALINITY AS CaCO3	mg/L	02/26/2020	0001	68.00	960		J	#	20	-
Total Dissolved Solids	mg/L	02/26/2020	0001	68.00	21000		J	#	1000	-
Turbidity	NTU	02/26/2020	N001	68.00	43.90			#	-	-
Uranium	mg/L	02/26/2020	0001	68.00	0.027		J	#	0.00012	-
Uranium-234	pCi/L	02/26/2020	0001	68.00	27.9	M3	J	#	0.2	±4.90
Uranium-235	pCi/L	02/26/2020	0001	68.00	0.59	M3	J	#	0.21	±0.33
Uranium-238	pCi/L	02/26/2020	0001	68.00	9.5	M3	J	#	0.3	±1.90

Appendix A. February 2020 Crescent Junction Sampling Event (*continued*)

Water Quality Data (*continued*)

RECORDS: SELECTED FROM USEE105 WHERE RIN = '1907116' AND (DataValidationQualifiers IS NULL OR (DataValidationQualifiers NOT LIKE '%N%' AND DataValidationQualifiers NOT LIKE '%R%' AND DataValidationQualifiers NOT LIKE '%X%'))

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

LAB QUALIFERS:

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

DATA QUALIFERS:

F	Low flow sampling method used.	G	Possible grout contamination, pH > 9.	J	Estimated value.
L	Less than 3 bore volumes purged prior to sampling.	N	Presumptive evidence that analyte is present. The analyte is "tentatively identified".	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 A. February 2020 Crescent Junction Sampling Event (*continued*)

Water Level Data

STATIC WATER LEVELS (USEE700) FOR SITE CJ

REPORT DATE: 11/24/2020

Location Code	Flow Code	Ground Surface Elevation (Ft)	Measurement Date Time	Depth From Top of Casing (Ft)	Approximate Water Elevation (MSL)	Water Level Flag
0202	O	4960.0	02/262020	49.27	4910.7	
0205	O	4945.9	02/262020	46.90	4899.0	

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

Date: October 7, 2020
To: Ken Pill
From: James Ritchey
Subject: February 2020 CJ Sampling Event

Site: Crescent Junction – Wells 0202 and 0205
Date of Sampling Event: February 26, 2020
Team Members: N. Andrews, K. Pill, and J. Ritchey
RIN Number Assigned: All samples were assigned to RIN 2002119
Sample Shipment: The sample was shipped overnight UPS to ALS Environmental from Moab, Utah on February 26 of 2020 (Tracking number: 1Z5W1Y510192.91064).

Number of Locations Sampled: One sample was collected from each well 0202 and 0205 during the February 2020 CJ sampling event.

Locations Not Sampled/Reason: None.

Field Variance: None.

Quality Control Sample Cross Reference: None.

Location Specific Information: Well 0202 was sampled using a non-dedicated submersible pump with non-dedicated tubing. The table below provides additional information:

Location	Date	Sample Depth (ft btoc)	Depth to Water (ft btoc)	Comments
0202	02/26/2020	60	49.27	Yellowish water. DTW= 51.87 after sampling (10:55). DTW= 51.55 at 14:21.
0205	02/26/2020	68	46.90	Yellow water.

Notes: ft btoc = feet below top of casing.

Well Inspection Summary: A well inspection was not conducted.

Equipment: None.

Regulatory: None.

Site Issues: None.

Corrective Action Required/Taken: None.

Appendix B.
April 2020 CF4 and CF5 Sampling Event

Water Sampling Field Activities Verification
Water Quality Data
Water Level Data
Trip Report

Appendix B. April 2020 CF4 and CF5 Sampling Event
Water Sampling Field Activities Verification

Sampling Event/RIN	April 2020 CF4/CF5 Sampling Event /2004120	**Date(s) of Water Sampling**	April 7-8, 2020
Date(s) of Verification	April 28, 2020	**Name of Verifier**	Ken Pill

		Response (Yes, No, NA)	Comments
1.	Is the Sampling Analysis Plan (SAP) 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 in accordance with the SAP?	Yes	
	Did the operational checks meet criteria?	Yes	
5.	Were the number and types (alkalinity, temperature, electrical conductivity, pH, turbidity, oxidation reduction potential) of field measurements taken as specified?	Yes	Field measurements for temperature, pH, turbidity, oxidation reduction potential, and conductivity were collected.
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 before sampling?	Yes	
	Did the water level stabilize before sampling?	Yes	
	Did pH, specific conductance, and turbidity measurements stabilize before 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?	Yes	
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 before sampling?	Yes	
9.	Were duplicates taken at a frequency of one per 20 samples?	Yes	One duplicate sample was collected for 16 samples (location SMI-PW02)

Appendix B. April 2020 CF4 and CF5 Sampling Event Sampling Event (*continued*)

Water Sampling Field Activities Verification (*continued*)

Sampling Event/RIN	April 2020 CF4/CF5 Sampling Event /2004120	**Date(s) of Water Sampling**	April 7-8, 2020
Date(s) of Verification	April 28, 2020	**Name of Verifier**	Ken Pill

	Response (Yes, No, NA)	Comments
10. Were EBs taken at a frequency of one per 20 samples that were collected with non-dedicated equipment?	NA	All samples were collected using dedicated equipment.
11. Were trip blanks prepared and included with each shipment of volatile organic compound samples?	NA	
12. Were quality-control samples assigned a fictitious site identification number?	Yes	Duplicate for SMI-PW02 was given location 2000
13. Was the true identity of the samples recorded on the quality assurance sample log?	Yes	
14. Were samples collected in the containers specified?	Yes	
15. Were samples filtered and preserved as specified?	Yes	
16. Were the number and types of samples collected as specified?	Yes	
17. Were COC records completed, and was sample custody maintained?	Yes	
18. Are field data sheets signed and dated by both team members?	Yes	
19. Was all other pertinent information documented on the field data sheets?	Yes	
20. Was the presence or absence of ice in the cooler documented at every sample location?	Yes	
21. Were water levels measured at the locations specified in the planning documents?	Yes	

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0780 <well> Configuration 4

REPORT DATE: 11/19/2020 1:17 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/07/2020	0001	28.00	34		J	#	2	-
Oxidation Reduction Potential	mV	04/07/2020	N001	28.00	-55			#	-	-
pH	s.u.	04/07/2020	N001	28.00	8.01			#	-	-
Specific Conductance	umhos/cm	04/07/2020	N001	28.00	3679			#	-	-
Temperature	C	04/07/2020	N001	28.00	10.93			#	-	-
Turbidity	NTU	04/07/2020	N001	28.00	2.91			#	-	-
Uranium	mg/L	04/07/2020	0001	28.00	0.300		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0781 <well> Configuration 4

REPORT DATE: 11/19/2020 1:17 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/07/2020	0001	46.00	1600		J	#	100	-
Oxidation Reduction Potential	mV	04/07/2020	N001	46.00	56			#	-	-
pH	s.u.	04/07/2020	N001	46.00	6.91			#	-	-
Specific Conductance	umhos/cm	04/07/2020	N001	46.00	77821			#	-	-
Temperature	C	04/07/2020	N001	46.00	14.72			#	-	-
Turbidity	NTU	04/07/2020	N001	46.00	2.54			#	-	-
Uranium	mg/L	04/07/2020	0001	46.00	2.200		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0782 <well> Configuration 4

REPORT DATE: 11/19/2020 1:17 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/07/2020	0001	33.00	370		J	#	20	-
Oxidation Reduction Potential	mV	04/07/2020	N001	33.00	-14			#	-	-
pH	s.u.	04/07/2020	N001	33.00	7.50			#	-	-
Specific Conductance	umhos/cm	04/07/2020	N001	33.00	17997			#	-	-
Temperature	C	04/07/2020	N001	33.00	12.23			#	-	-
Turbidity	NTU	04/07/2020	N001	33.00	4.65			#	-	-
Uranium	mg/L	04/07/2020	0001	33.00	2.500		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0783 <well> Configuration 4

REPORT DATE: 11/19/2020 1:17 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/07/2020	0001	18.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	04/07/2020	N001	18.00	-70			#	-	-
pH	s.u.	04/07/2020	N001	18.00				#	-	-
Specific Conductance	umhos/cm	04/07/2020	N001	18.00	1198			#	-	-
Temperature	C	04/07/2020	N001	18.00	10.18			#	-	-
Turbidity	NTU	04/07/2020	N001	18.00	1.61			#	-	-
Uranium	mg/L	04/07/2020	0001	18.00	0.050		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0784 <well> Configuration 4

REPORT DATE: 11/19/2020 1:17 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/07/2020	0001	18.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	04/07/2020	N001	18.00	-83			#	-	-
pH	s.u.	04/07/2020	N001	18.00	8.43			#	-	-
Specific Conductance	umhos/cm	04/07/2020	N001	18.00	1191			#	-	-
Temperature	C	04/07/2020	N001	18.00	12.98			#	-	-
Turbidity	NTU	04/07/2020	N001	18.00	1.68			#	-	-
Uranium	mg/L	04/07/2020	0001	18.00	0.0088		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0785 <well> Configuration 4

REPORT DATE: 11/19/2020 1:17 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/07/2020	0001	18.00	0.2	UN	J	#	0.2	-
Oxidation Reduction Potential	mV	04/07/2020	N001	18.00	-19			#	-	-
pH	s.u.	04/07/2020	N001	18.00	7.79			#	-	-
Specific Conductance	umhos/cm	04/07/2020	N001	18.00	1218			#	-	-
Temperature	C	04/07/2020	N001	18.00	10.24			#	-	-
Turbidity	NTU	04/07/2020	N001	18.00	3.61			#	-	-
Uranium	mg/L	04/07/2020	0001	18.00	0.012		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0786 <well> Configuration 4

REPORT DATE: 11/19/2020 1:17 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/07/2020	0001	28.00	94		J	#	20	-
Oxidation Reduction Potential	mV	04/07/2020	N001	28.00	-61			#	-	-
pH	s.u.	04/07/2020	N001	28.00	8.17			#	-	-
Specific Conductance	umhos/cm	04/07/2020	N001	28.00	6412			#	-	-
Temperature	C	04/07/2020	N001	28.00	10.82			#	-	-
Turbidity	NTU	04/07/2020	N001	28.00	2.20			#	-	-
Uranium	mg/L	04/07/2020	0001	28.00	0.530		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0787 <well> Configuration 4

REPORT DATE: 11/19/2020 1:17 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/07/2020	0001	36.00	1800		J	#	100	-
Oxidation Reduction Potential	mV	04/07/2020	N001	36.00	70			#	-	-
pH	s.u.	04/07/2020	N001	36.00	7.28			#	-	-
Specific Conductance	umhos/cm	04/07/2020	N001	36.00	76321			#	-	-
Temperature	C	04/07/2020	N001	36.00	14.05			#	-	-
Turbidity	NTU	04/07/2020	N001	36.00	1.41			#	-	-
Uranium	mg/L	04/07/2020	0001	36.00	2.400		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0810 <well, extraction well> Configuration 5

REPORT DATE: 11/19/2020 1:17 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/08/2020	0001	10.4 – 40.4	310		J	#	20	-
Oxidation Reduction Potential	mV	04/08/2020	N001	10.4 – 40.4	24			#	-	-
pH	s.u.	04/08/2020	N001	10.4 – 40.4	6.81			#	-	-
Specific Conductance	umhos/cm	04/08/2020	N001	10.4 – 40.4	28179			#	-	-
Temperature	C	04/08/2020	N001	10.4 – 40.4	17.49			#	-	-
Turbidity	NTU	04/08/2020	N001	10.4 – 40.4	8.76			#	-	-
Uranium	mg/L	04/08/2020	0001	10.4 – 40.4	2.900		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0811 <well, extraction well> Configuration 5

REPORT DATE: 11/19/2020 1:17 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/08/2020	0001	8.6 – 38.6	370		J	#	20	-
Oxidation Reduction Potential	mV	04/08/2020	N001	8.6 – 38.6	13			#	-	-
pH	s.u.	04/08/2020	N001	8.6 – 38.6	7.11			#	-	-
Specific Conductance	umhos/cm	04/08/2020	N001	8.6 – 38.6	18716			#	-	-
Temperature	C	04/08/2020	N001	8.6 – 38.6	17.15			#	-	-
Turbidity	NTU	04/08/2020	N001	8.6 – 38.6	7.81			#	-	-
Uranium	mg/L	04/08/2020	0001	8.6 – 38.6	2.700		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0812 <well, extraction well> Configuration 5

REPORT DATE: 11/19/2020 1:17 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/08/2020	0001	14.2 – 44.2	420		J	#	20	-
Oxidation Reduction Potential	mV	04/08/2020	N001	14.2 – 44.2	17			#	-	-
pH	s.u.	04/08/2020	N001	14.2 – 44.2	7.00			#	-	-
Specific Conductance	umhos/cm	04/08/2020	N001	14.2 – 44.2	16332			#	-	-
Temperature	C	04/08/2020	N001	14.2 – 44.2	14.96			#	-	-
Turbidity	NTU	04/08/2020	N001	14.2 – 44.2	2.80			#	-	-
Uranium	mg/L	04/08/2020	0001	14.2 – 44.2	2.000		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0813 <well, extraction well> Configuration 5

REPORT DATE: 11/19/2020 1:17 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/08/2020	0001	14.4 – 44.4	220		J	#	20	-
Oxidation Reduction Potential	mV	04/08/2020	N001	14.4 – 44.4	6			#	-	-
pH	s.u.	04/08/2020	N001	14.4 – 44.4	6.95			#	-	-
Specific Conductance	umhos/cm	04/08/2020	N001	14.4 – 44.4	11256			#	-	-
Temperature	C	04/08/2020	N001	14.4 – 44.4	14.43			#	-	-
Turbidity	NTU	04/08/2020	N001	14.4 – 44.4	1.67			#	-	-
Uranium	mg/L	04/08/2020	0001	14.4 – 44.4	1.500		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0814 <well, extraction well> Configuration 5

REPORT DATE: 11/19/2020 1:17 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/08/2020	0001	12.4 – 42.4	160		J	#	20	-
Oxidation Reduction Potential	mV	04/08/2020	N001	12.4 – 42.4	14			#	-	-
pH	s.u.	04/08/2020	N001	12.4 – 42.4	7.16			#	-	-
Specific Conductance	umhos/cm	04/08/2020	N001	12.4 – 42.4	21122			#	-	-
Temperature	C	04/08/2020	N001	12.4 – 42.4	18.03			#	-	-
Turbidity	NTU	04/08/2020	N001	12.4 – 42.4	4.28			#	-	-
Uranium	mg/L	04/08/2020	0001	12.4 – 42.4	2.800		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0815 <well, extraction well> Configuration 5

REPORT DATE: 11/19/2020 1:17 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/08/2020	0001	21.7 – 51.7	150		J	#	20	-
Oxidation Reduction Potential	mV	04/08/2020	N001	21.7 – 51.7	16			#	-	-
pH	s.u.	04/08/2020	N001	21.7 – 51.7	7.19			#	-	-
Specific Conductance	umhos/cm	04/08/2020	N001	21.7 – 51.7	19569			#	-	-
Temperature	C	04/08/2020	N001	21.7 – 51.7	17.14			#	-	-
Turbidity	NTU	04/08/2020	N001	21.7 – 51.7	2.20			#	-	-
Uranium	mg/L	04/08/2020	0001	21.7 – 51.7	3.000		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0816 <well, extraction well> Configuration 5

REPORT DATE: 11/19/2020 1:17 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/08/2020	0001	20.9 – 50.9	120		J	#	20	-
Oxidation Reduction Potential	mV	04/08/2020	N001	20.9 – 50.9	7			#	-	-
pH	s.u.	04/08/2020	N001	20.9 – 50.9	7.08			#	-	-
Specific Conductance	umhos/cm	04/08/2020	N001	20.9 – 50.9	19723			#	-	-
Temperature	C	04/08/2020	N001	20.9 – 50.9	17.12			#	-	-
Turbidity	NTU	04/08/2020	N001	20.9 – 50.9	0.99			#	-	-
Uranium	mg/L	04/08/2020	0001	20.9 – 50.9	2.600		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: SMI-PW02 <well>

REPORT DATE: 11/19/2020 1:17 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/08/2020	0001	20.04 - 60.04	410		J	#	20	-
Ammonia Total as N	mg/L	04/08/2020	0002	20.04 - 60.04	390		J	#	20	-
Oxidation Reduction Potential	mV	04/08/2020	N001	20.04 - 60.04	12			#	-	-
pH	s.u.	04/08/2020	N001	20.04 - 60.04	6.92			#	-	-
Specific Conductance	umhos/cm	04/08/2020	N001	20.04 - 60.04	25411			#	-	-
Temperature	C	04/08/2020	N001	20.04 - 60.04	16.66			#	-	-
Turbidity	NTU	04/08/2020	N001	20.04 - 60.04	4.55			#	-	-
Uranium	mg/L	04/08/2020	0001	20.04 - 60.04	3.000		J	#	0.00012	-
Uranium	mg/L	04/08/2020	0002	20.04 - 60.04	3.100		J	#	0.0012	-

Appendix B. April 2020 CF4 and CF5 Sampling Event (*continued*)

Water Quality Data (*continued*)

RECORDS: SELECTED FROM USEE105 WHERE RIN = '1909117' AND (DataValidationQualifiers IS NULL OR (DataValidationQualifiers NOT LIKE '%N%' AND DataValidationQualifiers NOT LIKE '%R%' AND DataValidationQualifiers NOT LIKE '%X%'))

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

LAB QUALIFERS:

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

DATA QUALIFERS:

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

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

Appendix B. April 2020 CF4 and CF5 Sampling Event (*continued*)

Water Level Data

STATIC WATER LEVELS (USEE700) FOR SITE MOA01, Moab Site

REPORT DATE: 11/20/2020 8:20 AM

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
0780		3968.45	04/07/2020		15.50	3952.95	
0781		3968.56	04/07/2020		15.12	3953.44	
0782		3968.46	04/07/2020		15.49	3952.97	
0783		3966.16	04/07/2020		13.64	3952.52	
0784		3968.73	04/07/2020		16.18	3952.55	
0785		3969.24	04/07/2020		15.95	3953.29	
0786		3968.14	04/07/2020		15.28	3952.86	
0787		3968.43	04/07/2020		15.50	3952.93	

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

Trip Report

Date: October 7, 2020
To: Ken Pill
From: James Ritchey
Subject: April 2020 CF4 and CF5 Sampling Event

Site: Moab
Date of Sampling Event: April 7 – 8, 2020
Team Members: J. Ritchey N. Andrews
RIN Number Assigned: All samples were assigned to RIN 2004120.
Sample Shipment: One sample coolers was shipped overnight UPS to ALS Laboratory from Moab, Utah on April 9, of 2020 (Tracking number 1Z5W1Y510194037550).

April 2020 Configuration 4 Sampling

Number of Locations Sampled: Eight observation wells (0780, 0781, 0782, 0783, 0784, 0785, 0786, and 0787) were sampled during the April 2020 Sampling Event.

Locations Not Sampled: None.

Field Variance: None.

Quality Control Sample Cross Reference: None.

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

Well No.	Date	Time	Depth to Water (ft btoc)	Sample Depth (ft btoc)
0780	4/7/2020	11:45	15.50	28
0781	4/7/2020	12:00	15.12	46
0782	4/7/2020	12:15	15.49	32
0783	4/7/2020	14:30	13.64	18
0784	4/7/2020	14:10	16.18	18
0785	4/7/2020	13:50	15.95	18
0786	4/7/2020	13:35	15.28	28
0787	4/7/2020	12:30	15.50	36

April 2020 Configuration 5 Sampling

Number of Locations Sampled: Eight extraction wells (0810, 0811, 0812, 0813, 0814, 0815, 0816, and SMI-PW02) and one duplicate were sampled during the April 2020 Monthly Sampling Event.

Locations Not Sampled: None.

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	SMI-PW02	Duplicate from 55 ft bgs	Ground Water	APR 012

Location Specific Information – Extraction Wells: Extraction wells were sampled using dedicated submersible pumps. Samples were filtered and collected into open containers using dedicated flexible tubing. Sample depths and water levels for each extraction well are listed below.

Well No.	Date	Time	Pump Intake Depth (ft bgs)
0810	4/8/2020	10:45	10.4 – 40.4
0811	4/8/2020	10:53	8.6 – 38.6
0812	4/8/2020	11:35	14.2 – 44.2
0813	4/8/2020	11:45	14.4 – 44.4
0814	4/8/2020	12:25	12.4 – 42.4
0815	4/8/2020	12:00	21.7 – 51.7
0816	4/8/2020	11:50	20.9 – 50.9
SMI-PW02	4/8/2020	11:10	20.0 – 60.0

*Depths to water were not collected for wells.

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

Date	Daily Mean Flow (cfs)
4/7/2020	2,980
4/8/2020	3,040

Equipment Issues: None.

Corrective Action Required/Taken: None.

Appendix C.
May/June 2020 Site-wide Sampling Event

Water Sampling Field Activities Verification
Minimums and Maximums Report
Blanks Report
Water Quality Data
Water Level Data
Trip Report

Appendix C. May/June 2020 Site-wide Sampling Event
Water Sampling Field Activities Verification

Sampling Event/RIN	May/June 2020 Site-wide Sampling Event/2005121	**Date(s) of Water Sampling**	May 26 – June 25, 2020
Date(s) of Verification	September 13, 2020	**Name of Verifier**	Ken Pill

	Response (Yes, No, NA)	Comments
1. Is the Sampling Analysis Plan (SAP) 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 in accordance with the SAP?	Yes	
Did the operational checks meet criteria?	Yes	
5. Were the number and types (alkalinity, temperature, electrical conductivity, pH, turbidity, oxidation reduction potential) of field measurements taken as specified?	Yes	Field measurements for temperature, pH, turbidity, oxidation reduction potential, and conductivity were collected.
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 before sampling?	Yes	
Did the water level stabilize before sampling?	Yes	
Did pH, specific conductance, and turbidity measurements stabilize before sampling?	No	Wells AMM-1, SMI-PZ1M, and UPD-18 SC was within 10% for the last 2 readings, but not the last 3 readings prior to sampling
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?	Yes	
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 before sampling?	NA	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	Three duplicates were collected for 56 samples.

Appendix C. May/June 2020 Site-wide Sampling Event (*continued*)

Water Sampling Field Activities Verification (*continued*)

Sampling Event/RIN	May/June 2020 Site-wide Sampling Event/2005121	**Date(s) of Water Sampling**	May 26 – June 25, 2020
Date(s) of Verification	September 13, 2020	**Name of Verifier**	Ken Pill

	Response (Yes, No, NA)	Comments
10. Were EBs taken at a frequency of one per 20 samples that were collected with non-dedicated equipment?	Yes	One blank was collected for the 7 surface water samples, all other samples were collected using dedicated equipment. (location 2002)
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	Duplicate samples were collected from locations AMM-2 (2000), 0218 (2001), and 0407 (2003)
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	Water levels were measured between Oct 31 and Nov 6, plus just prior to sample collection

Appendix C. May/June 2020 Site-wide Sampling Event (*continued*)

Minimums and Maximums Report

Data Validation Minimums and Maximums Report - No Field Parameters
Laboratory: ALS
RIN: 2005121
Comparison: All Historical Data
Report Date: 10/27/2020 4:29 PM

				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	0413	05/26/2020	Selenium	0.045			0.3			0.047	J		11	0
MOA01	0414	06/03/2020	Selenium	0.045			0.205		F	0.072			9	0
MOA01	ATP-2-S	06/02/2020	Ammonia Total as N	57			1130			300		F	51	0
MOA01	ATP-2-S	06/02/2020	Selenium	0.0009	J		0.5	U		0.001	U		63	21
MOA01	TP-22	05/28/2020	Uranium	0.58			0.56			0.21			19	0

Note: All concentrations in mg/LSAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

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

LAB QUALIFIERS:

*	Replicate analysis not within control limits.
>	Result above upper detection limit.
A	TIC is a suspected aldol-condensation product.
B	Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
C	Pesticide result confirmed by GC-MS.
D	Analyte determined in diluted sample.
E	Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
H	Holding time expired, value suspect.
I	Increased detection limit due to required dilution.
J	Estimated
N	Inorganic or radiochemical: **Spike** sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
P	> 25% difference in detected pesticide or Aroclor concentrations between 2 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.
L	Less than 3 bore volumes purged prior to sampling.	J	Estimated value.
U	Parameter analyzed for but was not detected.	Q	Qualitative result due to sampling technique.
		R	Unusable result.
		X	Location is undefined.

Appendix C. May/June 2020 Site-wide Sampling Event (*continued*)

Blanks Report

Laboratory: ALS
RIN: 2005121
Report Date: 10/27/2020 4:29 PM

Parameter	Site Code	Location ID	Sample Date	Sample ID	Units	Result	Qualifiers Lab	Qualifiers Data	Detection Limit	Uncertainty	Sample Type
Ammonia Total as N	MOA01	2002	6/18/2020	0001	mg/L	0.2	U		0.2		E
Uranium	MOA01	2002	6/18/2020	0001	mg/L	0.0012	J		1.2E-05		E

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

LAB QUALIFIERS:

*	Replicate analysis not within control limits.
>	Result above upper detection limit.
A	TIC is a suspected aldol-condensation product.
B	Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
C	Pesticide result confirmed by GC-MS.
D	Analyte determined in diluted sample.
E	Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
H	Holding time expired, value suspect.
I	Increased detection limit due to required dilution.
J	Estimated
N	Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
P	> 25% difference in detected pesticide or Aroclor concentrations between 2 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 3 bore volumes purged prior to sampling.	Q	Qualitative result due to sampling technique.	R	Unusable result.
U	Parameter analyzed for but was not detected.	X	Location is undefined.		

SAMPLE TYPES:

E	Equipment Blank.

Appendix C. May/June 2020 Site-wide Sampling Event (*continued*)

Water Quality Data

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0201 <surface location, river>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/11/2020	0001	0.00 - 0.00	0.2	UN	J	#	0.2	-
Oxidation Reduction Potential	mV	06/11/2020	N001	0.00 - 0.00	22			#	-	-
pH	s.u.	06/11/2020	N001	0.00 - 0.00	7.97			#	-	-
Specific Conductance	umhos/cm	06/11/2020	N001	0.00 - 0.00	561			#	-	-
Temperature	C	06/11/2020	N001	0.00 - 0.00	18.36			#	-	-
Turbidity	NTU	06/11/2020	N001	0.00 - 0.00	159.00			#	-	-
Uranium	mg/L	06/11/2020	0001	0.00 - 0.00	0.0021		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0218 <surface location, river>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/11/2020	0001	0.00 - 0.00	0.2	U	J	#	0.2	-
Ammonia Total as N	mg/L	06/11/2020	0002	0.00 - 0.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	06/11/2020	N001	0.00 - 0.00	19			#	-	-
pH	s.u.	06/11/2020	N001	0.00 - 0.00	8.01			#	-	-
Specific Conductance	umhos/cm	06/11/2020	N001	0.00 - 0.00	568			#	-	-
Temperature	C	06/11/2020	N001	0.00 - 0.00	18.27			#	-	-
Turbidity	NTU	06/11/2020	N001	0.00 - 0.00	68.90			#	-	-
Uranium	mg/L	06/11/2020	0001	0.00 - 0.00	0.0021		J	#	1.2E-05	-
Uranium	mg/L	06/11/2020	0002	0.00 - 0.00	0.0022		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0226 <surface location, river>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/11/2020	0001	0.00 - 0.00	0.2	UN	J	#	0.2	-
Oxidation Reduction Potential	mV	06/11/2020	N001	0.00 - 0.00	-25			#	-	-
pH	s.u.	06/11/2020	N001	0.00 - 0.00	8.35			#	-	-
Specific Conductance	umhos/cm	06/11/2020	N001	0.00 - 0.00	571			#	-	-
Temperature	C	06/11/2020	N001	0.00 - 0.00	19.34			#	-	-
Turbidity	NTU	06/11/2020	N001	0.00 - 0.00	243.00			#	-	-
Uranium	mg/L	06/11/2020	0001	0.00 - 0.00	0.0021		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0274 <surface location, river> Configuration 4

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/11/2020	0001	0.00 - 0.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	06/11/2020	N001	0.00 - 0.00	27			#	-	-
pH	s.u.	06/11/2020	N001	0.00 - 0.00	8.07			#	-	-
Specific Conductance	umhos/cm	06/11/2020	N001	0.00 - 0.00	568			#	-	-
Temperature	C	06/11/2020	N001	0.00 - 0.00	19.12			#	-	-
Turbidity	NTU	06/11/2020	N001	0.00 - 0.00	177.00			#	-	-
Uranium	mg/L	06/11/2020	0001	0.00 - 0.00	0.0023		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0401 <well> Configuration 2

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/23/2020	0001	18.00	310		J	#	20	-
Oxidation Reduction Potential	mV	06/23/2020	N001	18.00	78			#	-	-
pH	s.u.	06/23/2020	N001	18.00	6.71			#	-	-
Specific Conductance	umhos/cm	06/23/2020	N001	18.00	14119			#	-	-
Temperature	C	06/23/2020	N001	18.00	17.57			#	-	-
Turbidity	NTU	06/23/2020	N001	18.00	1.34			#	-	-
Uranium	mg/L	06/23/2020	0001	18.00	1.400		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0403 <well> Configuration 1

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/23/2020	0001	18.00	99		J	#	20	-
Oxidation Reduction Potential	mV	06/23/2020	N001	18.00	56			#	-	-
pH	s.u.	06/23/2020	N001	18.00	6.93			#	-	-
Specific Conductance	umhos/cm	06/23/2020	N001	18.00	7877			#	-	-
Temperature	C	06/23/2020	N001	18.00	17.64			#	-	-
Turbidity	NTU	06/23/2020	N001	18.00	0.65			#	-	-
Uranium	mg/L	06/23/2020	0001	18.00	0.920		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0404 <well> CF3

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/23/2020	0001	18.00	250		J	#	20	-
Oxidation Reduction Potential	mV	06/23/2020	N001	18.00	90			#	-	-
pH	s.u.	06/23/2020	N001	18.00	6.73			#	-	-
Specific Conductance	umhos/cm	06/23/2020	N001	18.00	12280			#	-	-
Temperature	C	06/23/2020	N001	18.00	17.11			#	-	-
Turbidity	NTU	06/23/2020	N001	18.00	1.15			#	-	-
Uranium	mg/L	06/23/2020	0001	18.00	1.400		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0406 <well> Baseline Area

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/23/2020	0001	18.00	110		J	#	20	-
Oxidation Reduction Potential	mV	06/23/2020	N001	18.00	69			#	-	-
pH	s.u.	06/23/2020	N001	18.00	7.04			#	-	-
Specific Conductance	umhos/cm	06/23/2020	N001	18.00	7844			#	-	-
Temperature	C	06/23/2020	N001	18.00	16.09			#	-	-
Turbidity	NTU	06/23/2020	N001	18.00	7.25			#	-	-
Uranium	mg/L	06/23/2020	0001	18.00	1.000		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0407 <well> CF1

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/23/2020	0001	17.00	93		J	#	20	-
Ammonia Total as N	mg/L	06/23/2020	0002	17.00	79		J	#	20	-
Oxidation Reduction Potential	mV	06/23/2020	N001	17.00	47			#	-	-
pH	s.u.	06/23/2020	N001	17.00	6.94			#	-	-
Specific Conductance	umhos/cm	06/23/2020	N001	17.00	8714			#	-	-
Temperature	C	06/23/2020	N001	17.00	17.96			#	-	-
Turbidity	NTU	06/23/2020	N001	17.00	0.78			#	-	-
Uranium	mg/L	06/23/2020	0001	17.00	1.100		J	#	1.2E-05	-
Uranium	mg/L	06/23/2020	0002	17.00	1.100		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0410 <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/08/2020	0001	23.50	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	06/08/2020	N001	23.50	94			#	-	-
pH	s.u.	06/08/2020	N001	23.50	6.82			#	-	-
Specific Conductance	umhos/cm	06/08/2020	N001	23.50	3446			#	-	-
Temperature	C	06/08/2020	N001	23.50	17.95			#	-	-
Turbidity	NTU	06/08/2020	N001	23.50	1.27			#	-	-
Uranium	mg/L	06/08/2020	0001	23.50	0.560		J	#	1.2E-05	-

Appendix C. May/June 2020 Site-wide Sampling Event (*continued*)
Water Quality Data (*continued*)

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0411 <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/08/2020	0001	8.00	3.5		J	#	0.2	-
Oxidation Reduction Potential	mV	06/08/2020	N001	8.00	93			#	-	-
pH	s.u.	06/08/2020	N001	8.00	7.13			#	-	-
Selenium	mg/L	06/08/2020	0001	8.00	0.120		J	#	0.00066	-
Specific Conductance	umhos/cm	06/08/2020	N001	8.00	7324			#	-	-
Temperature	C	06/08/2020	N001	8.00	18.82			#	-	-
Turbidity	NTU	06/08/2020	N001	8.00				#	-	-
Uranium	mg/L	06/08/2020	0001	8.00	0.680		J	#	1.2E-05	-

Appendix C. May/June 2020 Site-wide Sampling Event (*continued*)
Water Quality Data (*continued*)

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0412 <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/02/2020	0001	9.50	2	U	J	#	2	-
Arsenic	mg/L	06/02/2020	0001	9.50	0.025		J	#	0.00012	-
Oxidation Reduction Potential	mV	06/02/2020	N001	9.50	-14			#	-	-
pH	s.u.	06/02/2020	N001	9.50	7.61			#	-	-
Selenium	mg/L	06/02/2020	0001	9.50	0.012		J	#	0.00066	-
Specific Conductance	umhos/cm	06/02/2020	N001	9.50	1420			#	-	-
Temperature	C	06/02/2020	N001	9.50	18.77			#	-	-
Turbidity	NTU	06/02/2020	N001	9.50	6.34			#	-	-
Uranium	mg/L	06/02/2020	0001	9.50	2.900		J	#	0.00012	-

Appendix C. May/June 2020 Site-wide Sampling Event (*continued*)
Water Quality Data (*continued*)

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0413 <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/26/2020	0001	10.50	72		J	#	20	-
Oxidation Reduction Potential	mV	05/26/2020	N001	10.50	24			#	-	-
pH	s.u.	05/26/2020	N001	10.50	7.73			#	-	-
Selenium	mg/L	05/26/2020	0001	10.50	0.045		J	#	0.00066	-
Specific Conductance	umhos/cm	05/26/2020	N001	10.50	7458			#	-	-
Temperature	C	05/26/2020	N001	10.50	16.07			#	-	-
Turbidity	NTU	05/26/2020	N001	10.50	8.93			#	-	-
Uranium	mg/L	05/26/2020	0001	10.50	3.000		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0414 <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/03/2020	0001	7.50	27		J	#	2	-
Arsenic	mg/L	06/03/2020	0001	7.50	0.017		J	#	0.00012	-
Oxidation Reduction Potential	mV	06/03/2020	N001	7.50	5			#	-	-
pH	s.u.	06/03/2020	N001	7.50	7.24			#	-	-
Selenium	mg/L	06/03/2020	0001	7.50	0.045		J	#	0.00066	-
Specific Conductance	umhos/cm	06/03/2020	N001	7.50	9053			#	-	-
Temperature	C	06/03/2020	N001	7.50	14.43			#	-	-
Turbidity	NTU	06/03/2020	N001	7.50	7.88			#	-	-
Uranium	mg/L	06/03/2020	0001	7.50	3.100		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0430 <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/22/2020	0001	101.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	06/22/2020	N001	101.00	39			#	-	-
pH	s.u.	06/22/2020	N001	101.00	7.12			#	-	-
Specific Conductance	umhos/cm	06/22/2020	N001	101.00	6382			#	-	-
Temperature	C	06/22/2020	N001	101.00	20.10			#	-	-
Turbidity	NTU	06/22/2020	N001	101.00	2.24			#	-	-
Uranium	mg/L	06/22/2020	0001	101.00	0.012		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0431 <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/24/2020	0001	91.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	06/24/2020	N001	91.00	35			#	-	-
pH	s.u.	06/24/2020	N001	91.00	7.28			#	-	-
Specific Conductance	umhos/cm	06/24/2020	N001	91.00	36442			#	-	-
Temperature	C	06/24/2020	N001	91.00	19.92			#	-	-
Turbidity	NTU	06/24/2020	N001	91.00	0.68			#	-	-
Uranium	mg/L	06/24/2020	0001	91.00	0.010		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0434 <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/25/2020	0001	35.00	0.22		J	#	0.2	-
Oxidation Reduction Potential	mV	06/25/2020	N001	35.00	-93			#	-	-
pH	s.u.	06/25/2020	N001	35.00	7.90			#	-	-
Specific Conductance	umhos/cm	06/25/2020	N001	35.00	48173			#	-	-
Temperature	C	06/25/2020	N001	35.00	20.32			#	-	-
Turbidity	NTU	06/25/2020	N001	35.00	3.98			#	-	-
Uranium	mg/L	06/25/2020	0001	35.00	0.025		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0435 <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/18/2020	0001	173.00	1.6		J	#	0.2	-
Oxidation Reduction Potential	mV	06/18/2020	N001	173.00	-192			#	-	-
pH	s.u.	06/18/2020	N001	173.00	8.07			#	-	-
Specific Conductance	umhos/cm	06/18/2020	N001	173.00	119718			#	-	-
Temperature	C	06/18/2020	N001	173.00	18.38			#	-	-
Turbidity	NTU	06/18/2020	N001	173.00	3.37			#	-	-
Uranium	mg/L	06/18/2020	0001	173.00	0.030		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0437 <well> CA

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/17/2020	0001	97.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	06/17/2020	N001	97.00	42			#	-	-
pH	s.u.	06/17/2020	N001	97.00	7.30			#	-	-
Selenium	mg/L	06/17/2020	0001	97.00	0.097		J	#	0.00066	-
Specific Conductance	umhos/cm	06/17/2020	N001	97.00	11190			#	-	-
Temperature	C	06/17/2020	N001	97.00	18.46			#	-	-
Turbidity	NTU	06/17/2020	N001	97.00	2.87			#	-	-
Uranium	mg/L	06/17/2020	0001	97.00	2.500		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0440 <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/10/2020	0001	117.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	06/10/2020	N001	117.00	73			#	-	-
pH	s.u.	06/10/2020	N001	117.00	6.63			#	-	-
Selenium	mg/L	06/10/2020	0001	117.00	0.061		J	#	0.00066	-
Specific Conductance	umhos/cm	06/10/2020	N001	117.00	8829			#	-	-
Temperature	C	06/10/2020	N001	117.00	20.76			#	-	-
Turbidity	NTU	06/10/2020	N001	117.00	9.47			#	-	-
Uranium	mg/L	06/10/2020	0001	117.00	0.035		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0441 <well> Support Area

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/22/2020	0001	53.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	06/22/2020	N001	53.00	24			#	-	-
pH	s.u.	06/22/2020	N001	53.00	7.22			#	-	-
Specific Conductance	umhos/cm	06/22/2020	N001	53.00	14387			#	-	-
Temperature	C	06/22/2020	N001	53.00	22.39			#	-	-
Turbidity	NTU	06/22/2020	N001	53.00	2.36			#	-	-
Uranium	mg/L	06/22/2020	0001	53.00	0.044		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0453 <well> CA

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/10/2020	0001	80.00	150	U	J	#	20	-
Oxidation Reduction Potential	mV	06/10/2020	N001	80.00	40			#	-	-
pH	s.u.	06/10/2020	N001	80.00	6.98			#	-	-
Selenium	mg/L	06/10/2020	0001	80.00	0.063		J	#	0.00066	-
Specific Conductance	umhos/cm	06/10/2020	N001	80.00	42817			#	-	-
Temperature	C	06/10/2020	N001	80.00	22.02			#	-	-
Turbidity	NTU	06/10/2020	N001	80.00	1.07			#	-	-
Uranium	mg/L	06/10/2020	0001	80.00	0.770		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0454 <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/28/2020	0001	13.00	210		J	#	20	-
Oxidation Reduction Potential	mV	05/28/2020	N001	13.00	-75			#	-	-
pH	s.u.	05/28/2020	N001	13.00	7.14			#	-	-
Specific Conductance	umhos/cm	05/28/2020	N001	13.00	57595			#	-	-
Temperature	C	05/28/2020	N001	13.00	19.36			#	-	-
Turbidity	NTU	05/28/2020	N001	13.00	7.97			#	-	-
Uranium	mg/L	05/28/2020	0001	13.00	1.900		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0457 <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/18/2020	0001	29.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	06/18/2020	N001	29.00	-99			#	-	-
pH	s.u.	06/18/2020	N001	29.00	8.30			#	-	-
Specific Conductance	umhos/cm	06/18/2020	N001	29.00	5876			#	-	-
Temperature	C	06/18/2020	N001	29.00	18.22			#	-	-
Turbidity	NTU	06/18/2020	N001	29.00	1.63			#	-	-
Uranium	mg/L	06/18/2020	0001	29.00	0.005		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0492

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/11/2020	0001	18.00	230	N	J	#	20	-
Oxidation Reduction Potential	mV	06/11/2020	N001	18.00	34			#	-	-
pH	s.u.	06/11/2020	N001	18.00	6.84			#	-	-
Specific Conductance	umhos/cm	06/11/2020	N001	18.00	18064			#	-	-
Temperature	C	06/11/2020	N001	18.00	16.92			#	-	-
Turbidity	NTU	06/11/2020	N001	18.00	8.70			#	-	-
Uranium	mg/L	06/11/2020	0001	18.00	2.300		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: AMM-1 <well> NE corner site

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/26/2020	0001	19.00	0.2	U	J	#	0.2	-
Arsenic	mg/L	05/26/2020	0001	19.00	0.0006	J	J	#	0.00012	-
Oxidation Reduction Potential	mV	05/26/2020	N001	19.00	7			#	-	-
pH	s.u.	05/26/2020	N001	19.00	7.23			#	-	-
Selenium	mg/L	05/26/2020	0001	19.00	0.010		J	#	0.00066	-
Specific Conductance	umhos/cm	05/26/2020	N001	19.00	22991			#	-	-
Temperature	C	05/26/2020	N001	19.00	20.31			#	-	-
Turbidity	NTU	05/26/2020	N001	19.00	5.66			#	-	-
Uranium	mg/L	05/26/2020	0001	19.00	0.010		J	#	1.2E-05	-

Appendix C. May/June 2020 Site-wide Sampling Event (*continued*)
Water Quality Data (*continued*)

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: AMM-2 <well> CF5

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/03/2020	0001	48.00	540		J	#	100	-
Ammonia Total as N	mg/L	06/03/2020	0002	48.00	470		J	#	20	-
Arsenic	mg/L	06/03/2020	0001	48.00	0.0014	J	J	#	0.00012	-
Arsenic	mg/L	06/03/2020	0002	48.00	0.0014	J	J	#	0.00012	-
Oxidation Reduction Potential	mV	06/03/2020	N001	48.00	36			#	-	-
pH	s.u.	06/03/2020	N001	48.00	6.86			#	-	-
Selenium	mg/L	06/03/2020	0001	48.00	0.0085	J	J	#	0.00066	-
Selenium	mg/L	06/03/2020	0002	48.00	0.0087	J	J	#	0.00066	-
Specific Conductance	umhos/cm	06/03/2020	N001	48.00	19606			#	-	-
Temperature	C	06/03/2020	N001	48.00	18.51			#	-	-
Turbidity	NTU	06/03/2020	N001	48.00	4.46			#	-	-
Uranium	mg/L	06/03/2020	0001	48.00	2.100		J	#	0.00012	-
Uranium	mg/L	06/03/2020	0002	48.00	2.100		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: ATP-2-D <well, piezometer> Piezometer; see boring ATP-2

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/02/2020	0001	88.00	440		J	#	20	-
Arsenic	mg/L	06/02/2020	0001	88.00	0.00031	J	J	#	0.00012	-
Oxidation Reduction Potential	mV	06/02/2020	N001	88.00	-300			#	-	-
pH	s.u.	06/02/2020	N001	88.00	8.18			#	-	-
Selenium	mg/L	06/02/2020	0001	88.00	0.0012	J	J	#	0.00066	-
Specific Conductance	umhos/cm	06/02/2020	N001	88.00	123068			#	-	-
Temperature	C	06/02/2020	N001	88.00	20.94			#	-	-
Turbidity	NTU	06/02/2020	N001	88.00	24.40			#	-	-
Uranium	mg/L	06/02/2020	0001	88.00	0.0014		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: ATP-2-S <well, piezometer> Piezometer; see boring ATP-2

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/02/2020	0001	25.00	57		J	#	20	-
Arsenic	mg/L	06/02/2020	0001	25.00	0.001	J	J	#	0.00012	-
Oxidation Reduction Potential	mV	06/02/2020	N001	25.00	-123			#	-	-
pH	s.u.	06/02/2020	N001	25.00	8.97			#	-	-
Selenium	mg/L	06/02/2020	0001	25.00	0.0009	J	J	#	0.00066	-
Specific Conductance	umhos/cm	06/02/2020	N001	25.00	3899			#	-	-
Temperature	C	06/02/2020	N001	25.00	21.39			#	-	-
Turbidity	NTU	06/02/2020	N001	25.00	21.50			#	-	-
Uranium	mg/L	06/02/2020	0001	25.00	0.0023		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: CR1 SW

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/11/2020	0001	0.00 - 0.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	06/11/2020	N001	0.00 - 0.00	72			#	-	-
pH	s.u.	06/11/2020	N001	0.00 - 0.00	7.72			#	-	-
Specific Conductance	umhos/cm	06/11/2020	N001	0.00 - 0.00	565			#	-	-
Temperature	C	06/11/2020	N001	0.00 - 0.00	17.46			#	-	-
Turbidity	NTU	06/11/2020	N001	0.00 - 0.00	77.50			#	-	-
Uranium	mg/L	06/11/2020	0001	0.00 - 0.00	0.0023		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: CR2 <surface location, river>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/11/2020	0001	0.00 - 0.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	06/11/2020	N001	0.00 - 0.00	20			#	-	-
pH	s.u.	06/11/2020	N001	0.00 - 0.00	7.98			#	-	-
Specific Conductance	umhos/cm	06/11/2020	N001	0.00 - 0.00	569			#	-	-
Temperature	C	06/11/2020	N001	0.00 - 0.00	18.58			#	-	-
Turbidity	NTU	06/11/2020	N001	0.00 - 0.00	82.70			#	-	-
Uranium	mg/L	06/11/2020	0001	0.00 - 0.00	0.0021		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: CR3 <surface location, river>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/11/2020	0001	0.00 - 0.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	06/11/2020	N001	0.00 - 0.00	13			#	-	-
pH	s.u.	06/11/2020	N001	0.00 - 0.00	8.13			#	-	-
Specific Conductance	umhos/cm	06/11/2020	N001	0.00 - 0.00	578			#	-	-
Temperature	C	06/11/2020	N001	0.00 - 0.00	19.70			#	-	-
Turbidity	NTU	06/11/2020	N001	0.00 - 0.00	165.00			#	-	-
Uranium	mg/L	06/11/2020	0001	0.00 - 0.00	0.0022		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: CR5 <surface location, river>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/11/2020	0001	0.00 - 0.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	06/11/2020	N001	0.00 - 0.00	6			#	-	-
pH	s.u.	06/11/2020	N001	0.00 - 0.00	7.99			#	-	-
Specific Conductance	umhos/cm	06/11/2020	N001	0.00 - 0.00	561			#	-	-
Temperature	C	06/11/2020	N001	0.00 - 0.00	18.07			#	-	-
Turbidity	NTU	06/11/2020	N001	0.00 - 0.00	674.00			#	-	-
Uranium	mg/L	06/11/2020	0001	0.00 - 0.00	0.0022		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: MW-3 <well> See borehole 8

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/03/2020	0001	44.00	420		J	#	20	-
Oxidation Reduction Potential	mV	06/03/2020	N001	44.00	39			#	-	-
pH	s.u.	06/03/2020	N001	44.00	6.84			#	-	-
Selenium	mg/L	06/03/2020	0001	44.00	0.0059	J	J	#	0.00066	-
Specific Conductance	umhos/cm	06/03/2020	N001	44.00	25779			#	-	-
Temperature	C	06/03/2020	N001	44.00	20.08			#	-	-
Turbidity	NTU	06/03/2020	N001	44.00	1.14			#	-	-
Uranium	mg/L	06/03/2020	0001	44.00	2.800		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: SMI-MW01 <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/02/2020	0001	16.00	0.84		J	#	0.2	-
Arsenic	mg/L	06/02/2020	0001	16.00	0.0026		J	#	0.00012	-
Oxidation Reduction Potential	mV	06/02/2020	N001	16.00	-59			#	-	-
pH	s.u.	06/02/2020	N001	16.00	7.53			#	-	-
Specific Conductance	umhos/cm	06/02/2020	N001	16.00	5064			#	-	-
Temperature	C	06/02/2020	N001	16.00	18.75			#	-	-
Turbidity	NTU	06/02/2020	N001	16.00	14.50			#	-	-
Uranium	mg/L	06/02/2020	0001	16.00	2.700		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: SMI-PW01 <well> Baseline Area

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/03/2020	0001	40.00	450		J	#	20	-
Oxidation Reduction Potential	mV	06/03/2020	N001	40.00	25			#	-	-
pH	s.u.	06/03/2020	N001	40.00	6.92			#	-	-
Specific Conductance	umhos/cm	06/03/2020	N001	40.00	16099			#	-	-
Temperature	C	06/03/2020	N001	40.00	20.73			#	-	-
Turbidity	NTU	06/03/2020	N001	40.00	7.42			#	-	-
Uranium	mg/L	06/03/2020	0001	40.00	2.000		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: SMI-PZ1D2 <well> Baseline Area

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/03/2020	0001	73.00	870		J	#	100	-
Oxidation Reduction Potential	mV	06/03/2020	N001	73.00	38			#	-	-
pH	s.u.	06/03/2020	N001	73.00	6.65			#	-	-
Specific Conductance	umhos/cm	06/03/2020	N001	73.00	105090			#	-	-
Temperature	C	06/03/2020	N001	73.00	18.93			#	-	-
Turbidity	NTU	06/03/2020	N001	73.00	5.86			#	-	-
Uranium	mg/L	06/03/2020	0001	73.00	1.800		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: SMI-PZ1M <well> Baseline Area

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/03/2020	0001	57.00	1500		J	#	100	-
Oxidation Reduction Potential	mV	06/03/2020	N001	57.00	43			#	-	-
pH	s.u.	06/03/2020	N001	57.00	6.75			#	-	-
Specific Conductance	umhos/cm	06/03/2020	N001	57.00	43206			#	-	-
Temperature	C	06/03/2020	N001	57.00	18.35			#	-	-
Turbidity	NTU	06/03/2020	N001	57.00	6.37			#	-	-
Uranium	mg/L	06/03/2020	0001	57.00	3.200		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: SMI-PZ1S <well> Baseline Area

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/03/2020	0001	18.00	110		J	#	20	-
Oxidation Reduction Potential	mV	06/03/2020	N001	18.00	26			#	-	-
pH	s.u.	06/03/2020	N001	18.00	7.05			#	-	-
Specific Conductance	umhos/cm	06/03/2020	N001	18.00	6077			#	-	-
Temperature	C	06/03/2020	N001	18.00	13.99			#	-	-
Turbidity	NTU	06/03/2020	N001	18.00	7.00			#	-	-
Uranium	mg/L	06/03/2020	0001	18.00	0.830		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: SMI-PZ2D <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/17/2020	0001	75.00	400		J	#	100	-
Oxidation Reduction Potential	mV	06/17/2020	N001	75.00	29			#	-	-
pH	s.u.	06/17/2020	N001	75.00	6.92			#	-	-
Specific Conductance	umhos/cm	06/17/2020	N001	75.00	116381			#	-	-
Temperature	C	06/17/2020	N001	75.00	18.72			#	-	-
Turbidity	NTU	06/17/2020	N001	75.00	0.60			#	-	-
Uranium	mg/L	06/17/2020	0001	75.00	0.370		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: SMI-PZ2M2 <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/17/2020	0001	56.00	500		J	#	100	-
Oxidation Reduction Potential	mV	06/17/2020	N001	56.00	49			#	-	-
pH	s.u.	06/17/2020	N001	56.00	6.92			#	-	-
Specific Conductance	umhos/cm	06/17/2020	N001	56.00	81896			#	-	-
Temperature	C	06/17/2020	N001	56.00	17.81			#	-	-
Turbidity	NTU	06/17/2020	N001	56.00	1.62			#	-	-
Uranium	mg/L	06/17/2020	0001	56.00	2.000		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: SMI-PZ3S <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/09/2020	0001	25.00	2.8		J	#	0.2	-
Arsenic	mg/L	06/09/2020	0001	25.00	0.020		J	#	0.00012	-
Oxidation Reduction Potential	mV	06/09/2020	N001	25.00	2			#	-	-
pH	s.u.	06/09/2020	N001	25.00	8.09			#	-	-
Selenium	mg/L	06/09/2020	0001	25.00	0.032		J	#	0.00066	-
Specific Conductance	umhos/cm	06/09/2020	N001	25.00	4724			#	-	-
Temperature	C	06/09/2020	N001	25.00	19.17			#	-	-
Turbidity	NTU	06/09/2020	N001	25.00	4.70			#	-	-
Uranium	mg/L	06/09/2020	0001	25.00	0.930		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: TP-01 <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/02/2020	0001	22.00	0.2	U	J	#	0.2	-
Arsenic	mg/L	06/02/2020	0001	22.00	0.0024		J	#	0.00012	-
Oxidation Reduction Potential	mV	06/02/2020	N001	22.00	-12			#	-	-
pH	s.u.	06/02/2020	N001	22.00	7.55			#	-	-
Specific Conductance	umhos/cm	06/02/2020	N001	22.00	7630			#	-	-
Temperature	C	06/02/2020	N001	22.00	18.44			#	-	-
Turbidity	NTU	06/02/2020	N001	22.00	3.83			#	-	-
Uranium	mg/L	06/02/2020	0001	22.00	0.050		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: TP-11 <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/26/2020	0001	30.00	0.78		J	#	0.2	-
Oxidation Reduction Potential	mV	05/26/2020	N001	30.00	-103			#	-	-
pH	s.u.	05/26/2020	N001	30.00	7.65			#	-	-
Specific Conductance	umhos/cm	05/26/2020	N001	30.00	17074			#	-	-
Temperature	C	05/26/2020	N001	30.00	18.95			#	-	-
Turbidity	NTU	05/26/2020	N001	30.00	7.90			#	-	-
Uranium	mg/L	05/26/2020	0001	30.00	0.00066		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: TP-17 <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/11/2020	0001	28.00	2.1	N	J	#	0.2	-
Oxidation Reduction Potential	mV	06/11/2020	N001	28.00	-139			#	-	-
pH	s.u.	06/11/2020	N001	28.00	8.11			#	-	-
Specific Conductance	umhos/cm	06/11/2020	N001	28.00	100607			#	-	-
Temperature	C	06/11/2020	N001	28.00	16.14			#	-	-
Turbidity	NTU	06/11/2020	N001	28.00	33.10			#	-	-
Uranium	mg/L	06/11/2020	0001	28.00	0.037		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: TP-20 <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/28/2020	0001	32.00	3.5		J	#	0.2	-
Oxidation Reduction Potential	mV	05/28/2020	N001	32.00	-209			#	-	-
pH	s.u.	05/28/2020	N001	32.00	7.17			#	-	-
Specific Conductance	umhos/cm	05/28/2020	N001	32.00	136125			#	-	-
Temperature	C	05/28/2020	N001	32.00	21.90			#	-	-
Turbidity	NTU	05/28/2020	N001	32.00	6.59			#	-	-
Uranium	mg/L	05/28/2020	0001	32.00	0.013		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: TP-22 <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/28/2020	0001	17.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	05/28/2020	N001	17.00	49			#	-	-
pH	s.u.	05/28/2020	N001	17.00	7.04			#	-	-
Specific Conductance	umhos/cm	05/28/2020	N001	17.00	33325			#	-	-
Temperature	C	05/28/2020	N001	17.00	18.28			#	-	-
Turbidity	NTU	05/28/2020	N001	17.00	16.10			#	-	-
Uranium	mg/L	05/28/2020	0001	17.00	0.580		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: TP-23 <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/28/2020	0001	25.00	160		J	#	20	-
Oxidation Reduction Potential	mV	05/28/2020	N001	25.00	32			#	-	-
pH	s.u.	05/28/2020	N001	25.00	7.07			#	-	-
Specific Conductance	umhos/cm	05/28/2020	N001	25.00	29322			#	-	-
Temperature	C	05/28/2020	N001	25.00	18.36			#	-	-
Turbidity	NTU	05/28/2020	N001	25.00	13.80			#	-	-
Uranium	mg/L	05/28/2020	0001	25.00	2.400		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: UPD-17 <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/08/2020	0001	14.50	220		J	#	20	-
Arsenic	mg/L	06/08/2020	0001	14.50	0.019		J	#	0.00012	-
Oxidation Reduction Potential	mV	06/08/2020	N001	14.50	59			#	-	-
pH	s.u.	06/08/2020	N001	14.50	6.82			#	-	-
Selenium	mg/L	06/08/2020	0001	14.50	0.100		J	#	0.00066	-
Specific Conductance	umhos/cm	06/08/2020	N001	14.50	10738			#	-	-
Temperature	C	06/08/2020	N001	14.50	16.99			#	-	-
Turbidity	NTU	06/08/2020	N001	14.50	1.33			#	-	-
Uranium	mg/L	06/08/2020	0001	14.50	1.400		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: UPD-18 <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/08/2020	0001	13.00	170		J	#	20	-
Arsenic	mg/L	06/08/2020	0001	13.00	0.020		J	#	0.00012	-
Oxidation Reduction Potential	mV	06/08/2020	N001	13.00	73			#	-	-
pH	s.u.	06/08/2020	N001	13.00	6.99			#	-	-
Selenium	mg/L	06/08/2020	0001	13.00	0.089		J	#	0.00066	-
Specific Conductance	umhos/cm	06/08/2020	N001	13.00	9240			#	-	-
Temperature	C	06/08/2020	N001	13.00	18.00			#	-	-
Turbidity	NTU	06/08/2020	N001	13.00	3.50			#	-	-
Uranium	mg/L	06/08/2020	0001	13.00	1.000		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: UPD-20 <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/09/2020	0001	17.00	0.2	U	J	#	0.2	-
Arsenic	mg/L	06/09/2020	0001	17.00	0.00047	J	J	#	0.00012	-
Oxidation Reduction Potential	mV	06/09/2020	N001	17.00	46			#	-	-
pH	s.u.	06/09/2020	N001	17.00	7.41			#	-	-
Selenium	mg/L	06/09/2020	0001	17.00	0.0014	J	J	#	0.00066	-
Specific Conductance	umhos/cm	06/09/2020	N001	17.00	3864			#	-	-
Temperature	C	06/09/2020	N001	17.00	20.64			#	-	-
Turbidity	NTU	06/09/2020	N001	17.00	13.20			#	-	-
Uranium	mg/L	06/09/2020	0001	17.00	0.064		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: UPD-21 <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/09/2020	0001	25.00	4.5		J	#	0.2	-
Arsenic	mg/L	06/09/2020	0001	25.00	0.0013	J	J	#	0.00012	-
Oxidation Reduction Potential	mV	06/09/2020	N001	25.00	48			#	-	-
pH	s.u.	06/09/2020	N001	25.00	7.20			#	-	-
Selenium	mg/L	06/09/2020	0001	25.00	0.140		J	#	0.00066	-
Specific Conductance	umhos/cm	06/09/2020	N001	25.00	5004			#	-	-
Temperature	C	06/09/2020	N001	25.00	20.64			#	-	-
Turbidity	NTU	06/09/2020	N001	25.00	1.50			#	-	-
Uranium	mg/L	06/09/2020	0001	25.00	7.200		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: UPD-22 <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/26/2020	0001	9.00	7.7		J	#	2	-
Arsenic	mg/L	05/26/2020	0001	9.00	0.0057		J	#	0.00012	-
Oxidation Reduction Potential	mV	05/26/2020	N001	9.00	26			#	-	-
pH	s.u.	05/26/2020	N001	9.00	7.83			#	-	-
Selenium	mg/L	05/26/2020	0001	9.00	0.021		J	#	0.00066	-
Specific Conductance	umhos/cm	05/26/2020	N001	9.00	3624			#	-	-
Temperature	C	05/26/2020	N001	9.00	18.18			#	-	-
Turbidity	NTU	05/26/2020	N001	9.00	2.55			#	-	-
Uranium	mg/L	05/26/2020	0001	9.00	2.300		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: UPD-23 <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/18/2020	0001	26.00	3.2		J	#	0.2	-
Arsenic	mg/L	06/18/2020	0001	26.00	0.0018	J	J	#	0.00012	-
Oxidation Reduction Potential	mV	06/18/2020	N001	26.00	33			#	-	-
pH	s.u.	06/18/2020	N001	26.00	7.84			#	-	-
Selenium	mg/L	06/18/2020	0001	26.00	0.060		J	#	0.00066	-
Specific Conductance	umhos/cm	06/18/2020	N001	26.00	3485			#	-	-
Temperature	C	06/18/2020	N001	26.00	19.86			#	-	-
Turbidity	NTU	06/18/2020	N001	26.00	5.20			#	-	-
Uranium	mg/L	06/18/2020	0001	26.00	0.800		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: UPD-24 <well>

REPORT DATE: 11/19/2020 1:22 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/09/2020	0001	27.00	2		J	#	0.2	-
Arsenic	mg/L	06/09/2020	0001	27.00	0.230		J	#	0.00012	-
Oxidation Reduction Potential	mV	06/09/2020	N001	27.00	17			#	-	-
pH	s.u.	06/09/2020	N001	27.00	7.66			#	-	-
Selenium	mg/L	06/09/2020	0001	27.00	0.051		J	#	0.00066	-
Specific Conductance	umhos/cm	06/09/2020	N001	27.00	4287			#	-	-
Temperature	C	06/09/2020	N001	27.00	19.13			#	-	-
Turbidity	NTU	06/09/2020	N001	27.00	0.91			#	-	-
Uranium	mg/L	06/09/2020	0001	27.00	4.100		J	#	0.00012	-

RECORDS: SELECTED FROM USEE105 WHERE RIN = '1912118' AND (DataValidationQualifiers IS NULL OR (DataValidationQualifiers NOT LIKE '%N%' AND DataValidationQualifiers NOT LIKE '%R%' AND DataValidationQualifiers NOT LIKE '%X%'))

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

LAB QUALIFERS:

- * Replicate analysis not within control limits.
- \+ Correlation coefficient for MSA < 0.995.
- \> Result above upper detection limit.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic & Radiochemistry: Analyte also found in method blank.
- C Pesticide result confirmed by GC-MS.
- D Analyte determined in diluted sample.
- E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- J Estimated

M GFAA duplicate injection precision not met.

N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compund (TIC).

P > 25% difference in detected pesticide or Arochlor concentrations between 2 columns.

S Result determined by method of standard addition (MSA).

U Analytical result below detection limit.

W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.

X Laboratory defined (USEPA CLP organic) qualifier, see case narrative.

Y Laboratory defined (USEPA CLP organic) qualifier, see case narrative.

Z Laboratory defined (USEPA CLP organic) qualifier, see case narrative.

DATA QUALIFERS:

F Low flow sampling method used.

L Less than 3 bore volumes purged prior to sampling.

R Unusable result.

G Possible grout contamination, pH > 9.

N Presumptive evidence that analyte is present. The analyte is "tentatively identified".

U Parameter analyzed for but was not detected.

J Estimated value.

Q Qualitative result due to sampling technique

X Location is undefined.

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

Appendix C. May/June 2020 Site-wide Sampling Event (*continued*)
Water Level Data

STATIC WATER LEVELS (USEE700) FOR SITE MOA01, Moab Site

REPORT DATE: 4/8/2020 12:54 PM

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
0401		3967.36	06/23/2020		13.10	3954.26	
0403	O	3968.95	06/23/2020		14.97	3953.98	
0404	O	3968.30	06/23/2020		13.88	3954.42	
0406	O	3964.59	06/23/2020		10.04	3954.55	
0407	O	3969.09	06/23/2020		15.50	3953.59	
0410	O	3981.12	06/08/2020		24.47	3956.65	
0411	O	3964.88	06/08/2020		8.15	3956.73	
0412	O	3962.48	06/02/2020		6.66	3955.82	
0413	O	3963.19	05/26/2020		7.82	3955.37	
0414	O	3959.20	06/03/2020		3.68	3955.52	
0430	U	4022.10	06/22/2020		60.24	3961.86	
0431	O	4007.21	06/24/2020		47.47	3959.74	
0432	U	4001.57	06/25/2020		42.00	3959.57	
0434	U	3990.21	06/25/2020		33.82	3956.39	
0435	O	3971.67	06/18/2020		14.00	3957.67	
0437	O	4048.25	06/17/2020		47.77	4000.48	
0440	O	4070.63	06/10/2020		111.50	3959.13	
0441		4008.64	06/22/2020		48.98	3959.66	
0453		4031.29	06/10/2020		0.00	4031.29	
0454		3966.53	05/28/2020		11.65	3954.88	
0456	U	3990.46	06/25/2020		34.24	3956.22	
0457	O	3971.30	06/18/2020		14.96	3956.34	
0492		3967.56	06/11/2020		13.08	3954.48	
AMM-1	U	3971.90	05/26/2020		15.95	3955.95	
AMM-2	O	3964.09	06/03/2020		9.05	3955.04	
ATP-2-D	O	3962.17	06/02/2020		6.33	3955.84	
ATP-2-S	O	3962.17	06/02/2020		9.82	3952.35	
MW-3	O	3965.98	06/03/2020		10.27	3955.71	
SMI-MW01	O	3960.29	06/02/2020		4.30	3955.99	
SMI-PW01	O	3963.96	06/03/2020		8.22	3955.74	

Appendix C. May/June 2020 Site-wide Sampling Event (*continued*)
Water Level Data (*continued*)

LOCATION CODE	FLOW CODE	TOP OF CASING ELEVATION (FT)	MEASUREMENT		DEPTH FROM TOP OF CASING (FT)	WATER ELEVATION (FT)	WATER LEVEL FLAG
			DATE	TIME			
SMI-PZ1D2	O	3968.26	06/03/2020			7.90	3960.36
SMI-PZ1M	O	3963.16	06/03/2020			6.92	3956.24
SMI-PZ1S	O	3964.13	06/03/2020			8.38	3955.75
SMI-PZ2D	O	3967.38	06/17/2020			14.56	3952.82
SMI-PZ2M2	O	3967.18	06/17/2020			13.49	3953.69
SMI-PZ3S	O	3975.03	06/09/2020			18.44	3956.59
TP-01	O	3967.71	06/02/2020			11.15	3956.56
TP-11	O	3966.61	05/26/2020			10.92	3955.69
TP-17	D	3963.69	06/11/2020			9.67	3954.02
TP-20	D	3967.55	05/28/2020			14.45	3953.10
TP-22		3966.51	05/28/2020			12.50	3954.01
TP-23		3962.60	05/28/2020			8.05	3954.55
UPD-17		3970.71	06/08/2020			11.85	3958.86
UPD-18		3968.74	06/08/2020			11.96	3956.78
UPD-20		3978.70	06/09/2020			21.71	3956.99
UPD-21		3981.47	06/09/2020			24.46	3957.01
UPD-22		3966.20	05/26/2020			10.10	3956.10
UPD-23		3982.38	06/18/2020			25.84	3956.54
UPD-24		3977.10	06/09/2020			20.40	3956.70

RECORDS: SELECTED FROM USEE700 WHERE LogDate BETWEEN '12/03/2019' AND '12/31/2019'

FLOW CODES:
D : DOWN GRADIENT
O : ON-SITE
U : UPGRADIENT

WATER LEVEL FLAGS:

Date: October 8, 2020
To: Ken Pill
From: James Ritchey
Subject: May/June 2020 Site Wide Sampling Event

Site: Moab – Site Wide Sampling Event – May/June 2020
Date of Sampling Event: May 26 – June 25, 2020
Team Members: N. Andrews and J. Ritchey
RIN Number Assigned: All samples were assigned to RIN 2005121.
Sample Shipment: Three coolers were shipped overnight UPS to ALS Laboratory from Moab, Utah, on June 4, 18 and 30 of 2020 (Tracking numbers, 1Z5W1Y510191957633, 1Z5W1Y510197408199, and 1Z5W1Y510196941408).

Number of Locations Sampled: The purpose of the Site Wide Sampling Event is to update contaminant plume maps. A total of 56 locations (eight surface samples and 48 monitoring wells) were sampled during this event. Including three duplicates and an equipment blank, a total of 60 samples were collected during the May 2020 Site Wide Sampling Event.

In addition, several locations were also analyzed for the presence of arsenic and selenium (16 locations for arsenic and 20 locations for selenium). These locations are listed in the table below.

Analyte	Location
As	0412, 0414, AMM-1, AMM-2, ATP-2-D, ATP-2-S, SMI-MW01, SMI-PZ3S, TP-01, UPD-17, UPD-18, UPD-20, UPD-21, UPD-22, UPD-23, and UPD-24
Se	0411, 0412, 0413, 0414, 0437, 0440, 0453, AMM-1, AMM-2, ATP-2-D, ATP-2-S, MW-3, SMI-PZ3S, UPD-17, UPD-18, UPD-20, UPD-21, UPD-22, UPD-23, and UPD-24

Locations Not Sampled/Reason: Wells 0432, 0433, 0455, and 0456 were not sampled due to problem with the bladder pump controller and a failure with a foot valve with the inertia pump. Field readings were collected in wells 0432 and 0456. Well 0439 was not sampled after the well casing had been damaged during excavation activities, and a pump could not be installed.

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
2000	AMM-2	Duplicate from 48 ft bgs	Ground Water
2001	0218	Duplicate	Surface Water
2002	NA	Equipment Blank	DI Water
2003	0407	Duplicate from 17 bgs	Ground Water

Location Specific Information: All of the observation wells were sampled using a peristaltic pump and dedicated tubing unless otherwise noted. The surface water samples were collected with dedicated surface water tubing that was decontaminated with Alconox® and de-ionized water between locations. The table below provides additional information:

Location	Date	Sample Depth (ft bgs)	Comments
0201	6/11/2020	NA	4 ft out, 2 ft deep, moderate current, turbid.
0218	6/11/2020	NA	Swift and riffly, 10 ft out. 1ft deep.
0226	6/11/2020	NA	3 ft out, 1.5 ft deep, moderate current.
0274	6/11/2020	NA	6 ft out, 2 ft deep, very low flow, turbid.
0401	6/23/2020	18	
0403	6/23/2020	18	
0404	6/23/2020	18	
0406	6/23/2020	18	Floating debris in water.
0407	6/23/2020	17	Duplicate 2003 – May 057
0410	6/8/2020	23.5	Dewatered at 1.5L. Sample taken.
0411	6/8/2020	8	Dewatered at 200mL. Came back 6/9/20 for unfiltered samples. Samples filtered in lab.
0412	6/2/2020	9.5	
0413	5/26/2020	10.5	
0414	6/3/2020	7.5	
0430	6/22/2020	101	Bladder pump.
0431	6/24/2020	91	
0432	6/25/2020	55	Pump controller stopped working. No sample taken.
0434	6/25/2020	35	
0435	6/18/2020	173	
0437	6/17/2020	(97)	Bladder pump. Sample intake depth and total depth taken from past sampling events. Sample depth correlates with historical sample depth.
0440	6/10/2020	117	Bladder pump.
0441	6/22/2020	53	Bladder pump.
0453	6/10/2020	80	Bladder pump. Water level below pump.
0454	5/28/2020	13	Sulfury smell.
0456	6/25/2020	53	Inertia pump. Foot valve fell out. No sample taken.
0457	6/18/2020	29	Restart with new tubing
0492	6/11/2020	18	
AMM-1	5/26/2020	19	
AMM-2	6/3/2020	48	Duplicate 2000 – MAY 016
ATP-2-D	6/2/2020	88	
ATP-2-S	6/2/2020	25	
CR1	6/11/2020	NA	6 ft out, 3 ft deep. Very flow current on eddy line.
CR2	6/11/2020	NA	10 ft out, 1.5 ft deep, swift current, turbid.
CR3	6/11/2020	NA	1 ft out, 2 ft deep, low flow.
CR5	6/11/2020	NA	2 ft deep, 2 ft out, low flow, turbid.
MW-3	6/3/2020	44	
SMI-MW01	6/2/2020	16	
SMI-PW01	6/3/2020	40	
SMI-PZ1D2	6/3/2020	73	
SMI-PZ1M	6/3/2020	57	
SMI-PZ1S	6/3/2020	18	

Location	Date	Sample Depth (ft bgs)	Comments
SMI-PZ2M2	6/17/2020	56	
SMI-PZ2D	6/17/2020	75	
SMI-PZ3S	6/9/2020	25	
TP-01	6/2/2020	22	
TP-11	5/26/2020	30	
TP-17	6/11/2020	28	Black floaties preventing turbidity clearing.
TP-20	5/28/2020	32	
TP-22	5/28/2020	17	
TP-23	5/28/2020	25	Water dropping so sample taken with slightly high turbidity.
UPD-17	6/8/2020	14.5	
UPD-18	6/8/2020	13	
UPD-20	6/9/2020	17	Stabilized.
UPD-21	6/9/2020	25	
UPD-22	5/26/2020	9	
UPD-23	6/18/2020	26	
UPD-24	6/9/2020	27	

Notes: ft bgs = feet below ground surface

Water Level Measurements: Water level data are provided in the table below. These data represent depth to water (ft btoc) measurements.

Location	Date	Depth to Water (ft btoc)
0401	6/23/2020	13.10
0403	6/23/2020	14.97
0404	6/23/2020	13.88
0406	6/23/2020	10.04
0407	6/23/2020	15.50
0410	6/8/2020	24.47
0411	6/8/2020	8.15
0412	6/2/2020	6.66
0413	5/26/2020	7.82
0414	6/3/2020	3.68
0430	6/22/2020	60.24
0431	6/24/2020	47.47
0432	6/25/2020	42.0
0434	6/25/2020	33.82
0435	6/18/2020	14.0
0437	6/17/2020	47.97
0440	6/10/2020	111.50
0441	6/22/2020	48.98
0453	6/10/2020	NA*
0454	5/28/2020	11.65
0456	6/25/2020	34.24
0457	6/18/2020	14.96
0492	6/11/2020	13.08

Location	Date	Depth to Water (ft btoc)
AMM-1	5/26/2020	15.95
AMM-2	6/3/2020	9.05
ATP-2-D	6/2/2020	6.33
ATP-2-S	6/2/2020	9.82
MW-3	6/3/2020	10.27
SMI-MW01	6/2/2020	4.30
SMI-PW01	6/3/2020	8.22
SMI-PZ1D2	6/3/2020	7.90
SMI-PZ1M	6/3/2020	6.92
SMI-PZ1S	6/3/2020	8.38
SMI-PZ2M2	6/17/2020	13.49
SMI-PZ2D	6/17/2020	14.56
SMI-PZ3S	6/9/2020	18.44
TP-01	6/2/2020	11.15
TP-11	5/26/2020	10.92
TP-17	6/11/2020	9.67
TP-20	5/28/2020	14.45
TP-22	5/28/2020	12.50
TP-23	5/28/2020	8.05
UPD-17	6/8/2020	11.85
UPD-18	6/8/2020	11.96
UPD-20	6/9/2020	21.71
UPD-21	6/9/2020	24.46
UPD-22	5/26/2020	10.10
UPD-23	6/18/2020	25.84
UPD-24	6/9/2020	20.40

*Water level could not be obtained.

Well Inspection Summary: A well inspection was not conducted.

Equipment: None.

Regulatory: None.

Site Issues: According to the USGS Cisco Gaging Station (Station No. 09180500), the mean daily Colorado River flow during this sampling event is provided below: