Data Validation Package

July 2010
Groundwater and Surface Water Sampling at the Naturita, Colorado, Disposal and Processing Sites

October 2010

U.S. DEPARTMENT OF ENERGY | Legacy Management

This page intentionally left blank

Contents

This page intentionally left blank

Sampling Event Summary

Site: Naturita Processing Site and Disposal Site

Sampling Period: July 27−28, 2010

This sampling event includes sampling groundwater and surface water at the Naturita Processing Site and groundwater at the Naturita Disposal Site. Sampling and analysis were conducted as specified in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites* (LMS/PLN/S04351, continually updated) and the *Environmental Procedures Catalog* (LMS/PRO/S04325, continually updated). Duplicate samples were collected from locations NAT01-1 (processing site) and BR95-2 (disposal site). An equipment blank was also collected during this sampling event.

The 2002 *Ground Water Compliance Action Plan for the Naturita, Colorado, UMTRA Project Site* requires annual monitoring to observe the effectiveness of the groundwater compliance strategy at the site. The sampling conducted included monitoring wells BR95-1, BR95-2, BR95-3, DM1, MAU07, MAU08, NAT01-1, NAT02, NAT08, NAT26, 0715, and 0718 and surface locations 0531, 0533, SM2, and SM4. The water level was measured at each sampled well.

Time-concentration graphs show that uranium and vanadium concentrations in the wells sampled tend to be decreasing and remain below the proposed alternate concentration limits.

Surface water results from San Miguel River locations downstream of and adjacent to the site were compared to statistical benchmark values derived using historical data from location 0531, which is located upstream of the site on the San Miguel River. As shown in Table 1, no benchmark values were exceeded during this event, which indicates that the site is having no measurable impact on river water quality.

Table 1. Comparison of San Miguel River July 2010 Concentrations to Benchmarks

Analyte	Benchmark Value for 0531 (mg/L)	0531 Concentration (mg/L)	SM2 Concentration (mg/L)	SM4 Concentration (mg/L)	0533 Concentration (mg/L)
Uranium	0.0045	0.0016	0.0022	0.0026	0.0025
Vanadium	0.0050	0.00063	0.00086	0.0009	0.00097

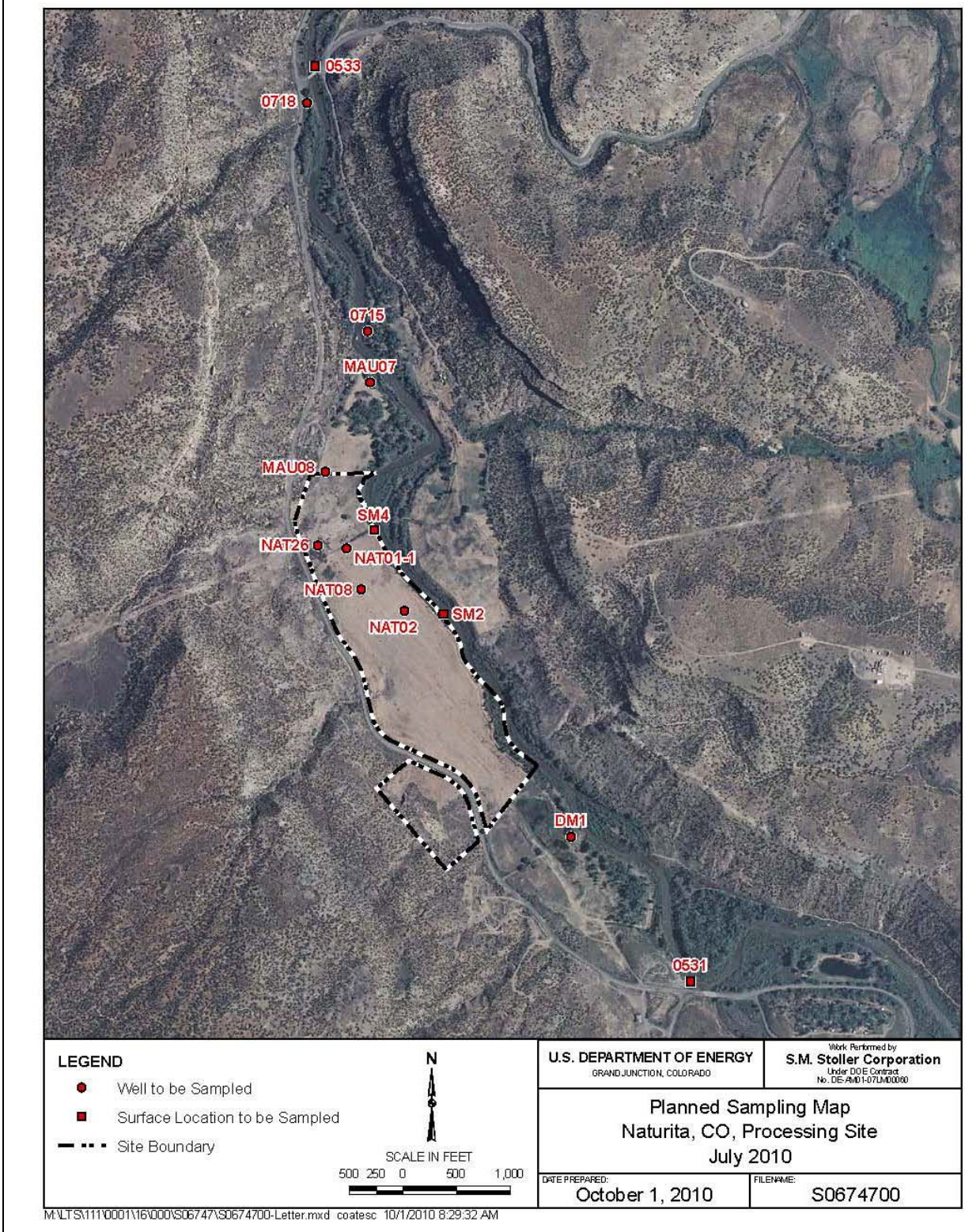
The 1999 *Long-Term Surveillance Plan for the Upper Burbank Disposal Cell Uravan, Colorado*, requires biennial monitoring to detect potential seepage from the disposal cell in three monitoring wells BR95-1, BR95-2, and BR95-3. Arsenic and molybdenum are detected in these wells but generally at an order of magnitude below the maximum concentration limit and have remained essentially constant since 2002. Vanadium is detected in BR95-2 but it is also an order of magnitude below the background level. Uranium has been detected in samples from all three of these wells, and remains above the maximum concentration limit in wells BR95-1 and

BR95-2. However, comparable concentrations of uranium have been present in samples collected since the beginning of the monitoring period (see the time-concentration graphs) and have not changed appreciably.

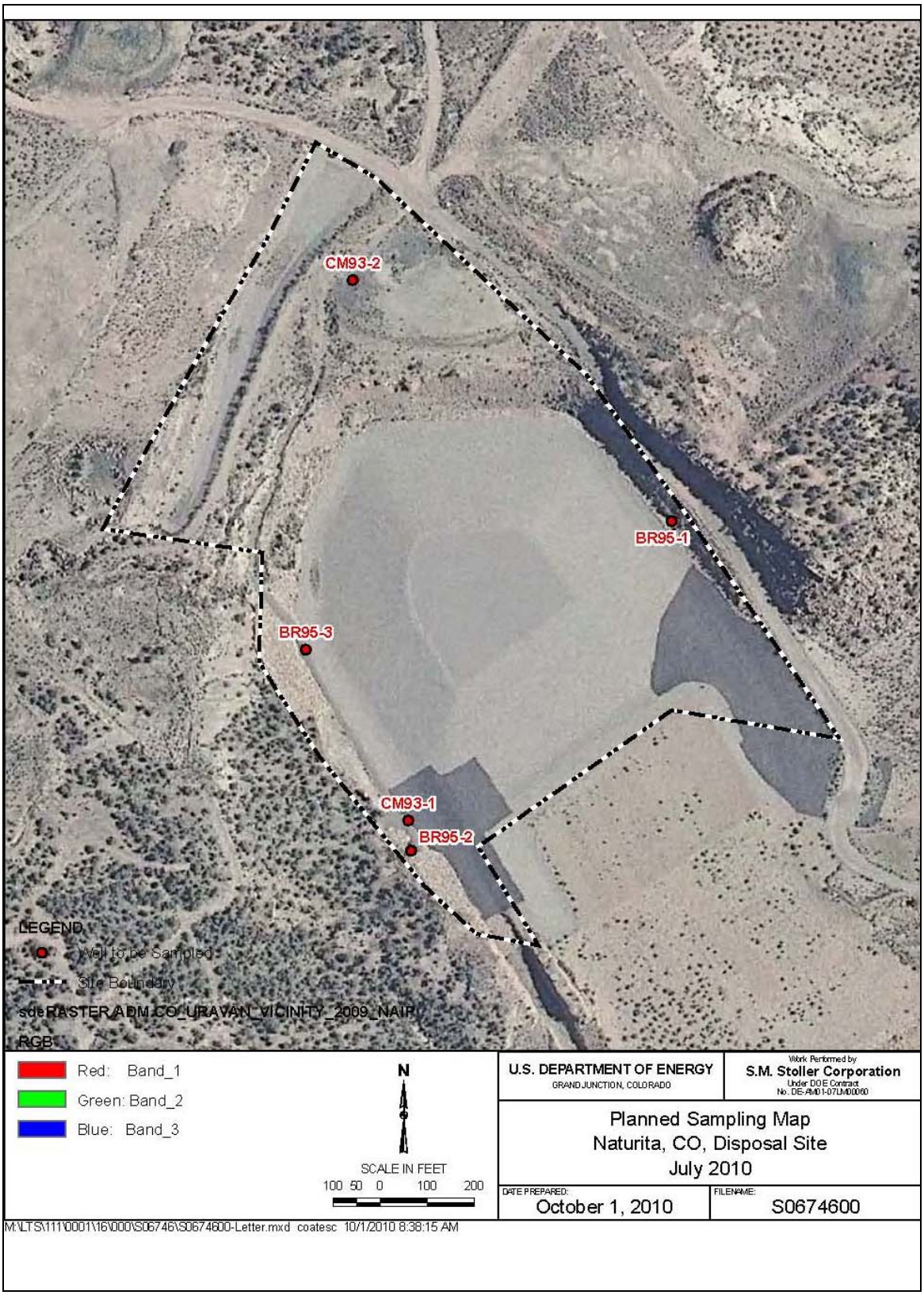
Additionally, in November 2006, Umetco Minerals Corporation provided DOE with results from water-quality-data samples collected at a groundwater seep that is considered (by Umetco) to be a background location for its Title II Site at Uravan and indicative of contaminant conditions for groundwater in the area. Uranium concentrations in these samples ranged from 2.00 to 2.59 mg/L, which is at least an order of magnitude greater than the highest concentrations seen in Department of Energy's BR95-series wells. The groundwater seep location sampled by Umetco is located approximately 1,900 feet north-northwest of well CM93-2 and issues from the base of the Salt Wash member of the Morrison Formation at the contact with the Summerville Formation. This is the same zone where the Naturita Disposal Cell BR-series monitoring wells are completed.

David Traub
Site Lead, S.M. Stoller

11-1-10
Date



Naturita, Colorado, Processing Site Sample Location Map



Naturita, Colorado, Disposal Site Sample Location Map

Data Assessment Summary

This page intentionally left blank

Water Sampling Field Activities Verification Checklist

Project	Naturita, Colorado	**Date(s) of Water Sampling**	July 27−28, 2010
Date(s) of Verification	September 29, 2010	**Name of Verifier**	Gretchen Baer

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures?	Yes	
List other documents, SOPs, instructions.		Work Order Letter dated July 1, 2010.
2. Were the sampling locations specified in the planning documents sampled?	No	Disposal site wells CM93–1 and CM93–2 could not be sampled by bailing as planned because pumps are installed in the wells. Equipment needed to remove or operate these pumps was not available.
3. Was a pre-trip calibration conducted as specified in the above-named documents?	Yes	Pre-trip calibration was performed on July 27, 2010.
4. Was an operational check of the field equipment conducted daily?	Yes	
Did the operational checks meet criteria?	Yes	pH pre-trip calibration: the pH 10 mv was slightly out of range, which is acceptable.
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	Yes	
6. Was the category of the well documented?	Yes	
7. Were the following conditions met when purging a Category I well:		
Was one pump/tubing volume purged prior to sampling?	No	At BR95–1 the site lead directed that samples be taken before the minimum volume was purged because of poor pump performance. All field and laboratory results will be flagged as qualitative due to sampling technique.
Did the water level stabilize prior to sampling?	Yes	
Did pH, specific conductance, and turbidity measurements stabilize prior to sampling?	Yes	
Was the flow rate less than 500 mL/min?	Yes	
If a portable pump was used, was there a 4-hour delay between pump installation and sampling?	NA	

Water Sampling Field Activities Verification Checklist (continued)

	Response (Yes, No, NA)	Comments
8. Were the following conditions met when purging a Category II well:		
Was the flow rate less than 500 mL/min?	NA	There were no Category II wells.
Was one pump/tubing volume removed prior to sampling?	NA	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	Duplicate samples were collected from NAT01-1 and BR95-2.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	Yes	One equipment blank was collected.
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were QC samples assigned a fictitious site identification number?	Yes	Location IDs 2516 and 2517 were used for QC samples.
Was the true identity of the samples recorded on the Quality Assurance Sample Log or in the Field Data Collection System (FDCS) report?	Yes	QC samples are also listed in the trip report.
13. Were samples collected in the containers specified?	Yes	
14. Were samples filtered and preserved as specified?	Yes	
15. Were the number and types of samples collected as specified?	Yes	
16. Were chain of custody records completed and was sample custody maintained?	Yes	
17. Are field data sheets signed and dated by both team members (hardcopies) or are dates present for the “Date Signed” fields (FDCS)?	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	

Laboratory Performance Assessment

General Information

Report Number (RIN):	10073227
Sample Event:	July 27−28, 2010
Site(s):	Naturita, CO, Processing and Disposal Sites
Laboratory:	ALS Laboratory Group, Fort Collins, Colorado
Work Order No.:	1007354
Analysis:	Metals and Wet Chemistry
Validator:	Gretchen Baer
Review Date:	September 29, 2010

This validation was performed according to the *Environmental Procedures Catalog*, (LMS/PRO/S04325, continually updated) "Standard Practice for Validation of Laboratory Data." The procedure was applied at Level 3, Data Validation. See attached Data Validation Worksheets for supporting documentation on the data review and validation. All analyses were successfully completed. The samples were prepared and analyzed using accepted procedures based on methods specified by line item code, which are listed in Table 2.

Table 2. Analytes and Methods

Analyte	Line Item Code	Prep Method	Analytical Method
Total Dissolved Solids	WCH-A-033	MCAWW 160.1	MCAWW 160.1
Metals: Arsenic, Uranium, Vanadium	LMM-02	SW-846 3005A	SW-846 6020A

Data Qualifier Summary

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

Table 3. Data Qualifier Summary

Sample Number	Location	Analyte	Flag	Reason
1007354-1	0531	Vanadium	J	Intercept greater than 3 times MDL
1007354-2	0533	Vanadium	J	Intercept greater than 3 times MDL
1007354-3	0715	Vanadium	J	Intercept greater than 3 times MDL
1007354-4	0718	Vanadium	U	Less than 5 times the method blank
1007354-8	BR95-1	Vanadium	U	Less than 5 times the method blank
1007354-10	BR95-3	Vanadium	U	Less than 5 times the method blank
1007354-11	DM1	Vanadium	U	Less than 5 times the method blank
1007354-12	MAU07	Vanadium	U	Less than 5 times the method blank
1007354-13	MAU08	Vanadium	U	Less than 5 times the method blank
1007354-17	NAT26	Vanadium	J	Intercept greater than 3 times MDL
1007354-18	SM2	Vanadium	J	Intercept greater than 3 times MDL
1007354-19	SM4	Vanadium	J	Intercept greater than 3 times MDL

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received 19 water samples on July 30, 2010, accompanied by a Chain of Custody form. The Chain of Custody form was checked to confirm that all of the samples were listed with sample collection dates and times, and that signatures and dates were present indicating sample relinquishment and receipt. The Chain of Custody form was complete with no errors or omissions. A copy of the air waybill was included with the receiving documentation.

Preservation and Holding Times

The sample shipment was received intact with the temperature inside the iced cooler at 2.0 °C, which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses and all samples were analyzed within the applicable holding times.

Laboratory Instrument Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for all analytes. Initial calibration demonstrates that 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 that the instrument continues to be capable of producing acceptable qualitative and quantitative data. All laboratory instrument calibrations were performed correctly in accordance with the cited methods.

Method MCAWW 160.1

There are no calibration requirements associated with the determination of total dissolved solids.

Method SW-846 6020

Calibrations were performed on August 23, 2010, using four calibration standards. The calibration curve correlation coefficient values were greater than 0.995 and, with the exception of vanadium, the absolute values of the intercepts were less than 3 times the method detection limit (MDL). For vanadium, all associated detects less than 3 times the intercept are qualified with a "J" flag (estimated). Calibration and laboratory spike standards were prepared from independent sources. Initial and continuing calibration verification checks were made at the required frequency resulting in four verification checks. All calibration checks met the acceptance criteria. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curve near the practical quantitation limit (PQL) and all results were within the acceptance range. Mass calibration and resolution verifications were performed at the beginning of each analytical run in accordance with the analytical procedure. Internal standard recoveries associated with requested analytes were stable and within acceptable ranges.

Method and Calibration Blanks

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. Calibration blanks are analyzed to assess instrument contamination prior to and during sample analysis. All method blank and calibration blank results associated with the samples were below the PQLs for all analytes. In cases where a blank concentration exceeds the MDL, the associated sample results are qualified with a "U" flag (not detected) when the sample result is greater than the MDL but less than 5 times the blank concentration.

Matrix Spike Analysis

Matrix spike and matrix spike duplicate (MS/MSD) samples are used to measure method performance in the sample matrix. The MS/MSD data are not evaluated when the concentration of the unspiked sample is greater than 4 times the spike concentration. The spikes met the recovery and precision criteria for all analytes evaluated.

Laboratory Replicate Analysis

Laboratory replicate analyses are used to determine laboratory precision for each sample matrix. The relative percent difference for replicate results that are greater than 5 times the PQL should be less than 20 percent. For results that are less than the PQL, the range should be no greater than the PQL. The replicate results met these criteria, demonstrating acceptable laboratory precision.

Laboratory Control Sample

Laboratory control samples were analyzed at the correct frequency to provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. All control sample results were acceptable.

Metals Serial Dilution

Serial dilutions were prepared and analyzed for the metals analyses to monitor chemical or physical interferences in the sample matrix. Method 6020 serial dilution data are evaluated when the concentration of the undiluted sample is greater than 100 times the PQL. The laboratory flagged a vanadium result for serial dilution failure, but the sample concentration was less than 100 times the PQL, so no further qualification is necessary. All other evaluated serial dilution data were acceptable.

Detection Limits/Dilutions

Samples were diluted in a consistent and acceptable manner when required. The required detection limits were met for all analytes.

Completeness

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

Electronic Data Deliverable (EDD) File

The EDD file arrived on August 31, 2010, and the data were loaded into SEEPro on September 26, 2010. The Sample Management System EDD validation module was used to verify that the EDD file was complete and in compliance with requirements. The module compares the contents of the file to the requested analyses to ensure all and only the requested data are delivered. The contents of the EDD were manually examined to verify that the sample results accurately reflect the data contained in the sample data package.

SAMPLE MANAGEMENT SYSTEM
General Data Validation Report

RIN: 10073227 **Lab Code:** PAR **Validator:** Gretchen Baer **Validation Date:** 9/29/2010

Project: Naturita **Analysis Type:** ☑ Metals ☑ General Chem ☐ Rad ☐ Organics

# of Samples: 19 **Matrix:** WATER **Requested Analysis Completed:** Yes

Chain of Custody

Present: OK **Signed:** OK **Dated:** OK

Sample

Integrity: OK **Preservation:** OK **Temperature:** OK

Select Quality Parameters

☑ Holding Times	All analyses were completed within the applicable holding times.
☑ Detection Limits	The reported detection limits are equal to or below contract requirements.
☑ Field/Trip Blanks	There was 1 trip/equipment blank evaluated.
☑ Field Duplicates	There were 2 duplicates evaluated.

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 10073227 **Lab Code:** PAR **Date Due:** 8/27/2010

Matrix: Water **Site Code:** NAT **Date Completed:** 9/2/2010

Analyte	Date Analyzed	CALIBRATION						Method Blank	LCS %R	MS %R	MSD %R	Dup. RPD	ICSAB %R	Serial Dil. %R	CRI %R
		Int.	R^2	ICV	CCV	ICB	CCB								
Arsenic	08/23/2010	-0.0080	1.0000	OK	OK	OK	OK	OK	101.0	99.0	94.0	5.0	107.0		106.0
Arsenic	08/23/2010														96.0
Molybdenum	08/23/2010	-0.0100	1.0000	OK	OK	OK	OK	OK	100.0	100.0	95.0	5.0	108.0		102.0
Molybdenum	08/23/2010											1.0			101.0
Uranium	08/23/2010	-0.0020	1.0000	OK	OK	OK	OK	OK	99.0			5.0	105.0	3.0	100.0
Uranium	08/23/2010											2.0			100.0
Vanadium	08/23/2010	-0.5500	1.0000	OK	OK	OK	OK	OK	97.0	98.0	94.0	5.0	102.0		97.0
Vanadium	08/23/2010											0.0			105.0

SAMPLE MANAGEMENT SYSTEM

Wet Chemistry Data Validation Worksheet

RIN: 10073227 **Lab Code:** PAR **Date Due:** 8/27/2010

Matrix: Water **Site Code:** NAT **Date Completed:** 9/2/2010

Analyte	Date Analyzed	CALIBRATION						Method Blank	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R^2	ICV	CCV	ICB	CCB						
Total Dissolved Solids	08/03/2010							OK	100.00			1.00	

Sampling Quality Control Assessment

The following information summarizes and assesses quality control for this sampling event.

Sampling Protocol

All wells were sampled with dedicated tubing using the low-flow purge procedure. Sample results for all wells were qualified with an "F" flag in the database, indicating the wells were purged and sampled using the low-flow sampling method. All wells met the Category I criteria with the following exception. At BR95–1 the site lead directed that samples be taken before the minimum volume was purged because of poor pump performance. All field and laboratory results for BR95–1 are qualified with a "Q" flag, indicating the data are qualitative because of the sampling technique.

Surface water locations were sampled using a peristaltic pump and tubing reel.

Equipment Blank

An equipment blank (field ID 2986) was collected after decontamination of equipment used to collect surface water samples. Uranium was detected in the equipment blank. All uranium sample results were greater than 5 times the equipment blank, so no data qualification is necessary. The equipment blank results indicate adequate decontamination of the sampling equipment.

Field Duplicate Analysis

Field duplicate samples are collected and analyzed as an indication of overall precision of the measurement process. The precision observed includes both field and laboratory precision and has more variability than laboratory duplicates, which measure only laboratory performance. Duplicate samples were collected from location BR95–2 and NAT01–1. The duplicate results met the Environmental Protection Agency recommended laboratory duplicate criteria of less than 20 percent relative difference for results that are greater than 5 times the PQL, indicating acceptable overall precision.

SAMPLE MANAGEMENT SYSTEM

Validation Report: Field Duplicates

RIN: 10073227 **Lab Code:** PAR **Project:** Naturita **Validation Date:** 9/29/2010

Duplicate: 2516 **Sample:** BR95-2

Analyte	Sample Result	Sample Flag	Sample Error	Sample Dilution	Duplicate Result	Duplicate Flag	Duplicate Error	Duplicate Dilution	RPD	RER	Units
Arsenic	0.39			2	0.43			2	9.76		UG/L
Molybdenum	2.2			2	2.3			2	4.44		UG/L
TOTAL DISSOLVED SOLIDS	650			1	660			1	1.53		MG/L
Uranium	48			2	51			2	6.06		UG/L
Vanadium	3.9			2	4.2	E		2	7.41		UG/L

Duplicate: 2517 **Sample:** NAT01-1

Analyte	Sample Result	Sample Flag	Sample Error	Sample Dilution	Duplicate Result	Duplicate Flag	Duplicate Error	Duplicate Dilution	RPD	RER	Units
Arsenic	8.2			1	8.1			1	1.23		UG/L
TOTAL DISSOLVED SOLIDS	1500			1	1500			1	0		MG/L
Uranium	640			20	630			20	1.57		UG/L
Vanadium	2.3			1	2.2			1	4.44		UG/L

Certification

All laboratory analytical quality control criteria were met except as qualified in this report. The data qualifiers listed on the SEEPro database reports are defined on the last page of each report. All data in this package are considered validated and available for use.

Laboratory Coordinator: Steve Donivan — Date: 10-29-2010

Data Validation Lead: Gretchen Baer — Date: 10/29/10

Attachment 1
Assessment of Anomalous Data

This page intentionally left blank

Potential Outliers Report

This page intentionally left blank

Potential Outliers Report

Potential outliers are measurements that are extremely large or small relative to the rest of the data and, therefore, are suspected of misrepresenting the population from which they were collected. Potential outliers may result from transcription errors, data-coding errors, or measurement system problems. However, outliers may also represent true extreme values of a distribution and indicate more variability in the population than was expected.

Statistical outlier tests give probabilistic evidence that an extreme value does not "fit" with the distribution of the remainder of the data and is therefore a statistical outlier. These tests should only be used to identify data points that require further investigation. The tests alone cannot determine whether a statistical outlier should be discarded or corrected within a data set.

There are three steps involved in identifying extreme values or outliers:

1. Identify extreme values that may be potential outliers by generating the Outliers Report using the Sample Management System from data in the SEEPro database. The application compares the new data set with historical data and lists the new data that fall outside the historical data range. A determination is also made if the data are normally distributed using the Shapiro-Wilk Test.
2. Apply the appropriate statistical test. Dixon's Extreme Value test is used to test for statistical outliers when the sample size is less than or equal to 25. This test considers both extreme values that are much smaller than the rest of the data (case 1) and extreme values that are much larger than the rest of the data (case 2). This test is valid only if the data without the suspected outlier are normally distributed. Rosner's Test is a parametric test that is used to detect outliers for sample sizes of 25 or more. This test also assumes that the data without the suspected outliers are normally distributed.
3. Scientifically review statistical outliers and decide on their disposition.

There were no potential outliers identified, and the data for this event are acceptable as qualified.

This page intentionally left blank

Attachment 2
Data Presentation

This page intentionally left blank

Groundwater Quality Data

This page intentionally left blank

Groundwater Quality Data by Location (USEE100) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 9/30/2010
Location: 0715 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	07/28/2010	N001	5.49	-	10.42	210		F	#		
Arsenic	mg/L	07/28/2010	N001	5.49	-	10.42	0.0044		F	#	0.00003	
Oxidation Reduction Potential	mV	07/28/2010	N001	5.49	-	10.42	-26.1		F	#		
pH	s.u.	07/28/2010	N001	5.49	-	10.42	7.22		F	#		
Specific Conductance	umhos /cm	07/28/2010	N001	5.49	-	10.42	954		F	#		
Temperature	C	07/28/2010	N001	5.49	-	10.42	16.42		F	#		
Total Dissolved Solids	mg/L	07/28/2010	N001	5.49	-	10.42	690		F	#	20	
Turbidity	NTU	07/28/2010	N001	5.49	-	10.42	6.9		F	#		
Uranium	mg/L	07/28/2010	N001	5.49	-	10.42	0.067		F	#	0.0000058	
Vanadium	mg/L	07/28/2010	N001	5.49	-	10.42	0.0029		JF	#	0.00003	

Groundwater Quality Data by Location (USEE100) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 9/30/2010
Location: 0718 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	07/27/2010	N001	8.6	-	18.6	364		F	#		
Arsenic	mg/L	07/27/2010	N001	8.6	-	18.6	0.0031		F	#	0.000015	
Oxidation Reduction Potential	mV	07/27/2010	N001	8.6	-	18.6	-30.2		F	#		
pH	s.u.	07/27/2010	N001	8.6	-	18.6	7.02		F	#		
Specific Conductance	umhos /cm	07/27/2010	N001	8.6	-	18.6	1987		F	#		
Temperature	C	07/27/2010	N001	8.6	-	18.6	14.24		F	#		
Total Dissolved Solids	mg/L	07/27/2010	N001	8.6	-	18.6	1500		F	#	40	
Turbidity	NTU	07/27/2010	N001	8.6	-	18.6	9.47		F	#		
Uranium	mg/L	07/27/2010	N001	8.6	-	18.6	0.066		F	#	0.0000058	
Vanadium	mg/L	07/27/2010	N001	8.6	-	18.6	0.00032		UF	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 9/30/2010
Location: DM1 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	07/28/2010	N001	2.67	-	7.67	179		F	#		
Arsenic	mg/L	07/28/2010	N001	2.67	-	7.67	0.0017		F	#	0.000015	
Oxidation Reduction Potential	mV	07/28/2010	N001	2.67	-	7.67	-22.9		F	#		
pH	s.u.	07/28/2010	N001	2.67	-	7.67	6.87		F	#		
Specific Conductance	umhos /cm	07/28/2010	N001	2.67	-	7.67	654		F	#		
Temperature	C	07/28/2010	N001	2.67	-	7.67	18.61		F	#		
Total Dissolved Solids	mg/L	07/28/2010	N001	2.67	-	7.67	420		F	#	20	
Turbidity	NTU	07/28/2010	N001	2.67	-	7.67	3		F	#		
Uranium	mg/L	07/28/2010	N001	2.67	-	7.67	0.0029		F	#	0.0000029	
Vanadium	mg/L	07/28/2010	N001	2.67	-	7.67	0.00023		UF	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 9/30/2010
Location: MAU07 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	07/27/2010	N001	2.92	-	7.92	400		F	#		
Arsenic	mg/L	07/27/2010	N001	2.92	-	7.92	0.0047		F	#	0.000015	
Oxidation Reduction Potential	mV	07/27/2010	N001	2.92	-	7.92	-14.1		F	#		
pH	s.u.	07/27/2010	N001	2.92	-	7.92	6.89		F	#		
Specific Conductance	umhos /cm	07/27/2010	N001	2.92	-	7.92	2198		F	#		
Temperature	C	07/27/2010	N001	2.92	-	7.92	18.69		F	#		
Total Dissolved Solids	mg/L	07/27/2010	N001	2.92	-	7.92	1700		F	#	40	
Turbidity	NTU	07/27/2010	N001	2.92	-	7.92	5.43		F	#		
Uranium	mg/L	07/27/2010	N001	2.92	-	7.92	0.54		F	#	0.000029	
Vanadium	mg/L	07/27/2010	N001	2.92	-	7.92	0.00043		UF	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 9/30/2010
Location: MAU08 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	07/27/2010	N001	6.17	-	11.17	483		F	#		
Arsenic	mg/L	07/27/2010	N001	6.17	-	11.17	0.00048		F	#	0.000015	
Oxidation Reduction Potential	mV	07/27/2010	N001	6.17	-	11.17	12.8		F	#		
pH	s.u.	07/27/2010	N001	6.17	-	11.17	7.08		F	#		
Specific Conductance	umhos /cm	07/27/2010	N001	6.17	-	11.17	3129		F	#		
Temperature	C	07/27/2010	N001	6.17	-	11.17	17.16		F	#		
Total Dissolved Solids	mg/L	07/27/2010	N001	6.17	-	11.17	2200		F	#	40	
Turbidity	NTU	07/27/2010	N001	6.17	-	11.17	6.22		F	#		
Uranium	mg/L	07/27/2010	N001	6.17	-	11.17	0.73		F	#	0.000058	
Vanadium	mg/L	07/27/2010	N001	6.17	-	11.17	0.00037		UF	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 9/30/2010
Location: NAT01-1 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	07/27/2010	N001	17	-	17.5	321		F	#		
Arsenic	mg/L	07/27/2010	N001	17	-	17.5	0.0082		F	#	0.000015	
Arsenic	mg/L	07/27/2010	N002	17	-	17.5	0.0081		F	#	0.000015	
Oxidation Reduction Potential	mV	07/27/2010	N001	17	-	17.5	-7.7		F	#		
pH	s.u.	07/27/2010	N001	17	-	17.5	7.01		F	#		
Specific Conductance	umhos /cm	07/27/2010	N001	17	-	17.5	1997		F	#		
Temperature	C	07/27/2010	N001	17	-	17.5	15.65		F	#		
Total Dissolved Solids	mg/L	07/27/2010	N001	17	-	17.5	1500		F	#	40	
Total Dissolved Solids	mg/L	07/27/2010	N002	17	-	17.5	1500		F	#	40	
Turbidity	NTU	07/27/2010	N001	17	-	17.5	4.52		F	#		
Uranium	mg/L	07/27/2010	N001	17	-	17.5	0.64		F	#	0.000058	
Uranium	mg/L	07/27/2010	N002	17	-	17.5	0.63		F	#	0.000058	
Vanadium	mg/L	07/27/2010	N001	17	-	17.5	0.0023		F	#	0.000015	
Vanadium	mg/L	07/27/2010	N002	17	-	17.5	0.0022		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 9/30/2010
Location: NAT02 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	07/27/2010	N001	6.42	-	11.42	211		F	#		
Arsenic	mg/L	07/27/2010	N001	6.42	-	11.42	0.006		F	#	0.00015	
Oxidation Reduction Potential	mV	07/27/2010	N001	6.42	-	11.42	-17.5		F	#		
pH	s.u.	07/27/2010	N001	6.42	-	11.42	7.25		F	#		
Specific Conductance	umhos /cm	07/27/2010	N001	6.42	-	11.42	1021		F	#		
Temperature	C	07/27/2010	N001	6.42	-	11.42	18.31		F	#		
Total Dissolved Solids	mg/L	07/27/2010	N001	6.42	-	11.42	730		F	#	20	
Turbidity	NTU	07/27/2010	N001	6.42	-	11.42	9.27		F	#		
Uranium	mg/L	07/27/2010	N001	6.42	-	11.42	0.16		F	#	0.000029	
Vanadium	mg/L	07/27/2010	N001	6.42	-	11.42	0.63		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 9/30/2010
Location: NAT08 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	07/27/2010	N001	6.3	-	11.3	310		F	#		
Arsenic	mg/L	07/27/2010	N001	6.3	-	11.3	0.024		F	#	0.0015	
Oxidation Reduction Potential	mV	07/27/2010	N001	6.3	-	11.3	-12		F	#		
pH	s.u.	07/27/2010	N001	6.3	-	11.3	7.09		F	#		
Specific Conductance	umhos /cm	07/27/2010	N001	6.3	-	11.3	1727		F	#		
Temperature	C	07/27/2010	N001	6.3	-	11.3	16.43		F	#		
Total Dissolved Solids	mg/L	07/27/2010	N001	6.3	-	11.3	1300		F	#	40	
Turbidity	NTU	07/27/2010	N001	6.3	-	11.3	4.45		F	#		
Uranium	mg/L	07/27/2010	N001	6.3	-	11.3	0.34		F	#	0.00029	
Vanadium	mg/L	07/27/2010	N001	6.3	-	11.3	2.1		F	#	0.0015	

Groundwater Quality Data by Location (USEE100) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 9/30/2010
Location: NAT26 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	07/27/2010	N001	10.67	-	15.67	442		F	#		
Arsenic	mg/L	07/27/2010	N001	10.67	-	15.67	0.00036		F	#	0.000015	
Oxidation Reduction Potential	mV	07/27/2010	N001	10.67	-	15.67	62.4		F	#		
pH	s.u.	07/27/2010	N001	10.67	-	15.67	7.15		F	#		
Specific Conductance	umhos /cm	07/27/2010	N001	10.67	-	15.67	3541		F	#		
Temperature	C	07/27/2010	N001	10.67	-	15.67	15.59		F	#		
Total Dissolved Solids	mg/L	07/27/2010	N001	10.67	-	15.67	2600		F	#	40	
Turbidity	NTU	07/27/2010	N001	10.67	-	15.67	2.79		F	#		
Uranium	mg/L	07/27/2010	N001	10.67	-	15.67	1.2		F	#	0.00015	
Vanadium	mg/L	07/27/2010	N001	10.67	-	15.67	0.00063		JF	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE NAT14, Naturita Disposal Site
REPORT DATE: 9/30/2010
Location: BR95-1 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Lab Qualifiers	Data Qualifiers	QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	07/28/2010	N001	221	-	241	410		FQ	#		
Arsenic	mg/L	07/28/2010	N001	221	-	241	0.00049		FQ	#	0.000015	
Molybdenum	mg/L	07/28/2010	N001	221	-	241	0.0071		FQ	#	0.00016	
Oxidation Reduction Potential	mV	07/28/2010	N001	221	-	241	44.9		FQ	#		
pH	s.u.	07/28/2010	N001	221	-	241	7.37		FQ	#		
Specific Conductance	umhos /cm	07/28/2010	N001	221	-	241	1012		FQ	#		
Temperature	C	07/28/2010	N001	221	-	241	22.4		FQ	#		
Total Dissolved Solids	mg/L	07/28/2010	N001	221	-	241	620		FQ	#	20	
Turbidity	NTU	07/28/2010	N001	221	-	241	4.64		FQ	#		
Uranium	mg/L	07/28/2010	N001	221	-	241	0.11		FQ	#	0.000015	
Vanadium	mg/L	07/28/2010	N001	221	-	241	0.00013		UFQ	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE NAT14, Naturita Disposal Site
REPORT DATE: 9/30/2010
Location: BR95-2 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	07/28/2010	N001	163	-	183	558		F	#		
Arsenic	mg/L	07/28/2010	N001	163	-	183	0.00039		F	#	0.00003	
Arsenic	mg/L	07/28/2010	N002	163	-	183	0.00043		F	#	0.00003	
Molybdenum	mg/L	07/28/2010	N001	163	-	183	0.0022		F	#	0.000064	
Molybdenum	mg/L	07/28/2010	N002	163	-	183	0.0023		F	#	0.000064	
Oxidation Reduction Potential	mV	07/28/2010	N001	163	-	183	6.4		F	#		
pH	s.u.	07/28/2010	N001	163	-	183	7.07		F	#		
Specific Conductance	umhos /cm	07/28/2010	N001	163	-	183	1142		F	#		
Temperature	C	07/28/2010	N001	163	-	183	16.9		F	#		
Total Dissolved Solids	mg/L	07/28/2010	N001	163	-	183	650		F	#	20	
Total Dissolved Solids	mg/L	07/28/2010	N002	163	-	183	660		F	#	20	
Turbidity	NTU	07/28/2010	N001	163	-	183	0.65		F	#		
Uranium	mg/L	07/28/2010	N001	163	-	183	0.048		F	#	0.0000058	
Uranium	mg/L	07/28/2010	N002	163	-	183	0.051		F	#	0.0000058	
Vanadium	mg/L	07/28/2010	N001	163	-	183	0.0039		F	#	0.00003	
Vanadium	mg/L	07/28/2010	N002	163	-	183	0.0042	E	F	#	0.00003	

Groundwater Quality Data by Location (USEE100) FOR SITE NAT14, Naturita Disposal Site
REPORT DATE: 9/30/2010
Location: BR95-3 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	07/28/2010	N001	194	-	214	491		F	#		
Arsenic	mg/L	07/28/2010	N001	194	-	214	0.00094		F	#	0.000015	
Molybdenum	mg/L	07/28/2010	N001	194	-	214	0.012		F	#	0.000064	
Oxidation Reduction Potential	mV	07/28/2010	N001	194	-	214	-6.4		F	#		
pH	s.u.	07/28/2010	N001	194	-	214	7.22		F	#		
Specific Conductance	umhos /cm	07/28/2010	N001	194	-	214	1267		F	#		
Temperature	C	07/28/2010	N001	194	-	214	17.43		F	#		
Total Dissolved Solids	mg/L	07/28/2010	N001	194	-	214	790		F	#	20	
Turbidity	NTU	07/28/2010	N001	194	-	214	1.47		F	#		
Uranium	mg/L	07/28/2010	N001	194	-	214	0.032		F	#	0.0000058	
Vanadium	mg/L	07/28/2010	N001	194	-	214	0.00037		UF	#	0.000015	

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.		

QA QUALIFIER:

#	Validated according to quality assurance guidelines.

This page intentionally left blank

Surface Water Quality Data

This page intentionally left blank

Surface Water Quality Data by Location (USEE102) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 9/30/2010
Location: 0531 SURFACE LOCATION SURFACE WATER LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	07/27/2010	N001	195			#		
Arsenic	mg/L	07/27/2010	N001	0.0017			#	0.000015	
Oxidation Reduction Potential	mV	07/27/2010	N001	14.2			#		
pH	s.u.	07/27/2010	N001	8.47			#		
Specific Conductance	umhos/cm	07/27/2010	N001	611			#		
Temperature	C	07/27/2010	N001	24.2			#		
Total Dissolved Solids	mg/L	07/27/2010	N001	420			#	20	
Turbidity	NTU	07/27/2010	N001	8.53			#		
Uranium	mg/L	07/27/2010	N001	0.0016			#	0.0000029	
Vanadium	mg/L	07/27/2010	N001	0.00063		J	#	0.000015	

Surface Water Quality Data by Location (USEE102) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 9/30/2010
Location: 0533 SURFACE LOCATION SURFACE WATER LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	07/27/2010	N001	136			#		
Arsenic	mg/L	07/27/2010	N001	0.0017			#	0.000015	
Oxidation Reduction Potential	mV	07/27/2010	N001	-24.9			#		
pH	s.u.	07/27/2010	N001	8.51			#		
Specific Conductance	umhos/cm	07/27/2010	N001	779			#		
Temperature	C	07/27/2010	N001	27.64			#		
Total Dissolved Solids	mg/L	07/27/2010	N001	570			#	20	
Turbidity	NTU	07/27/2010	N001	5.31			#		
Uranium	mg/L	07/27/2010	N001	0.0025			#	0.0000029	
Vanadium	mg/L	07/27/2010	N001	0.00097		J	#	0.000015	

Surface Water Quality Data by Location (USEE102) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 9/30/2010
Location: SM2 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	07/27/2010	N001	168			#		
Arsenic	mg/L	07/27/2010	N001	0.0019			#	0.000015	
Oxidation Reduction Potential	mV	07/27/2010	N001	-15.7			#		
pH	s.u.	07/27/2010	N001	8.54			#		
Specific Conductance	umhos/cm	07/27/2010	N001	732			#		
Temperature	C	07/27/2010	N001	27.17			#		
Total Dissolved Solids	mg/L	07/27/2010	N001	520			#	20	
Turbidity	NTU	07/27/2010	N001	9.55			#		
Uranium	mg/L	07/27/2010	N001	0.0022			#	0.0000029	
Vanadium	mg/L	07/27/2010	N001	0.00086		J	#	0.000015	

Surface Water Quality Data by Location (USEE102) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 9/30/2010
Location: SM4 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	07/27/2010	N001	151			#		
Arsenic	mg/L	07/27/2010	N001	0.0018			#	0.000015	
Oxidation Reduction Potential	mV	07/27/2010	N001	-27			#		
pH	s.u.	07/27/2010	N001	8.51			#		
Specific Conductance	umhos/cm	07/27/2010	N001	790			#		
Temperature	C	07/27/2010	N001	29.16			#		
Total Dissolved Solids	mg/L	07/27/2010	N001	580			#	20	
Turbidity	NTU	07/27/2010	N001	7.58			#		
Uranium	mg/L	07/27/2010	N001	0.0026			#	0.0000029	
Vanadium	mg/L	07/27/2010	N001	0.0009		J	#	0.000015	

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.		

QA QUALIFIER:

#	Validated according to quality assurance guidelines.

This page intentionally left blank

Equipment Blank Data

This page intentionally left blank

BLANKS REPORT
LAB: PARAGON/ALS LABORATORY GROUP (Fort Collins, CO)
RIN: 10073227
Report Date: 9/30/2010

Parameter	Site Code	Location ID	Sample Date	ID	Units	Result	Qualifiers Lab	Qualifiers Data	Detection Limit	Uncertainty	Sample Type
Arsenic	NAT01	0999	07/27/2010	N001	mg/L	0.000015	U		0.000015		E
Total Dissolved Solids	NAT01	0999	07/27/2010	N001	mg/L	20	U		20		E
Uranium	NAT01	0999	07/27/2010	N001	mg/L	0.000009	B		0.0000029		E
Vanadium	NAT01	0999	07/27/2010	N001	mg/L	0.000015	U		0.000015		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.

This page intentionally left blank

SAMPLE MANAGEMENT SYSTEM

Validation Report: Equipment/Trip Blanks

RIN: 10073227 **Lab Code:** PAR **Project:** Naturita **Validation Date:** 9/29/2010

Blank Data

Blank Type	Lab Sample ID	Lab Method	Analyte Name	Result	Qualifier	MDL	Units
Equipment Blank	1007354-7	SW6020	Uranium	0.009	B	0.0029	UG/L

Sample ID	Sample Ticket	Location	Result	Dilution Factor	Lab Qualifier	Validation Qualifier
1007354-1	IIZ 760	0531	1.6	1		
1007354-18	IIZ 763	SM2	2.2	1		
1007354-19	IIZ 764	SM4	2.6	1		
1007354-2	IIZ 761	0533	2.5	1		

This page intentionally left blank

Static Water Level Data

This page intentionally left blank

STATIC WATER LEVELS (USEE700) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 9/30/2010

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
0715			07/28/2010	08:30:48	4.85	NA	E
0718			07/27/2010	12:15:22	11.76	NA	E
DM1		5310.81	07/28/2010	07:50:45	8.26	5302.55	
MAU07		5280.88	07/27/2010	16:05:59	8.28	5272.6	
MAU08		5291.19	07/27/2010	15:45:20	11.77	5279.42	
NAT01-1		5295.46	07/27/2010	13:35:14	12.22	5283.24	
NAT02		5294.09	07/27/2010	14:55:34	7.56	5286.53	
NAT08		5292.73	07/27/2010	14:15:31	7.98	5284.75	
NAT26		5300.21	07/27/2010	13:10:38	17.38	5282.83	

STATIC WATER LEVELS (USEE700) FOR SITE NAT14, Naturita Disposal Site
REPORT DATE: 9/30/2010

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
BR95-1	O		07/28/2010	12:00:36	210.67	NA	E
BR95-2	O		07/28/2010	13:35:40	172.85	NA	E
BR95-3	O		07/28/2010	14:55:55	210.97	NA	E

FLOW CODES: O ONSITE

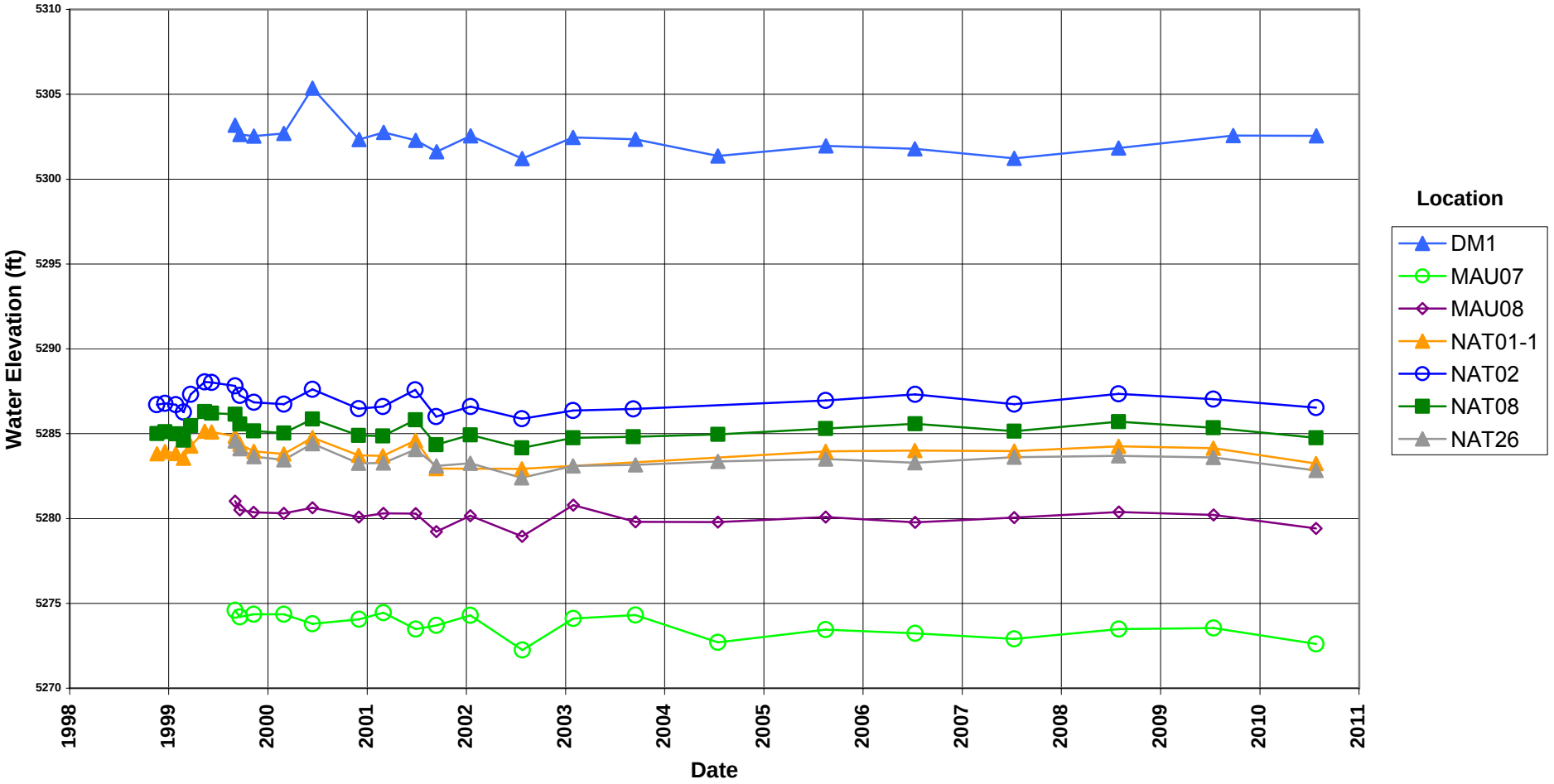
WATER LEVEL FLAGS: E TOP OF CASING ELEVATION DATA NOT AVAILABLE

This page intentionally left blank

Hydrographs

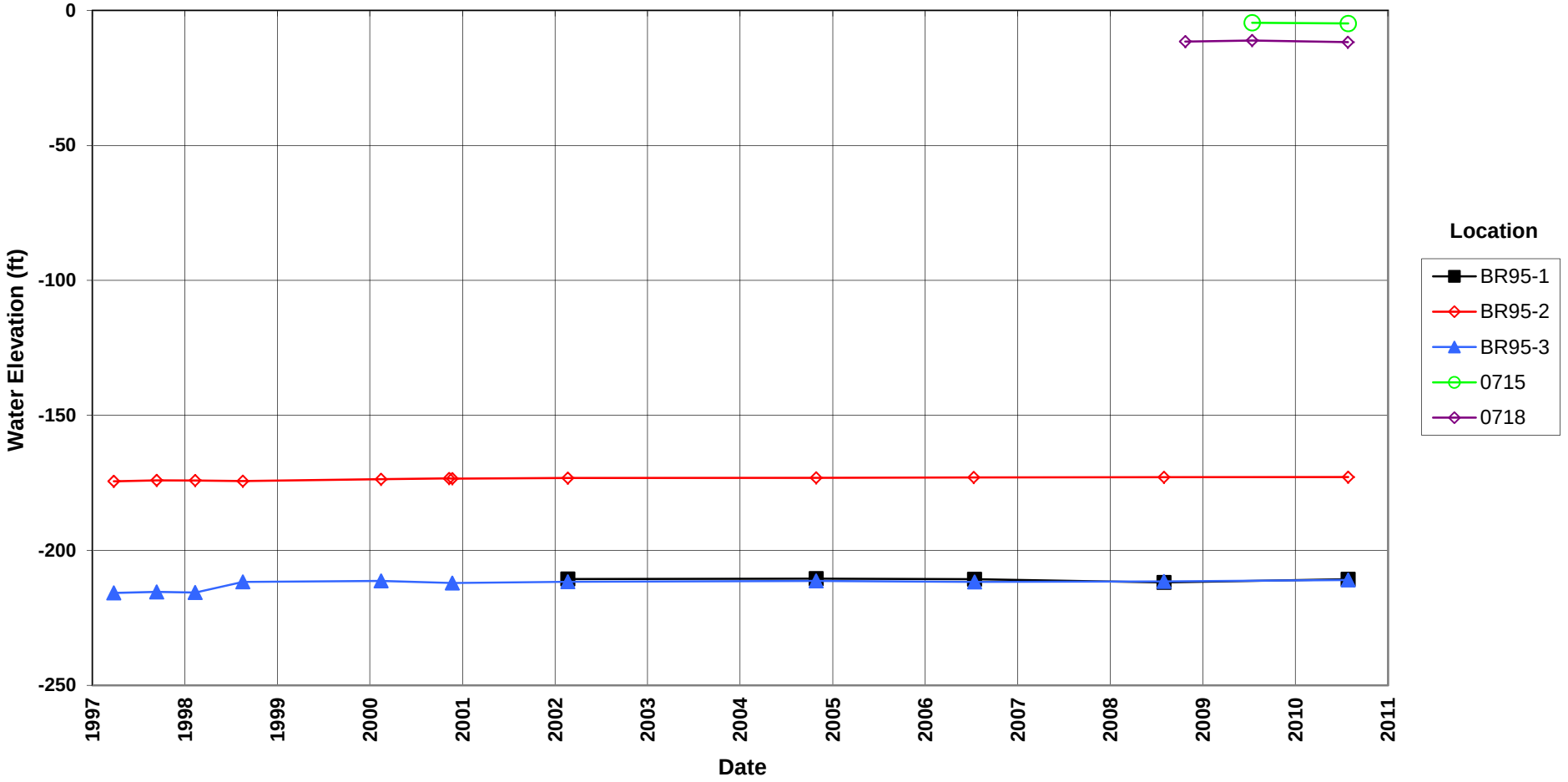
This page intentionally left blank

Naturita Processing Site
Hydrograph



-

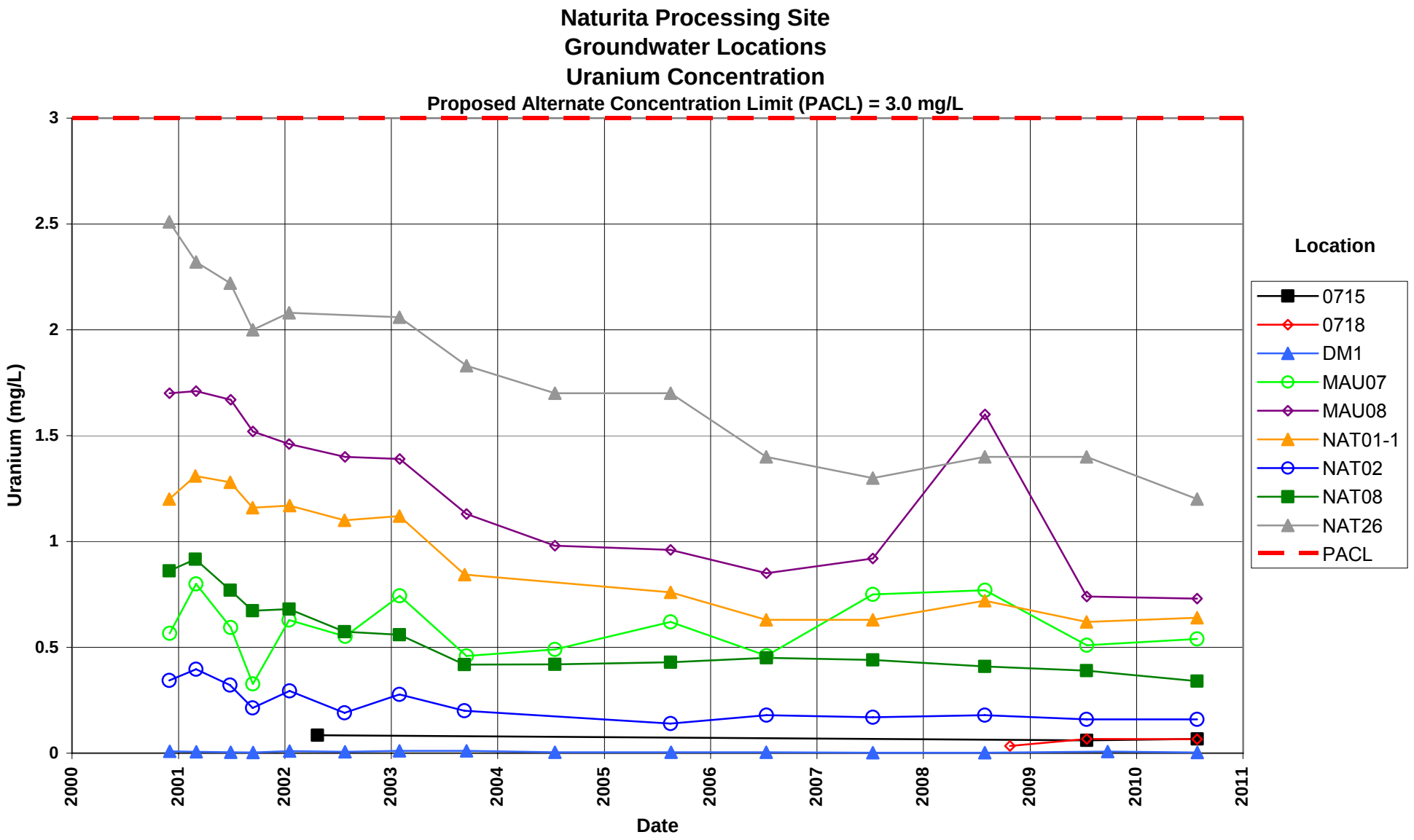
Naturita
Hydrograph
LOCATIONS WHERE TOP OF CASING ELEVATION DATA ARE NOT AVAILABLE

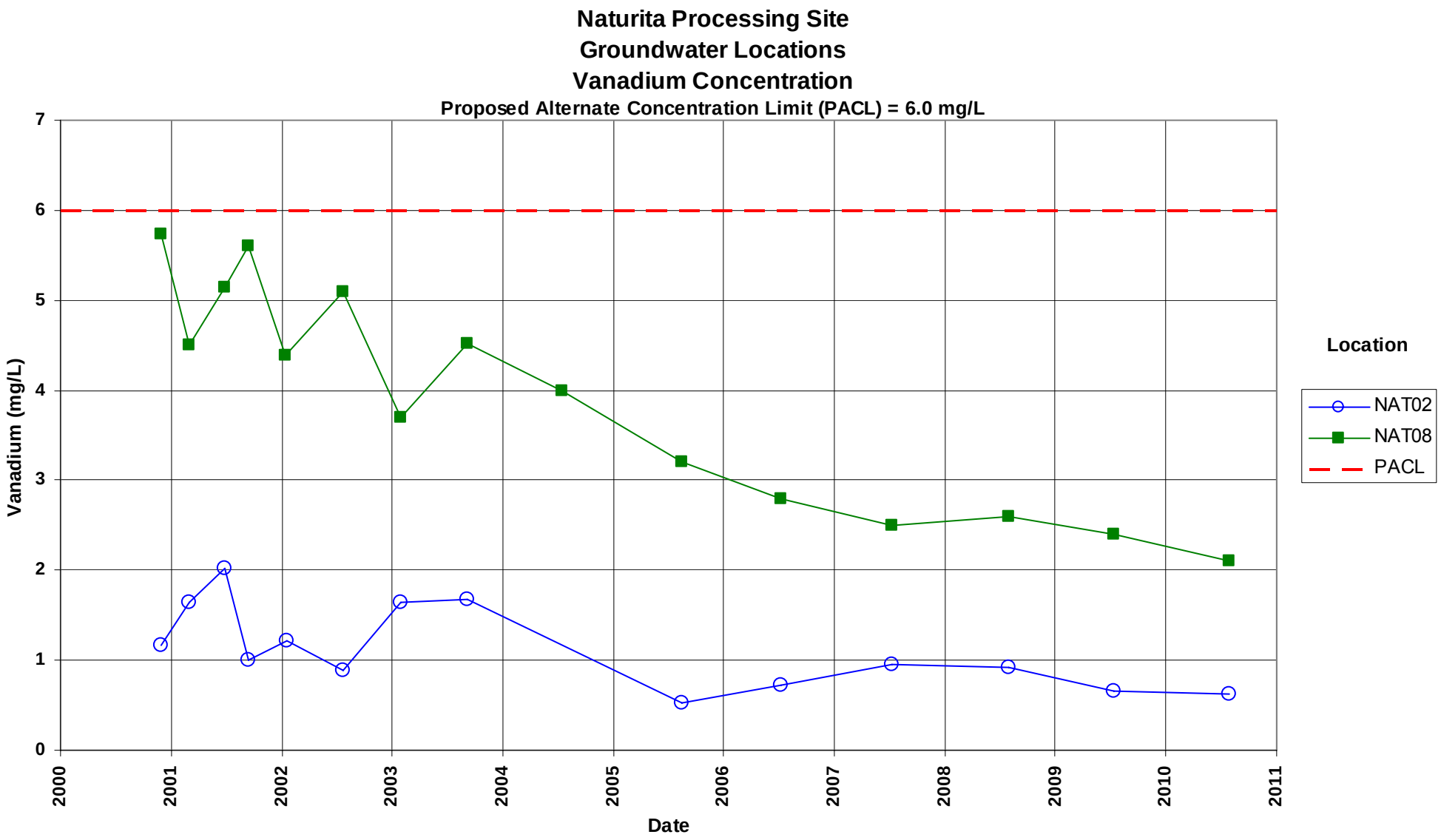


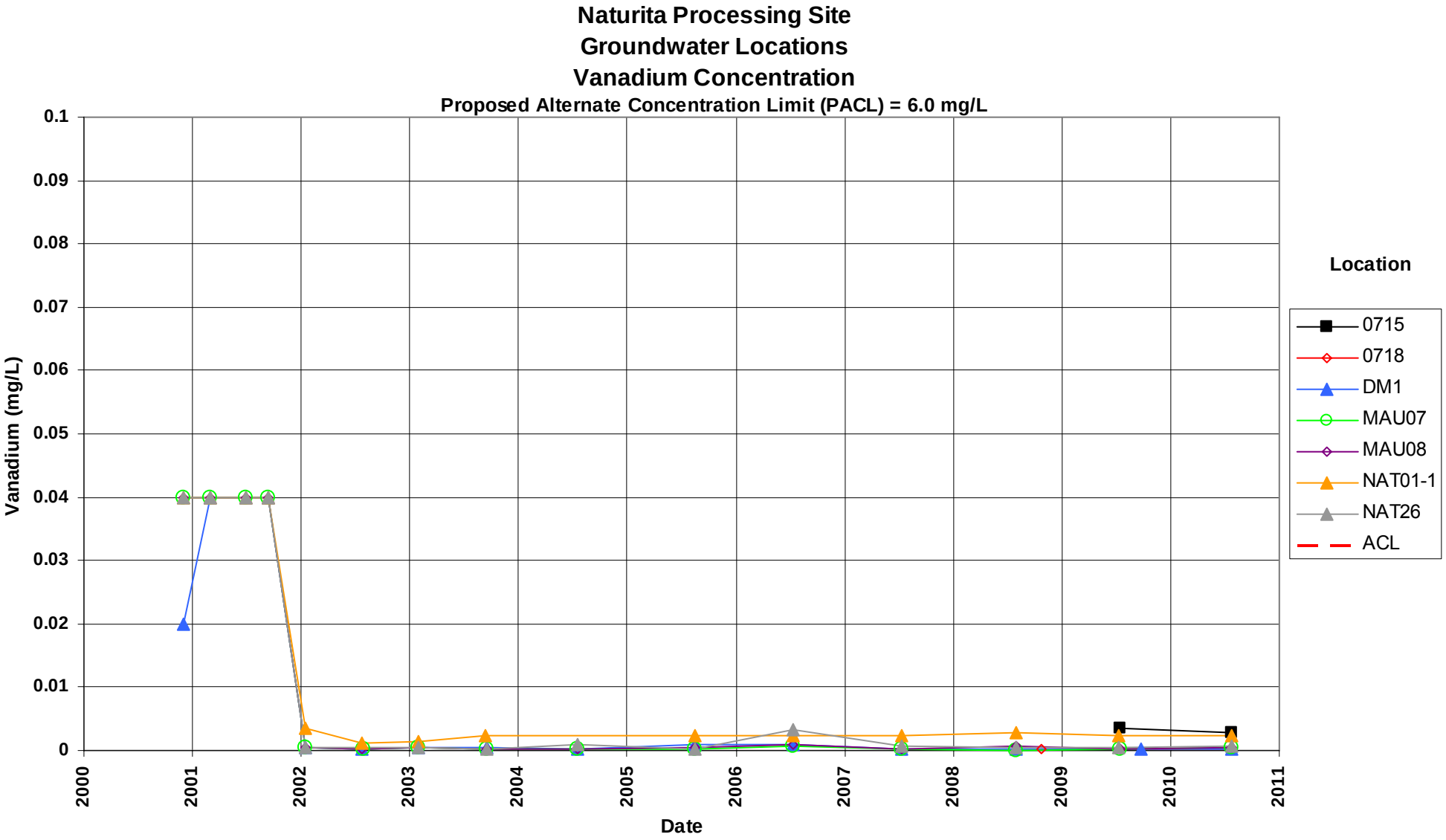
-

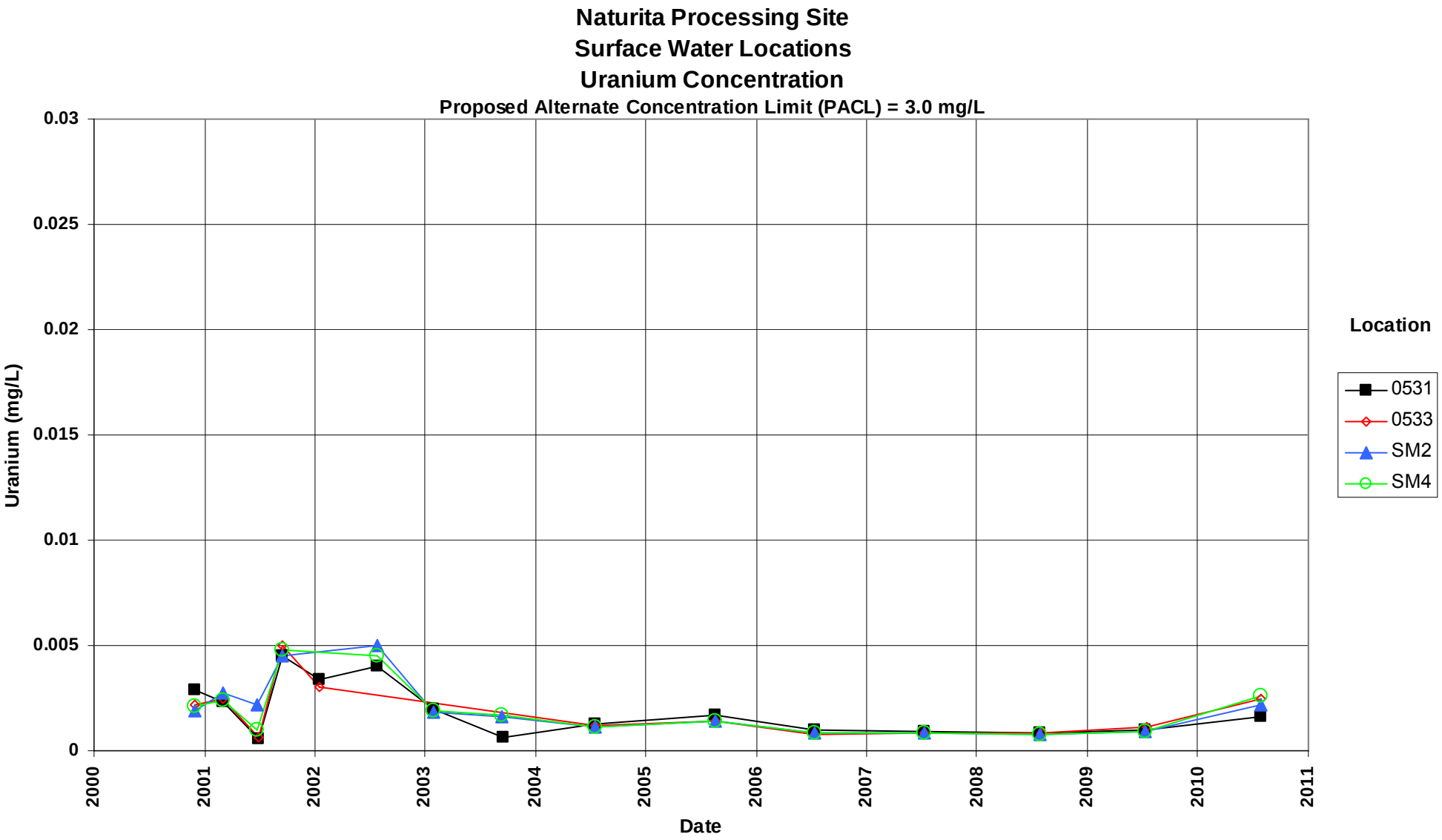
Processing Site
Time-Concentration Graphs

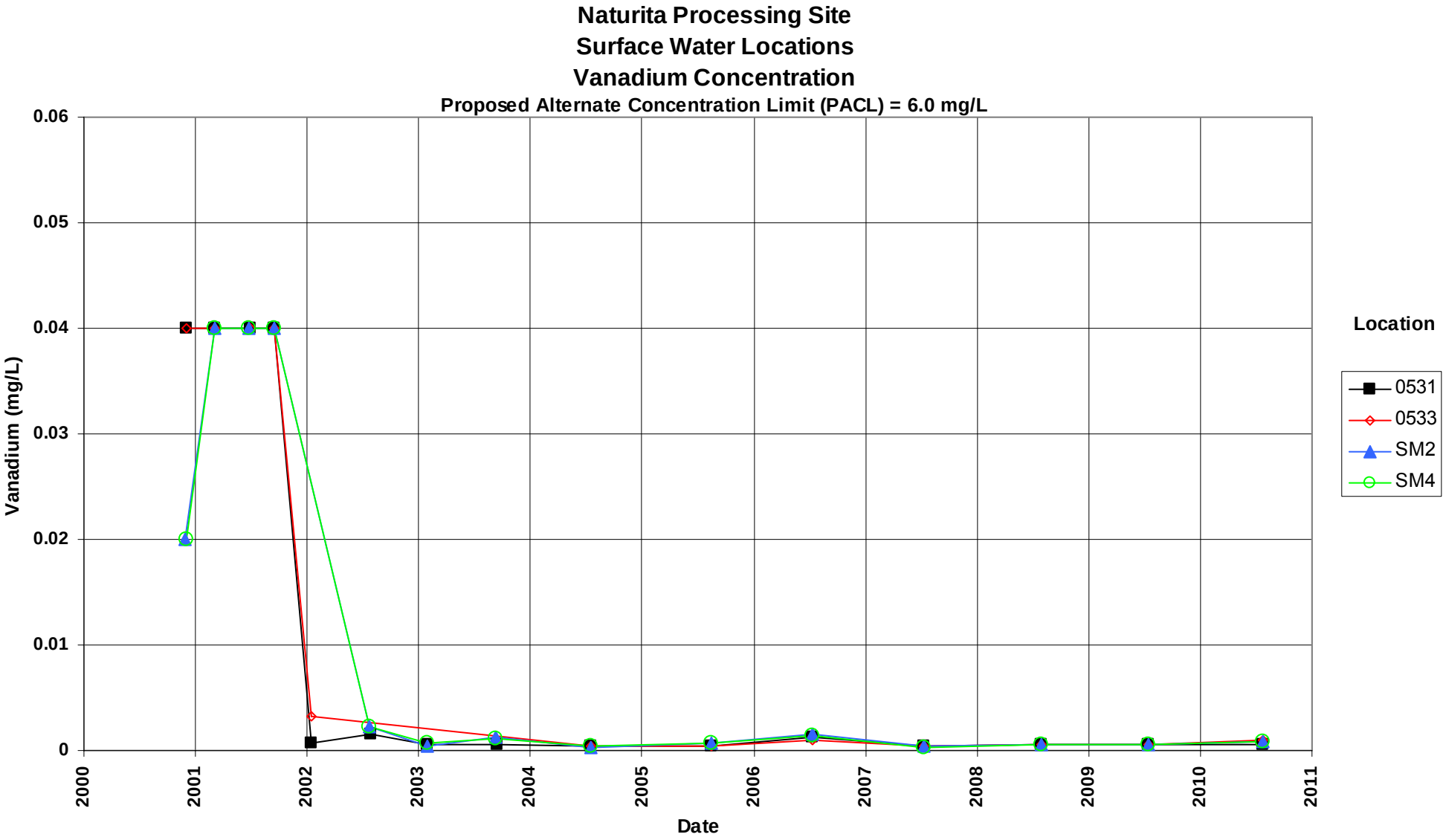
This page intentionally left blank


Naturita Processing Site
Groundwater Locations
Uranium Concentration
Proposed Alternate Concentration Limit (PACL) = 3.0 mg/L
Uranium (mg/L)
3
2.5
2
1.5
1
0.5
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Date
Location
0715
0718
DM1
MAU07
MAU08
NAT01-1
NAT02
NAT08
NAT26
PACL


Naturita Processing Site
Groundwater Locations
Vanadium Concentration
Proposed Alternate Concentration Limit (PACL) = 6.0 mg/L
Vanadium (mg/L)
0
1
2
3
4
5
6
7
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Date
Location
NAT02
NAT08
PACL


Naturita Processing Site
Groundwater Locations
Vanadium Concentration
Proposed Alternate Concentration Limit (PACL) = 6.0 mg/L
Vanadium (mg/L)
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Date
Location
0715
0718
DM1
MAU07
MAU08
NAT01-1
NAT26
ACL

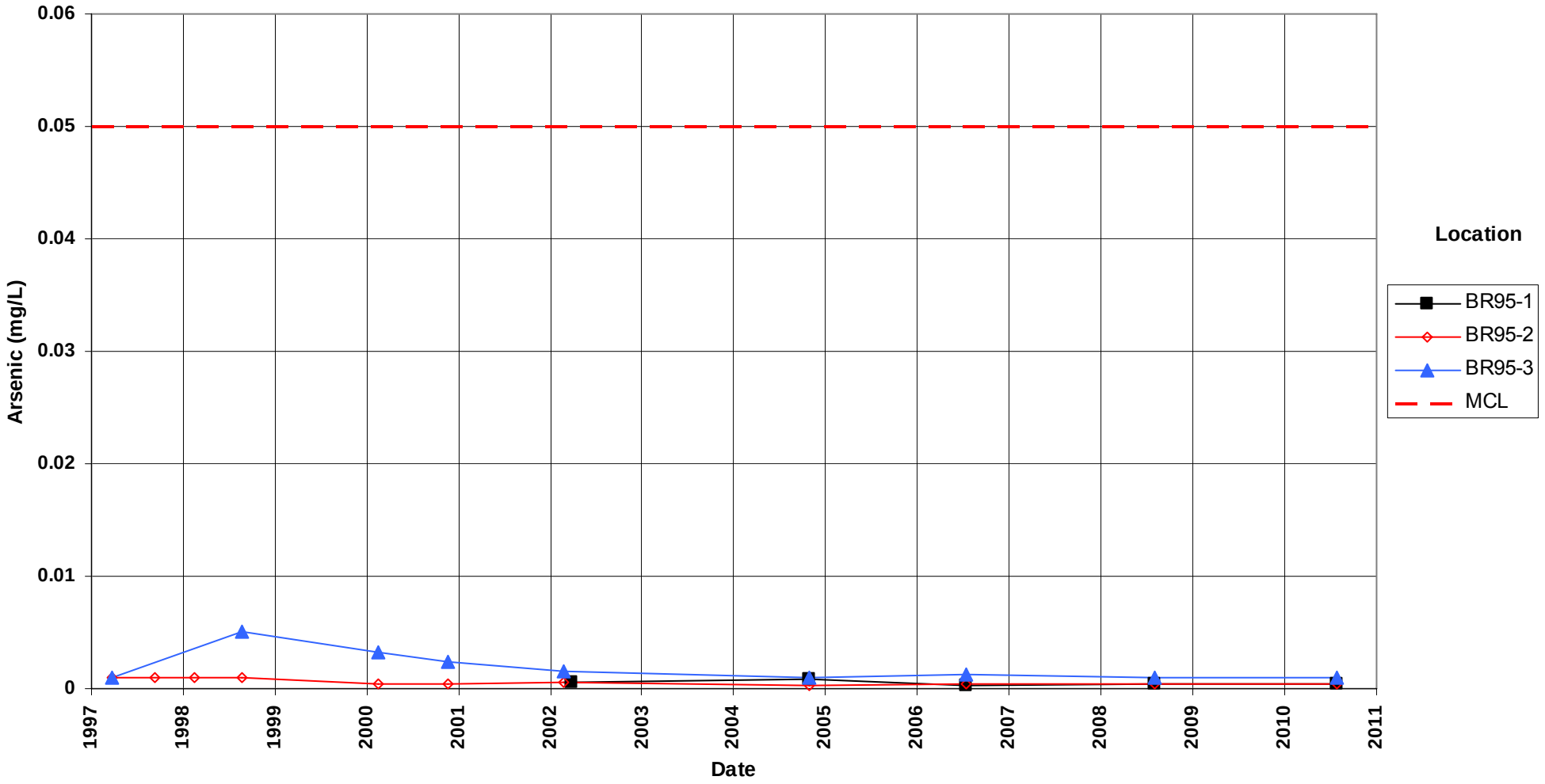

Naturita Processing Site
Surface Water Locations
Uranium Concentration
Proposed Alternate Concentration Limit (PACL) = 3.0 mg/L
Uranium (mg/L)
0.03
0.025
0.02
0.015
0.01
0.005
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Date
Location
0531
0533
SM2
SM4

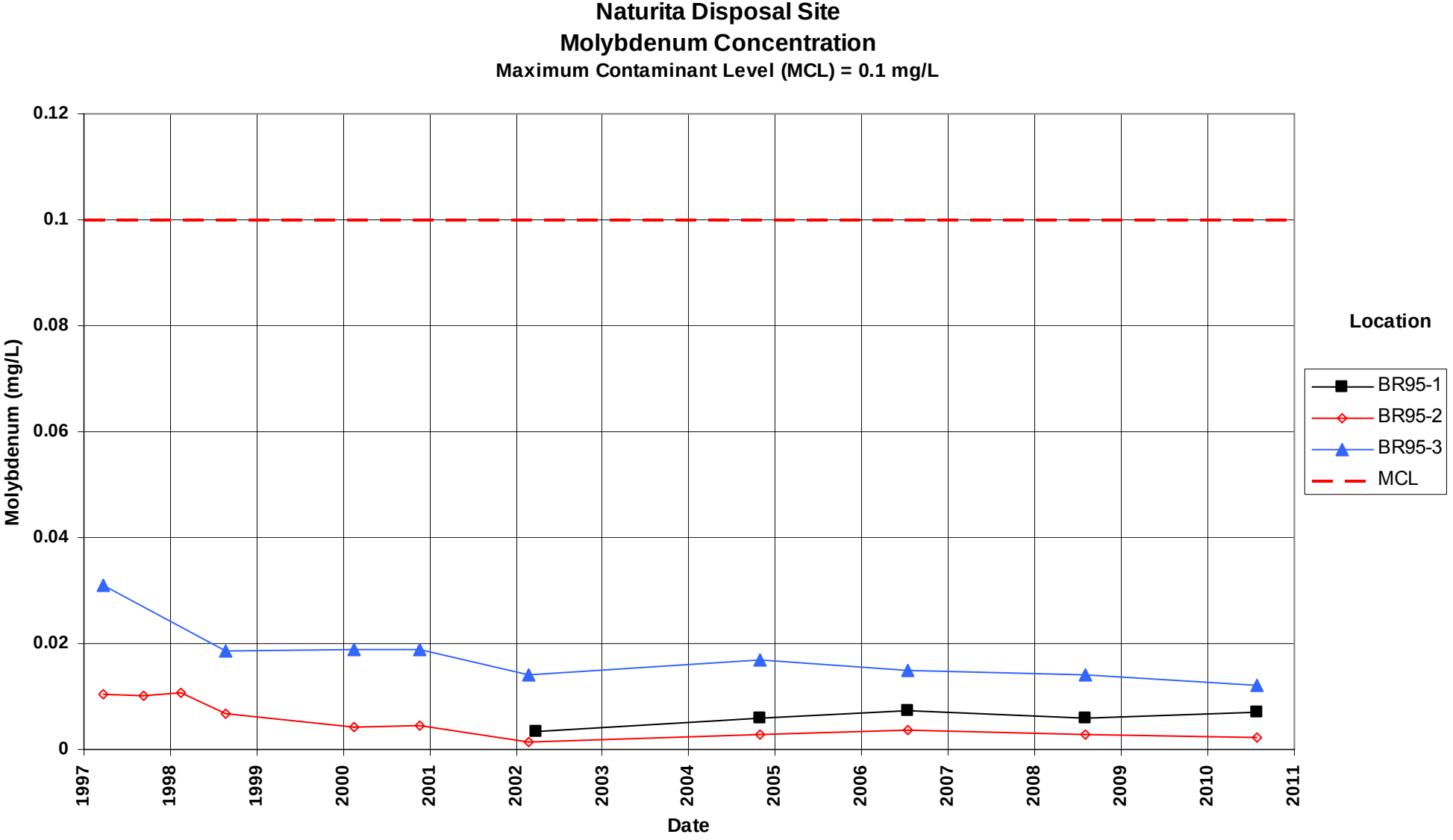

Naturita Processing Site
Surface Water Locations
Vanadium Concentration
Proposed Alternate Concentration Limit (PACL) = 6.0 mg/L
Vanadium (mg/L)
0.06
0.05
0.04
0.03
0.02
0.01
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Date
Location
0531
0533
SM2
SM4

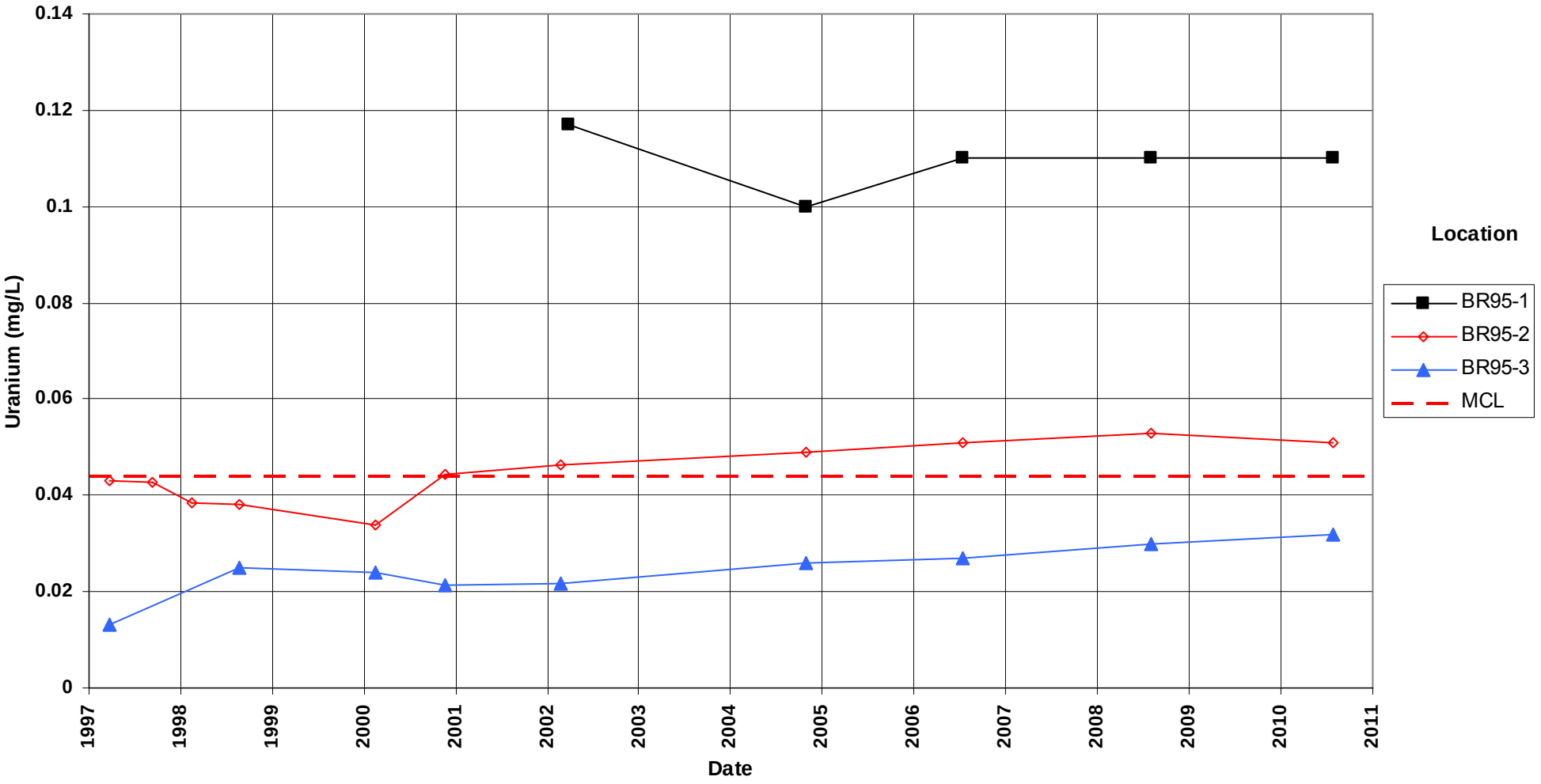
This page intentionally left blank

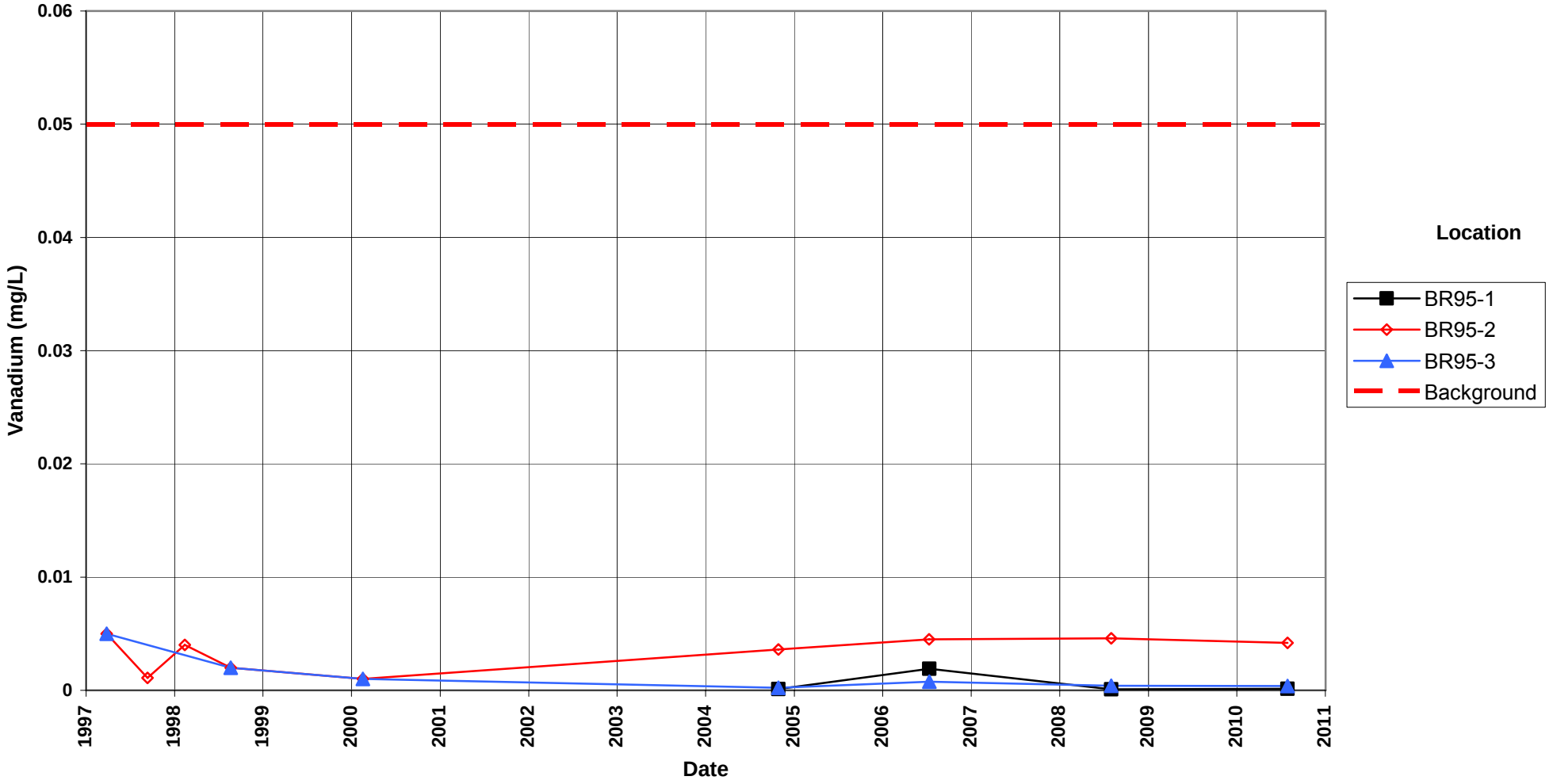
Disposal Site
Time-Concentration Graphs

This page intentionally left blank


Naturita Disposal Site
Arsenic Concentration
Maximum Contaminant Level (MCL) = 0.05 mg/L
Arsenic (mg/L)
0.06
0.05
0.04
0.03
0.02
0.01
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Date
Location
BR95-1
BR95-2
BR95-3
MCL


Naturita Disposal Site
Molybdenum Concentration
Maximum Contaminant Level (MCL) = 0.1 mg/L
Molybdenum (mg/L)
0.12
0.1
0.08
0.06
0.04
0.02
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Date
Location
BR95-1
BR95-2
BR95-3
MCL


Naturita Disposal Site
Uranium Concentration
Maximum Contaminant Level (MCL) = 0.044 mg/L
Uranium (mg/L)
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Date
Location
BR95-1
BR95-2
BR95-3
MCL


Naturita Disposal Site
Vanadium Concentration
Background = 0.05 mg/L from Table 2.2 of the 1999 LTSP
Vanadium (mg/L)
0.06
0.05
0.04
0.03
0.02
0.01
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Date
Location
BR95-1
BR95-2
BR95-3
Background

Attachment 3
Sampling and Analysis Work Order

This page intentionally left blank

Stoller

established 1959

Task Order LM00-501
Control Number 10-0746

July 1, 2010

U.S. Department of Energy
Office of Legacy Management
ATTN: Mark Kautsky
Site Manager
2597 B ¾ Road
Grand Junction, CO 81503

SUBJECT: Contract No. DE-AM01-07LM00060, S.M. Stoller Corporation (Stoller)
July 2010 Environmental Sampling at Naturita, Colorado - Revised

REFERENCE: Task Order LM00-501-02-115-402, Naturita, CO, Processing and Disposal Sites

Dear Mr. Kautsky:

The purpose of this letter is to inform you of the upcoming sampling event at Naturita, Colorado. Enclosed are the maps and tables specifying sample locations and analytes for monitoring at the Naturita processing and disposal sites. Water quality data will be collected from monitoring wells and surface locations at this site as part of the routine environmental sampling currently scheduled to begin the week of July 26, 2010. This letter has been revised to change the zone of completion on some of the wells.

The following lists show the monitoring wells (with zone of completion) and surface locations scheduled to be sampled during this event.

Monitoring Wells*

Processing Site

NAT01-1 Al	NAT 02 Al	NAT08 Al	NAT26 Al	718 Al
MAU07 Al	MAU08 Al	DM1 Al	715 Al	

Disposal Site

BR95-1 Ju/Jv	BR95-2 Ju/Jv	BR95-3 Ju/Jv	CM93-1 Wg	CM93-2 Wg

*NOTE: Al = Alluvium; Ju/Jv = Jurassic Morrison/Summerville; Wg = Wingate Sandstone

Surface Locations (filtered)

0531	0533	SM2	SM4

The S.M. Stoller Corporation 2597 B ¾ Road Grand Junction, CO 81503 (970) 248-6000 Fax: (970) 248-6040

All samples will be collected as directed in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites*. Access agreements are being reviewed and are expected to be complete by the beginning of fieldwork.

Please contact me at (970) 248-6557 if you have any questions or concerns.

Sincerely,

David Traub

David Traub
Site Lead

DT/lcg/lb

Enclosures (4)

cc: (electronic)
Cheri Bahrke, Stoller
Steve Donivan, Stoller
Bev Gallagher, Stoller
Lauren Goodknight, Stoller
David Traub, Stoller
EDD Delivery
rc-grand.junction

Constituent Sampling Breakdown

Site	Naturita				
Analyte	Groundwater	Surface Water	Required Detection Limit (mg/L)	Analytical Method	Line Item Code
Approx. No. Samples/yr	14	5			
Field Measurements					
Alkalinity	X	X			
Dissolved Oxygen					
Redox Potential	X	X			
pH	X	X			
Specific Conductance	X	X			
Turbidity	X				
Temperature	X	X			
Laboratory Measurements					
Aluminum					
Ammonia as N (NH3-N)					
Arsenic	X	X	0.0001	SW-846 6020	LMM-02
Calcium					
Chloride					
Chromium					
Gross Alpha					
Gross Beta					
Iron					
Lead					
Magnesium					
Manganese					
Molybdenum	BR and CM wells only		0.003	SW-846 6020	LMM-02
Nickel					
Nickel-63					
Nitrate + Nitrite as N (NO3+NO2)-N					
Potassium					
Radium-226					
Radium-228					
Selenium					
Silica					
Sodium					
Strontium					
Sulfate					
Sulfide					
Total Dissolved Solids	X	X	10	SM2540 C	WCH-A-033
Total Organic Carbon					
Uranium	X	X	0.0001	SW-846 6020	LMM-02
Vanadium	X	X	0.0003	SW-846 6020	LMM-02
Zinc					
Total No. of Analytes	5	4			

Note: All analyte samples are considered unfiltered unless stated otherwise. All private well samples are to be unfiltered. The total number of analytes does not include field parameters.

This page intentionally left blank

Attachment 4
Trip Report

This page intentionally left blank

Stoller
Grand Junction Office
established 1959

Memorandum

DATE: August 2, 2010

TO: David Traub

FROM: Gretchen Baer

SUBJECT: Sampling Trip Report

Site: Naturita, CO, Processing and Disposal Sites

Dates of Sampling Event: July 27-28, 2010

Team Members: Gretchen Baer and Kent Moe

Number of Locations Sampled:

Processing Site–9 monitoring wells and 4 surface water locations.
Disposal Site–3 monitoring wells.

Locations Not Sampled/Reason: Disposal site wells CM93–1 and CM93–2 could not be sampled by bailing as planned because pumps are installed in the wells. Equipment needed to remove or operate these pumps was not available.

Location Specific Information:

Location IDs	Comments
BR95–1	Site lead observed sampling. Poor pump performance; site lead directed that samples be taken before minimum volume was purged. Cat III purge criteria used. Data validation: All field and laboratory results should be flagged for sampling technique.
BR95–1, BR95–2, BR95–3, CM93–1, CM93–2	Riveted new well labels to the casing lids.
CM93-1, CM93-2	Old pumps are installed in these wells. Photo of CM93–2 is included in this report.
NAT01–1	Small casing: could not take WL measurements during purge. Established Cat I.
0715	Called landowners 7/27/10 afternoon to tell them we would be sampling 7/28/10 morning. Small casing: could not take WL measurements during purge. Established Cat I.
0718	First 2 L of purge had orange organics.

Quality Control Sample Cross Reference: The following are the false identifications assigned to the quality control samples:

False ID	True ID	Ticket Number	Sample Type	Associated Matrix
2516	BR95–2	IIZ 765	Duplicate	Groundwater
2517	NAT01–1	IIZ 766	Duplicate	Groundwater
2986	Associated with 0531, 0533, SM2, and SM4	IIR 810	Equipment Blank	Water

RIN Number Assigned: Samples were assigned to RIN 10073227.

Sample Shipment: Samples were shipped from Grand Junction to ALS Laboratory Group on July 29, 2010.

Well Inspection Summary: All wells were in acceptable condition. There is no outer casing or cover for 0715. Pumps that are in place in CM93–1 and CM93–2 prevented sampling by bailer. Photos of the vegetation around MAU07 and of well CM93–2 were taken and are available on the Gull server's "Sites" directory.

Photo of well CM93–2 taken on July 28, 2010.

Equipment: Wells were sampled with a peristaltic pump and dedicated tubing (Processing Site) or a dedicated bladder pump (Disposal Site). Surface waters were sampled using a peristaltic pump and tubing reel. An equipment blank was collected after decontamination of the tubing reel. All other equipment was dedicated or disposable.

Water Level Measurements: Water levels were measured in all sampled wells.

Field Variance: At BR95–1 the site lead directed that samples be taken before the minimum volume was purged because of poor pump performance. All field and laboratory results should be flagged as qualitative due to sampling technique.

Institutional Controls:

Fences, Gates, and Locks: All gates were locked and in good condition.
Signs: Acceptable.
Trespassing/Site Disturbances: N/A

Site Issues: Cell phone service was not available at the Disposal Site or most areas of the Processing Site.

Disposal Cell/Drainage Structure Integrity: Appeared to be acceptable.
Vegetation/Noxious Weed Concerns: None.
Maintenance Requirements: None.
Safety Issues: None.
Access:

- Called landowner at 970-864-7913 before driving to well 0715.
- Well BR95–1 is at the bottom of a very steep slope with poor footing. Recommend accessing this well on ATVs from the bottom of the cell.

Corrective Action Required/Taken: None.

(GB/lcg)

cc: (electronic)
Mark Kautsky, DOE
Cheri Bahrke, Stoller
Steve Donivan, Stoller
EDD Delivery

This page intentionally left blank