Data Validation Package

July 2011
Groundwater and Surface Water Sampling at the Naturita, Colorado, Processing Site

November 2011

U.S. DEPARTMENT OF ENERGY | Legacy Management

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Sampling Event Summary

Site: Naturita, Colorado, Processing Site

Sampling Period: July 26, 2011

This event includes sampling groundwater and surface water at the Naturita Processing 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). Duplicate samples were collected from location 0718. 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 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 2011 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	0.00480	0.00071	0.00062	0.00068	0.00070
Vanadium	0.00500	0.00054	0.00057	0.00062	0.00056

David Traub
Site Lead, S.M. Stoller Corporation

11-4-11
Date

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Naturita, Colorado, Processing Site Sample Location Map

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Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	Naturita, CO	**Date(s) of Water Sampling**	July 26, 2011
Date(s) of Verification	September 29, 2011	**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 June 6, 2011.
2. Were the sampling locations specified in the planning documents sampled?	Yes	
3. Was a pre-trip calibration conducted as specified in the above-named documents?	Yes	Pre-trip calibration was performed on July 26, 2011.
4. Was an operational check of the field equipment conducted daily?	Yes	
Did the operational checks meet criteria?	Yes	
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?	Yes	
Did the water level stabilize prior to sampling?	Yes	
Did pH, specific conductance, and turbidity measurements stabilize prior to sampling?	Yes	
Was the flow rate less than 500 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	
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 0718.
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 2517 and 2986 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):	11073963
Sample Event:	July 26, 2011
Site(s):	Naturita, CO, Processing Site
Laboratory:	ALS Laboratory Group, Fort Collins, Colorado
Work Order No.:	1107371
Analysis:	Metals and Wet Chemistry
Validator:	Gretchen Baer
Review Date:	September 29, 2011

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
1107371-1	0531	Vanadium	U	Less than 5 times the calibration blank
1107371-2	0533	Vanadium	U	Less than 5 times the calibration blank
1107371-4	0718	Vanadium	U	Less than 5 times the calibration blank
1107371-5	Equip Blank, 2517	Arsenic	J	Negative calibration blank
1107371-5	Equip Blank, 2517	Vanadium	U	Less than 5 times the calibration blank
1107371-6	0718 Dup, 2986	Vanadium	U	Less than 5 times the calibration blank
1107371-7	DM1	Vanadium	U	Less than 5 times the calibration blank
1107371-8	MAU07	Vanadium	U	Less than 5 times the calibration blank
1107371-9	MAU08	Arsenic	J	Negative calibration blank
1107371-9	MAU08	Vanadium	U	Less than 5 times the calibration blank
1107371-10	NAT01-1	Vanadium	U	Less than 5 times the calibration blank
1107371-13	NAT26	Arsenic	J	Negative calibration blank
1107371-13	NAT26	Vanadium	U	Less than 5 times the calibration blank
1107371-14	SM2	Vanadium	U	Less than 5 times the calibration blank
1107371-15	SM4	Vanadium	U	Less than 5 times the calibration blank

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received 15 water samples on July 28, 2011, 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 0.8 °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 4, 2011, 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 detects were either greater than 3 times the intercept or have been qualified with a “U” flag (not detected), so no further data qualification is necessary. 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, with the exception of a calibration blank (CCB4) for uranium. The samples associated with CCB4 had uranium concentrations greater than 10 times the blank, so no further qualification is required. In cases where a blank concentration exceeds or equals the MDL, the associated sample results are qualified with a "U" flag (not detected) when the dilution-factor-corrected sample result is greater than the MDL but less than 5 times the blank concentration. For arsenic, some calibration blanks were negative and the absolute values were greater than the MDL but less than the PQL. The associated arsenic results less than 5 times the MDL are flagged with a "J" as estimated values.

Matrix Spike Analysis

Matrix spike and matrix spike duplicate samples are used to measure method performance in the sample matrix. 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 5 times 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 an arsenic 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

A revised EDD file arrived on October 11, 2011, in response to Request for Information #11-3308. The revision included minor corrections to some metals results. The data were reloaded into SEEPro on October 17, 2011. 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: 11073963 **Lab Code:** PAR **Validator:** Gretchen Baer **Validation Date:** 9/29/2011

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

# of Samples: 15 **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 was 1 duplicate evaluated.

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 11073963 **Lab Code:** PAR **Date Due:** 8/25/2011

Matrix: Water **Site Code:** NAT **Date Completed:** 8/29/2011

Analyte	Method Type	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	ICP/MS	08/04/2011	-0.0430	1.0000	OK	OK	OK	OK	OK	102.0	106.0	102.0	4.0	109.0		88.0
Uranium	ICP/MS	08/04/2011	-0.0020	1.0000	OK	OK	OK	OK	OK	100.0	113.0	104.0	8.0	104.0	2.0	115.0
Vanadium	ICP/MS	08/04/2011	-0.3000	1.0000	OK	OK	OK	OK	OK	98.0	102.0	102.0	0.0	105.0		90.0

SAMPLE MANAGEMENT SYSTEM

Wet Chemistry Data Validation Worksheet

RIN: 11073963 **Lab Code:** PAR **Date Due:** 8/25/2011

Matrix: Water **Site Code:** NAT **Date Completed:** 8/29/2011

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	08/02/2011							OK	102.00			2.00	

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.

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

Equipment Blank

An equipment blank (field ID 2517) was collected after decontamination of equipment used to collect some samples. There were no target analytes detected in the equipment blank. (Vanadium was detected in the equipment blank by the laboratory but this result was qualified during data validation with a "U" flag as not detected for its presence in the calibration blanks). 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. The relative percent difference for duplicate results that are greater than 5 times the PQL should be less than 20 percent. For results that are less than 5 times the PQL, the range should be no greater than the PQL. A duplicate sample (field ID 2986) was collected from location 0718. The duplicate results met the criteria, demonstrating acceptable overall precision.

SAMPLE MANAGEMENT SYSTEM

Validation Report: Equipment/Trip Blanks

RIN: 11073963 **Lab Code:** PAR **Project:** Naturita **Validation Date:** 9/29/2011

Blank Data

Blank Type	Lab Sample ID	Lab Method	Analyte Name	Result	Qualifier	MDL	Units
Equipment Blank	1107371-5	SW6020	Vanadium	0.096	B	0.015	UG/L

Sample ID	Sample Ticket	Location	Result	Dilution Factor	Lab Qualifier	Validation Qualifier
1107371-14	JIX 118	SM2	0.57	1		
1107371-15	JIX 119	SM4	0.62	1		
1107371-2	JIX 117	0533	0.56	1		
1107371-3	JIX 122	0715	3.4	2		

SAMPLE MANAGEMENT SYSTEM

Validation Report: Field Duplicates

RIN: 11073963 **Lab Code:** PAR **Project:** Naturita **Validation Date:** 9/29/2011

Duplicate: 2986 **Sample:** 0718

Analyte	Sample Result	Flag	Error	Dilution	Duplicate Result	Flag	Error	Dilution	RPD	RER	Units
Arsenic	4			1	3.5			1	13.33		UG/L
TOTAL DISSOLVED SOLIDS	1300			1	1400			1	7.41		MG/L
Uranium	49			1	50			1	2.02		UG/L
Vanadium	0.43			1	0.6			1	33.01		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: _____ 11-2-2011
Steve Donivan Date

Data Validation Lead: _____ 11/2/11
Gretchen Baer Date

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Attachment 1
Assessment of Anomalous Data

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Potential Outliers Report

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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.

One result was identified as potentially anomalous. The uranium result for location MAU07 had a concentration lower than previously observed. The sample was analyzed twice at different dilutions and the results from the two runs were in close agreement. Also, the uranium analysis was performed concurrently with arsenic and vanadium and neither of those results was anomalous. These observations indicate that an analytical error is unlikely.

Potential anomalies in the field parameters were also examined for patterns of repeated high or low bias, which suggest a systematic error due to instrument malfunction. No such patterns were found.

The data for this RIN are acceptable as qualified.

Data Validation Outliers Report - No Field Parameters
Comparison: All Historical Data
Laboratory: ALS Laboratory Group
RIN: 11073963
Report Date: 11/2/2011

					Current			Historical Maximum			Historical Minimum			Number of Data Points		Statistical Outlier
						Qualifiers			Qualifiers			Qualifiers				
Site Code	Location Code	Sample ID	Sample Date	Analyte	Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect	
NAT01	MAU07	N001	07/26/2011	Total Dissolved Solids	1000		F	2300		F	1200		F	14	0	No
NAT01	MAU07	N001	07/26/2011	Uranium	0.19		F	0.906	DI		0.327	DI		20	0	Yes
NAT01	MAU08	N001	07/26/2011	Total Dissolved Solids	1700		F	4300		FQ	2100		F	14	0	No
NAT01	MAU08	N001	07/26/2011	Uranium	0.61		F	1.71	DI		0.73		F	21	0	No
NAT01	NAT01-1	N001	07/26/2011	Total Dissolved Solids	1400		F	1870			1500		F	13	0	No
NAT01	NAT01-1	N001	07/26/2011	Uranium	0.55		F	1.31	DI		0.62		F	22	0	No
NAT01	NAT02	N001	07/26/2011	Uranium	0.13		F	0.638	DI		0.14		F	21	0	No
NAT01	NAT08	N001	07/26/2011	Total Dissolved Solids	1200		F	1620			1250		F	16	0	No
NAT01	NAT08	N001	07/26/2011	Uranium	0.31		F	1.24	DI		0.34		F	24	0	No
NAT01	NAT26	N001	07/26/2011	Uranium	1.1		F	2.51	DI		1.2		F	19	0	No
NAT01	SM2	0001	07/26/2011	Uranium	0.00062			0.005			0.0008			14	0	No
NAT01	SM4	0001	07/26/2011	Uranium	0.00068			0.00476			0.0008			15	0	No

STATISTICAL TESTS:
The distribution of the data is tested for normality or lognormality using the Shapiro-Wilk Test
Outliers are identified using Dixon's Test when there are 25 or fewer data points.
Outliers are identified using Rosner's Test when there are 26 or more data points.
See Data Quality Assessment: Statistical Methods for Practitioners, EPA QC/G-9S, February 2006.

Attachment 2
Data Presentation

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Groundwater Quality Data

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Groundwater Quality Data by Location (USEE100) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 10/18/2011
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 $CaCO_3$)	mg/L	07/26/2011	N001	5.49	-	10.42	237		F	#		
Arsenic	mg/L	07/26/2011	N001	5.49	-	10.42	0.0046		F	#	0.00003	
Oxidation Reduction Potential	mV	07/26/2011	N001	5.49	-	10.42	20.2		F	#		
pH	s.u.	07/26/2011	N001	5.49	-	10.42	7.28		F	#		
Specific Conductance	umhos /cm	07/26/2011	N001	5.49	-	10.42	1245		F	#		
Temperature	C	07/26/2011	N001	5.49	-	10.42	16.4		F	#		
Total Dissolved Solids	mg/L	07/26/2011	N001	5.49	-	10.42	980		F	#	20	
Turbidity	NTU	07/26/2011	N001	5.49	-	10.42	2.84		F	#		
Uranium	mg/L	07/26/2011	N001	5.49	-	10.42	0.11		F	#	0.0000058	
Vanadium	mg/L	07/26/2011	N001	5.49	-	10.42	0.0034		F	#	0.00003	

Groundwater Quality Data by Location (USEE100) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 10/18/2011
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 $CaCO_3$)	mg/L	07/26/2011	N001	8.6	-	18.6	335		F	#		
Arsenic	mg/L	07/26/2011	N001	8.6	-	18.6	0.004		F	#	0.000015	
Arsenic	mg/L	07/26/2011	N002	8.6	-	18.6	0.0035		F	#	0.000015	
Oxidation Reduction Potential	mV	07/26/2011	N001	8.6	-	18.6	129.6		F	#		
pH	s.u.	07/26/2011	N001	8.6	-	18.6	7.01		F	#		
Specific Conductance	umhos /cm	07/26/2011	N001	8.6	-	18.6	1596		F	#		
Temperature	C	07/26/2011	N001	8.6	-	18.6	13.55		F	#		
Total Dissolved Solids	mg/L	07/26/2011	N001	8.6	-	18.6	1300		F	#	40	
Total Dissolved Solids	mg/L	07/26/2011	N002	8.6	-	18.6	1400		F	#	40	
Turbidity	NTU	07/26/2011	N001	8.6	-	18.6	8.08		F	#		
Uranium	mg/L	07/26/2011	N001	8.6	-	18.6	0.049		F	#	0.0000029	
Uranium	mg/L	07/26/2011	N002	8.6	-	18.6	0.05		F	#	0.0000029	
Vanadium	mg/L	07/26/2011	N001	8.6	-	18.6	0.00043		UF	#	0.000015	
Vanadium	mg/L	07/26/2011	N002	8.6	-	18.6	0.0006		UF	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 10/18/2011
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 $CaCO_3$)	mg/L	07/26/2011	N001	2.67	-	7.67	184		F	#		
Arsenic	mg/L	07/26/2011	N001	2.67	-	7.67	0.0014		F	#	0.000015	
Oxidation Reduction Potential	mV	07/26/2011	N001	2.67	-	7.67	23.7		F	#		
pH	s.u.	07/26/2011	N001	2.67	-	7.67	7.09		F	#		
Specific Conductance	umhos /cm	07/26/2011	N001	2.67	-	7.67	514		F	#		
Temperature	C	07/26/2011	N001	2.67	-	7.67	18.26		F	#		
Total Dissolved Solids	mg/L	07/26/2011	N001	2.67	-	7.67	350		F	#	20	
Turbidity	NTU	07/26/2011	N001	2.67	-	7.67	5.16		F	#		
Uranium	mg/L	07/26/2011	N001	2.67	-	7.67	0.0026		F	#	0.0000029	
Vanadium	mg/L	07/26/2011	N001	2.67	-	7.67	0.00045		UF	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 10/18/2011
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 $CaCO_3$)	mg/L	07/26/2011	N001	2.92	-	7.92	289		F	#		
Arsenic	mg/L	07/26/2011	N001	2.92	-	7.92	0.005		F	#	0.000015	
Oxidation Reduction Potential	mV	07/26/2011	N001	2.92	-	7.92	11.9		F	#		
pH	s.u.	07/26/2011	N001	2.92	-	7.92	7.04		F	#		
Specific Conductance	umhos /cm	07/26/2011	N001	2.92	-	7.92	1194		F	#		
Temperature	C	07/26/2011	N001	2.92	-	7.92	14.06		F	#		
Total Dissolved Solids	mg/L	07/26/2011	N001	2.92	-	7.92	1000		F	#	20	
Turbidity	NTU	07/26/2011	N001	2.92	-	7.92	0.84		F	#		
Uranium	mg/L	07/26/2011	N001	2.92	-	7.92	0.19		F	#	0.000015	
Vanadium	mg/L	07/26/2011	N001	2.92	-	7.92	0.00038		UF	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 10/18/2011
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 $CaCO_3$)	mg/L	07/26/2011	N001	6.17	-	11.17	403		F	#		
Arsenic	mg/L	07/26/2011	N001	6.17	-	11.17	0.00086		FJ	#	0.000015	
Oxidation Reduction Potential	mV	07/26/2011	N001	6.17	-	11.17	50.7		F	#		
pH	s.u.	07/26/2011	N001	6.17	-	11.17	7.07		F	#		
Specific Conductance	umhos /cm	07/26/2011	N001	6.17	-	11.17	2328		F	#		
Temperature	C	07/26/2011	N001	6.17	-	11.17	15.66		F	#		
Total Dissolved Solids	mg/L	07/26/2011	N001	6.17	-	11.17	1700		F	#	40	
Turbidity	NTU	07/26/2011	N001	6.17	-	11.17	3.63		F	#		
Uranium	mg/L	07/26/2011	N001	6.17	-	11.17	0.61		F	#	0.000029	
Vanadium	mg/L	07/26/2011	N001	6.17	-	11.17	0.00057		UF	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 10/18/2011
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 $CaCO_3$)	mg/L	07/26/2011	N001	17	-	17.5	315		F	#		
Arsenic	mg/L	07/26/2011	N001	17	-	17.5	0.0088		F	#	0.000074	
Oxidation Reduction Potential	mV	07/26/2011	N001	17	-	17.5	1.5		F	#		
pH	s.u.	07/26/2011	N001	17	-	17.5	7.12		F	#		
Specific Conductance	umhos /cm	07/26/2011	N001	17	-	17.5	1788		F	#		
Temperature	C	07/26/2011	N001	17	-	17.5	14.36		F	#		
Total Dissolved Solids	mg/L	07/26/2011	N001	17	-	17.5	1400		F	#	40	
Turbidity	NTU	07/26/2011	N001	17	-	17.5	2.33		F	#		
Uranium	mg/L	07/26/2011	N001	17	-	17.5	0.55		F	#	0.000029	
Vanadium	mg/L	07/26/2011	N001	17	-	17.5	0.0039		UF	#	0.000076	

Groundwater Quality Data by Location (USEE100) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 10/18/2011
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 $CaCO_3$)	mg/L	07/26/2011	N001	6.42 - 11.42	217		F	#		
Arsenic	mg/L	07/26/2011	N001	6.42 - 11.42	0.0067		F	#	0.000074	
Oxidation Reduction Potential	mV	07/26/2011	N001	6.42 - 11.42	-1.7		F	#		
pH	s.u.	07/26/2011	N001	6.42 - 11.42	7.21		F	#		
Specific Conductance	umhos /cm	07/26/2011	N001	6.42 - 11.42	929		F	#		
Temperature	C	07/26/2011	N001	6.42 - 11.42	15.6		F	#		
Total Dissolved Solids	mg/L	07/26/2011	N001	6.42 - 11.42	690		F	#	20	
Turbidity	NTU	07/26/2011	N001	6.42 - 11.42	6.43		F	#		
Uranium	mg/L	07/26/2011	N001	6.42 - 11.42	0.13		F	#	0.000015	
Vanadium	mg/L	07/26/2011	N001	6.42 - 11.42	0.56		F	#	0.000076	

Groundwater Quality Data by Location (USEE100) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 10/18/2011
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 $CaCO_3$)	mg/L	07/26/2011	N001	6.3	-	11.3	267		F	#		
Arsenic	mg/L	07/26/2011	N001	6.3	-	11.3	0.025		F	#	0.000074	
Oxidation Reduction Potential	mV	07/26/2011	N001	6.3	-	11.3	18.8		F	#		
pH	s.u.	07/26/2011	N001	6.3	-	11.3	7.08		F	#		
Specific Conductance	umhos /cm	07/26/2011	N001	6.3	-	11.3	1510		F	#		
Temperature	C	07/26/2011	N001	6.3	-	11.3	14.84		F	#		
Total Dissolved Solids	mg/L	07/26/2011	N001	6.3	-	11.3	1200		F	#	40	
Turbidity	NTU	07/26/2011	N001	6.3	-	11.3	6.18		F	#		
Uranium	mg/L	07/26/2011	N001	6.3	-	11.3	0.31		F	#	0.000015	
Vanadium	mg/L	07/26/2011	N001	6.3	-	11.3	2.2		F	#	0.000076	

Groundwater Quality Data by Location (USEE100) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 10/18/2011
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 $CaCO_3$)	mg/L	07/26/2011	N001	10.67	-	15.67	411		F	#		
Arsenic	mg/L	07/26/2011	N001	10.67	-	15.67	0.00028	B	FJ	#	0.000074	
Oxidation Reduction Potential	mV	07/26/2011	N001	10.67	-	15.67	97		F	#		
pH	s.u.	07/26/2011	N001	10.67	-	15.67	7.15		F	#		
Specific Conductance	umhos /cm	07/26/2011	N001	10.67	-	15.67	3177		F	#		
Temperature	C	07/26/2011	N001	10.67	-	15.67	15.06		F	#		
Total Dissolved Solids	mg/L	07/26/2011	N001	10.67	-	15.67	2500		F	#	80	
Turbidity	NTU	07/26/2011	N001	10.67	-	15.67	1.04		F	#		
Uranium	mg/L	07/26/2011	N001	10.67	-	15.67	1.1		F	#	0.00015	
Vanadium	mg/L	07/26/2011	N001	10.67	-	15.67	0.0025		UF	#	0.000076	

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.

Surface Water Quality Data

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Surface Water Quality Data by Location (USEE102) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 10/18/2011
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 $CaCO_3$)	mg/L	07/26/2011	N001	107			#		
Arsenic	mg/L	07/26/2011	N001	0.00083	E		#	0.000015	
Oxidation Reduction Potential	mV	07/26/2011	N001	58.7			#		
pH	s.u.	07/26/2011	N001	8.4			#		
Specific Conductance	umhos/cm	07/26/2011	N001	363			#		
Temperature	C	07/26/2011	N001	18.65			#		
Total Dissolved Solids	mg/L	07/26/2011	N001	260			#	20	
Turbidity	NTU	07/26/2011	N001	17.1			#		
Uranium	mg/L	07/26/2011	N001	0.00071			#	0.0000029	
Vanadium	mg/L	07/26/2011	N001	0.00054		U	#	0.000015	

Surface Water Quality Data by Location (USEE102) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 10/18/2011
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 $CaCO_3$)	mg/L	07/26/2011	0001	87			#		
Arsenic	mg/L	07/26/2011	0001	0.00066			#	0.000015	
Total Dissolved Solids	mg/L	07/26/2011	0001	280			#	20	
Uranium	mg/L	07/26/2011	0001	0.0007			#	0.0000029	
Vanadium	mg/L	07/26/2011	0001	0.00056		U	#	0.000015	
Oxidation Reduction Potential	mV	07/26/2011	N001	184.9			#		
pH	s.u.	07/26/2011	N001	6.94			#		
Specific Conductance	umhos/cm	07/26/2011	N001	425			#		
Temperature	C	07/26/2011	N001	19.61			#		
Turbidity	NTU	07/26/2011	N001	24.5			#		

Surface Water Quality Data by Location (USEE102) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 10/18/2011
Location: SM2 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	07/26/2011	0001	115			#		
Arsenic	mg/L	07/26/2011	0001	0.00076			#	0.000015	
Total Dissolved Solids	mg/L	07/26/2011	0001	250			#	20	
Uranium	mg/L	07/26/2011	0001	0.00062			#	0.0000029	
Vanadium	mg/L	07/26/2011	0001	0.00057		U	#	0.000015	
Oxidation Reduction Potential	mV	07/26/2011	N001	49.9			#		
pH	s.u.	07/26/2011	N001	8.37			#		
Specific Conductance	umhos/cm	07/26/2011	N001	375			#		
Temperature	C	07/26/2011	N001	18.67			#		
Turbidity	NTU	07/26/2011	N001	14.2			#		

Surface Water Quality Data by Location (USEE102) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 10/18/2011
Location: SM4 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	07/26/2011	0001	114			#		
Arsenic	mg/L	07/26/2011	0001	0.00082			#	0.000015	
Total Dissolved Solids	mg/L	07/26/2011	0001	240			#	20	
Uranium	mg/L	07/26/2011	0001	0.00068			#	0.0000029	
Vanadium	mg/L	07/26/2011	0001	0.00062		U	#	0.000015	
Oxidation Reduction Potential	mV	07/26/2011	N001	-1.1			#		
pH	s.u.	07/26/2011	N001	8.31			#		
Specific Conductance	umhos/cm	07/26/2011	N001	363			#		
Temperature	C	07/26/2011	N001	20.85			#		
Turbidity	NTU	07/26/2011	N001	21.8			#		

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.
- L Less than 3 bore volumes purged prior to sampling.
- U Parameter analyzed for but was not detected.
- G Possible grout contamination, pH > 9.
- Q Qualitative result due to sampling technique.
- X Location is undefined.
- J Estimated value.
- R Unusable result.

QA QUALIFIER:
- # Validated according to quality assurance guidelines.

Equipment Blank Data

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BLANKS REPORT
LAB: PARAGON/ALS LABORATORY GROUP (Fort Collins, CO)
RIN: 11073963
Report Date: 10/18/2011

Parameter	Site Code	Location ID	Sample Date	ID	Units	Result	Qualifiers Lab	Qualifiers Data	Detection Limit	Uncertainty	Sample Type
Arsenic	NAT01	0999	07/26/2011	N001	mg/L	0.000015	U	J	0.000015		E
Total Dissolved Solids	NAT01	0999	07/26/2011	N001	mg/L	20	U		20		E
Uranium	NAT01	0999	07/26/2011	N001	mg/L	0.0000029	U		0.0000029		E
Vanadium	NAT01	0999	07/26/2011	N001	mg/L	0.000096	B	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.
- L Less than 3 bore volumes purged prior to sampling.
- U Parameter analyzed for but was not detected.
- G Possible grout contamination, pH > 9.
- Q Qualitative result due to sampling technique.
- X Location is undefined.
- J Estimated value.
- R Unusable result.

SAMPLE TYPES:
- E Equipment Blank.

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Static Water Level Data

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STATIC WATER LEVELS (USEE700) FOR SITE NAT01, Naturita Processing Site
REPORT DATE: 10/18/2011

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			07/26/2011	11:58:55	6.41	NA	E
0718			07/26/2011	11:13:35	10.79	NA	E
DM1		5310.81	07/26/2011	15:35:56	7.84	5302.97	
MAU07		5280.88	07/26/2011	12:33:11	6	5274.88	
MAU08		5291.19	07/26/2011	12:57:07	10.84	5280.35	
NAT01-1		5295.46	07/26/2011	13:48:57	12.22	5283.24	
NAT02		5294.09	07/26/2011	14:49:58	6.84	5287.25	
NAT08		5292.73	07/26/2011	14:31:47	7.11	5285.62	
NAT26		5300.21	07/26/2011	13:25:54	16.55	5283.66	

FLOW CODES: B BACKGROUND C CROSS GRADIENT D DOWN GRADIENT F OFF SITE
N UNKNOWN O ON SITE U UPGRADIENT

WATER LEVEL FLAGS: D Dry F FLOWING E TOP OF CASING ELEVATION DATA NOT AVAILABLE

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Hydrographs

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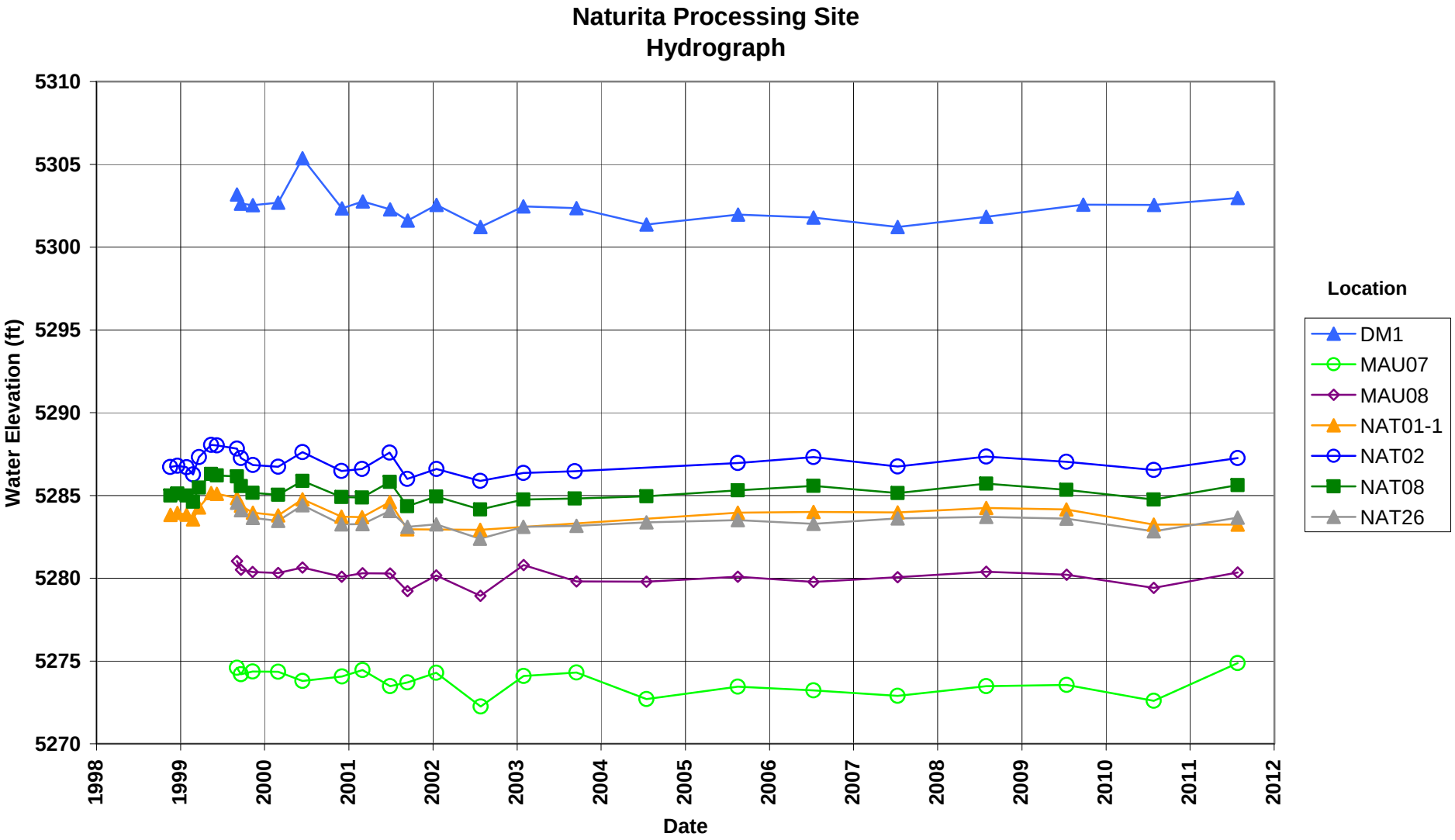
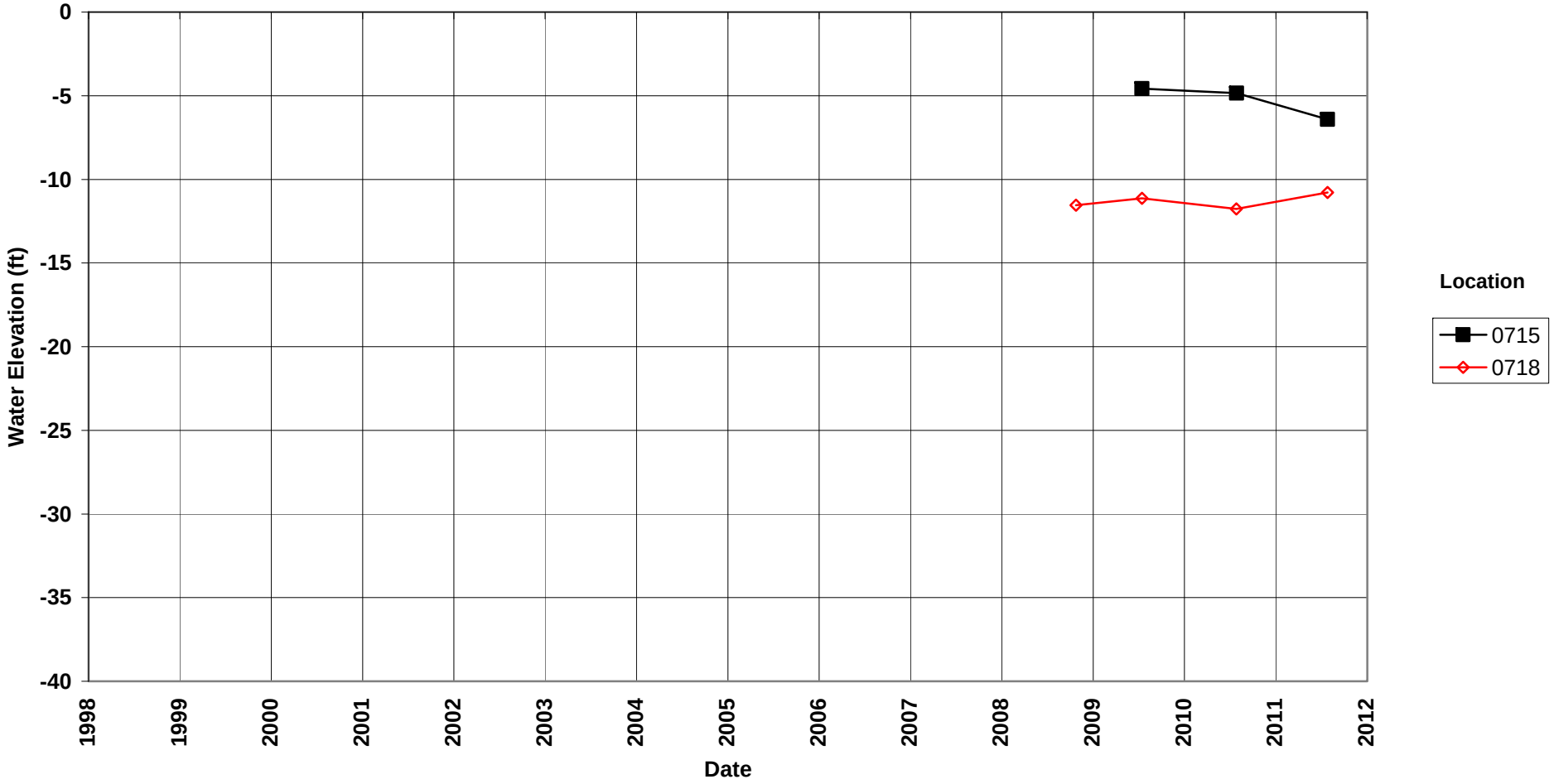

Naturita Processing Site
Hydrograph
Water Elevation (ft)
5310
5305
5300
5295
5290
5285
5280
5275
5270
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
Date
Location
DM1
MAU07
MAU08
NAT01-1
NAT02
NAT08
NAT26

-

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



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Time-Concentration Graphs

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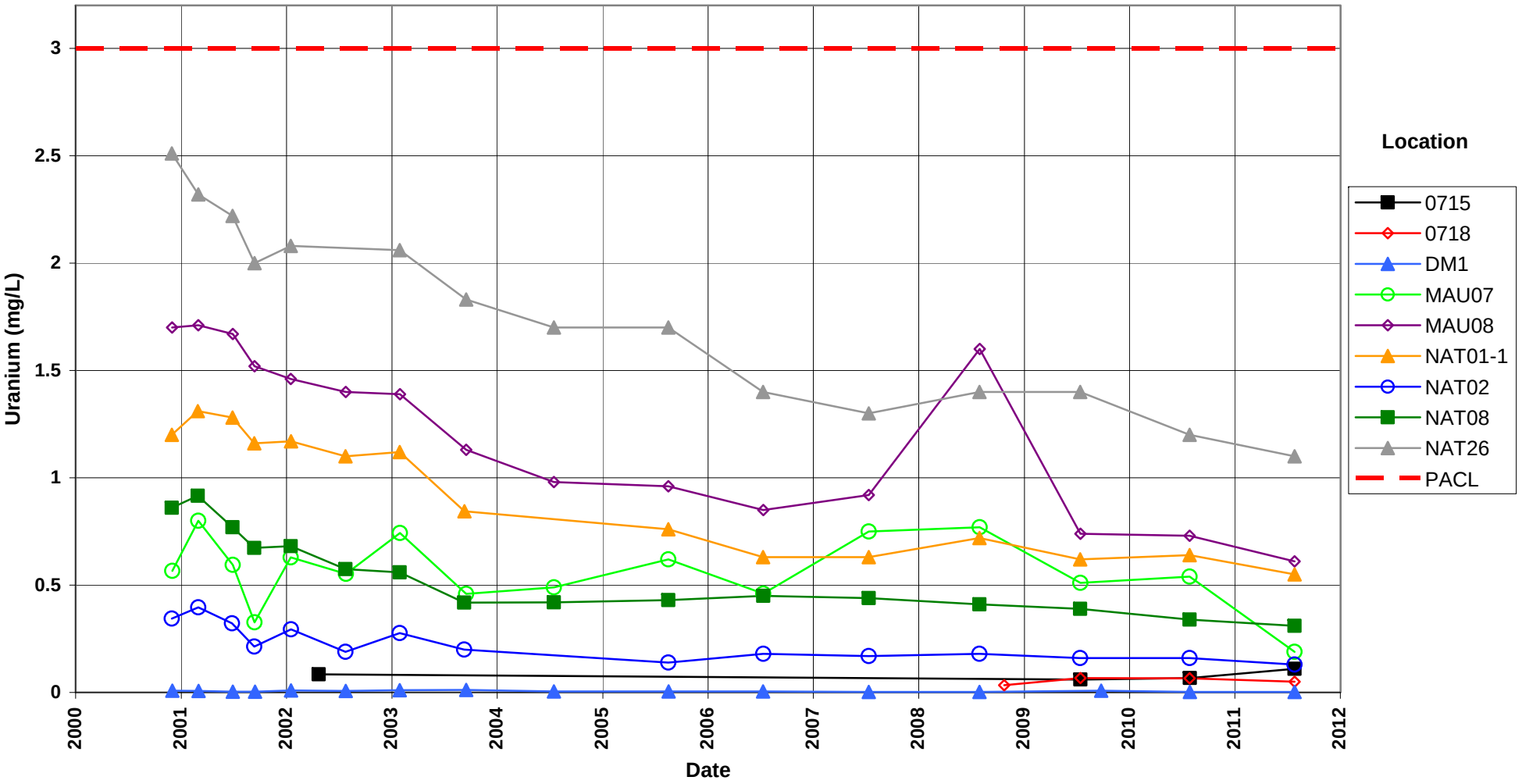
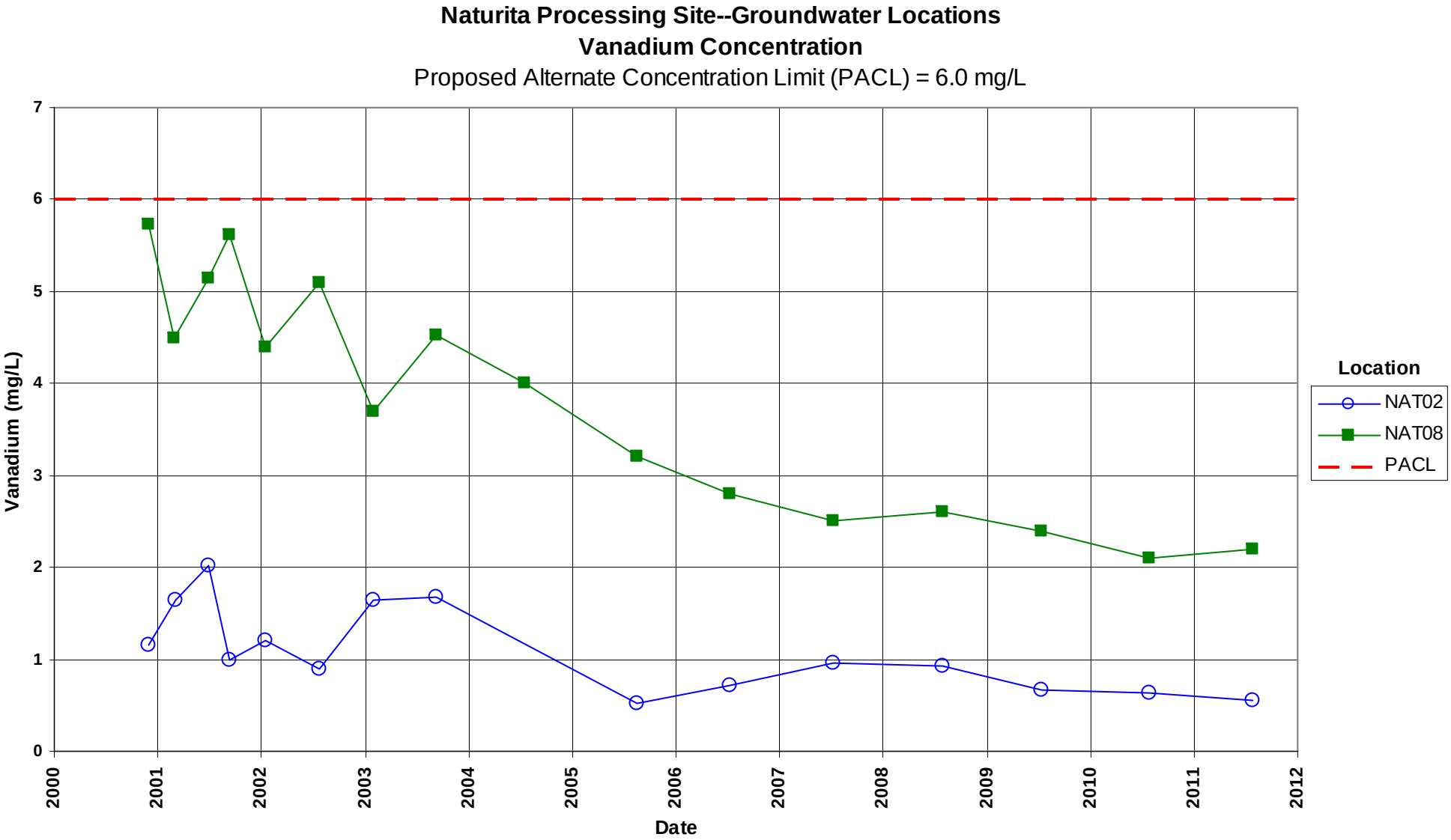
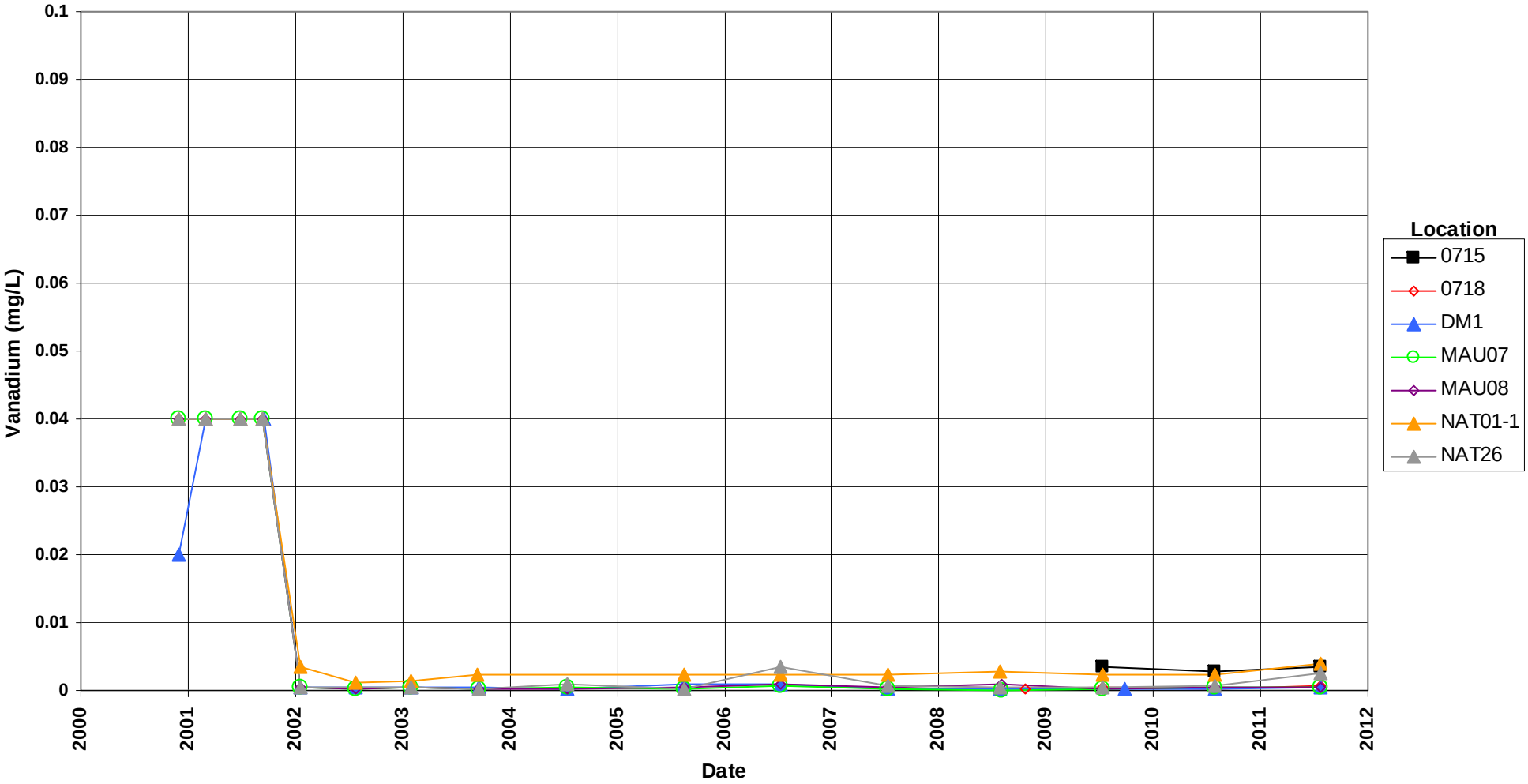
Naturita Processing Site--Groundwater Locations
Uranium Concentration
Proposed Alternate Concentration Limit (PACL) = 3.0 mg/L

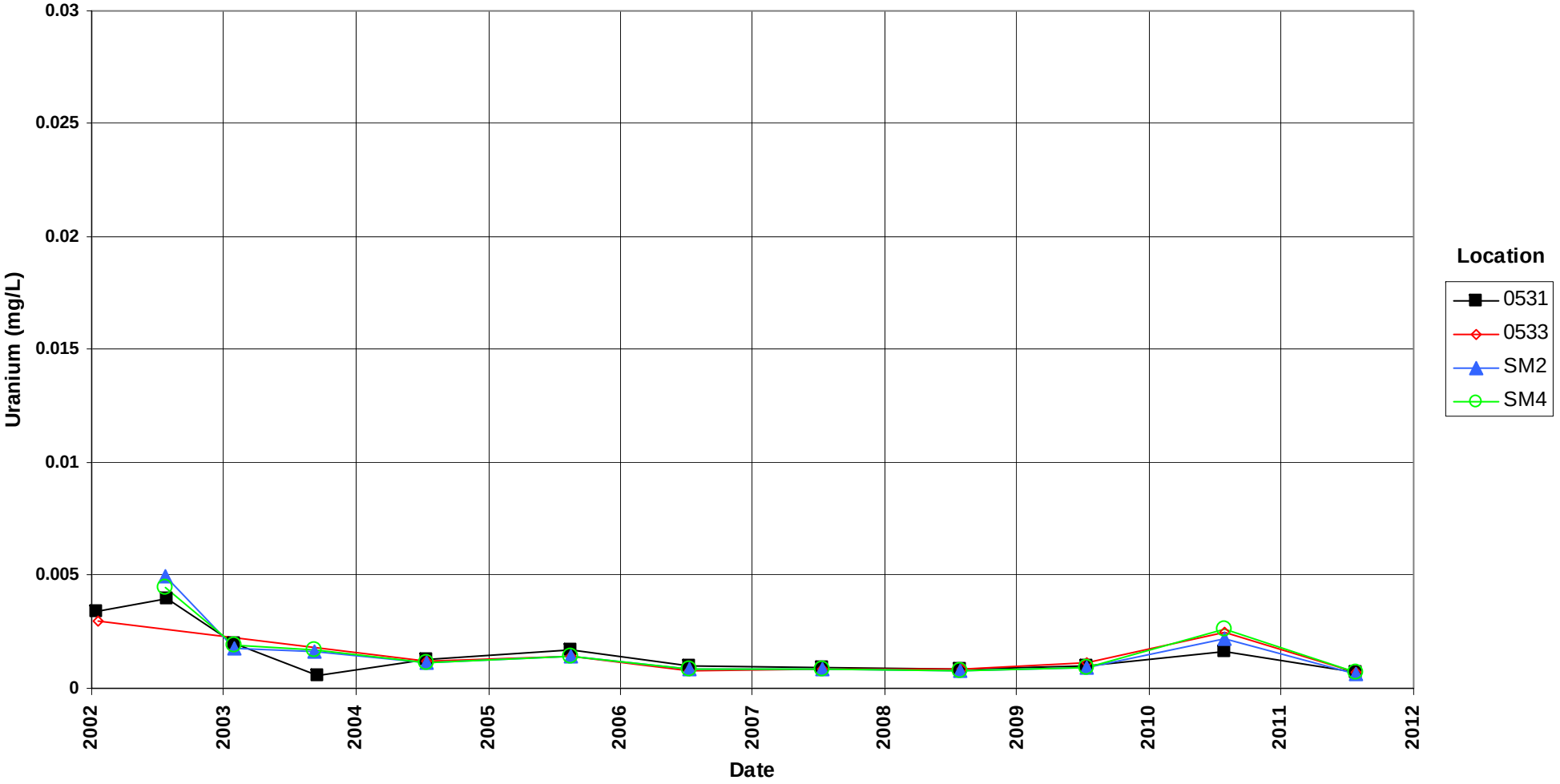



Naturita Processing Site--Groundwater Locations
Vanadium Concentration
Proposed Alternate Concentration Limit (PACL) = 6.0 mg/L
Vanadium (mg/L)
0
1
2
3
4
5
6
7
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
Date
Location
NAT02
NAT08
PACL

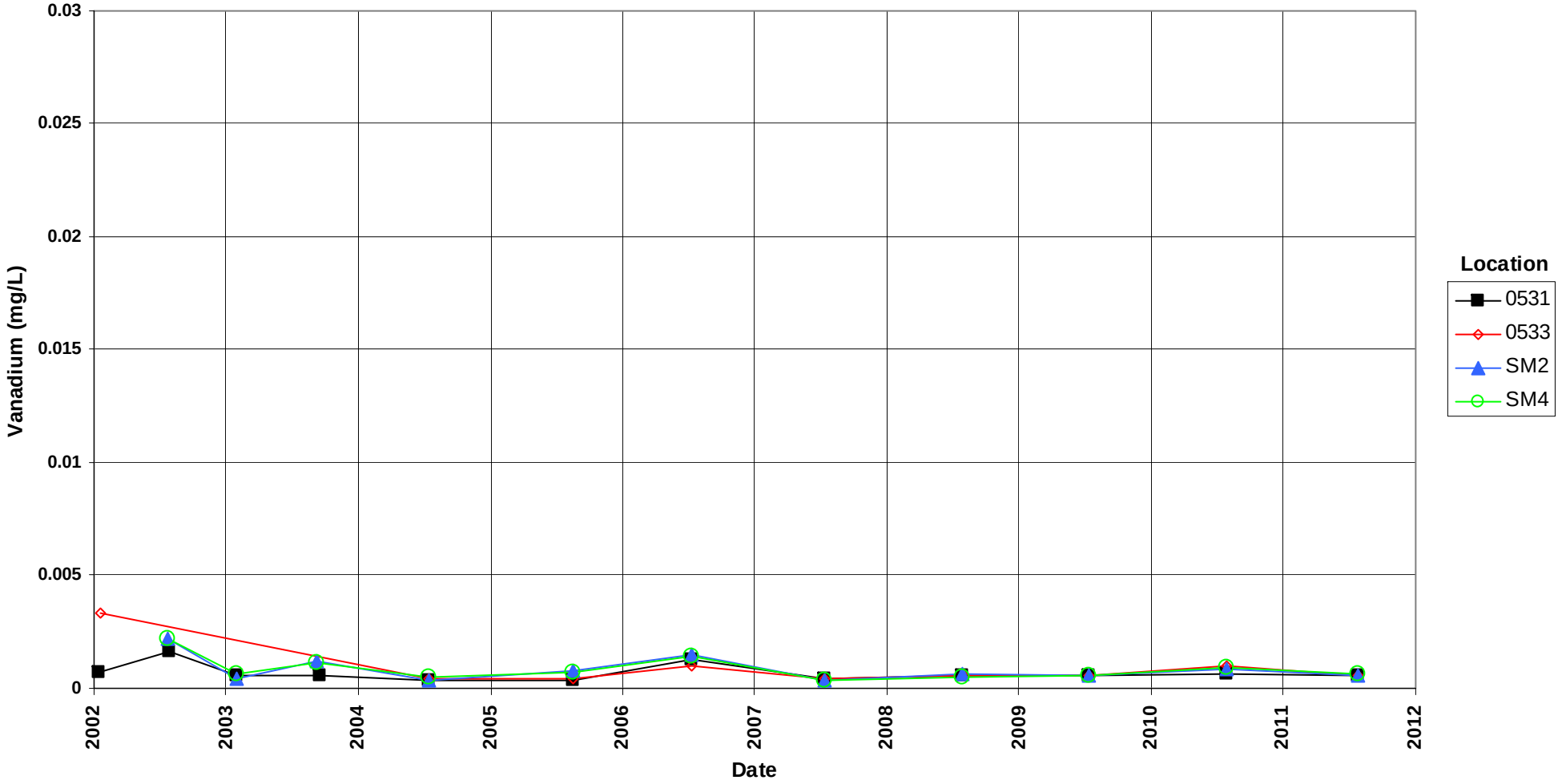
Naturita Processing Site--Groundwater Locations
Vanadium Concentration
Proposed Alternate Concentration Limit (PACL) = 6.0 mg/L



Naturita Processing Site--Surface Water Locations
Uranium Concentration
Proposed Alternate Concentration Limit (PACL) = 3.0 mg/L



Naturita Processing Site--Surface Water Locations
Vanadium Concentration
Proposed Alternate Concentration Limit (PACL) = 6.0 mg/L



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Attachment 3
Sampling and Analysis Work Order

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Stoller

established 1959

Task Order LM00-501
Control Number 11-0708

June 6, 2011

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

SUBJECT: Contract No. DE-AM01-07LM00060, S.M. Stoller Corporation (Stoller)
July 2011 Environmental Sampling at Naturita, Colorado, Processing Site

REFERENCE: Task Order LM00-501-02-115-402, Naturita, CO, Processing Site

Dear Mr. Kautsky:

The purpose of this letter is to inform you of the upcoming sampling event at Naturita, CO. Enclosed are the maps and tables specifying sample locations and analytes for monitoring at the Naturita, CO, Processing Site. 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 25, 2011.

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	

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

Surface Locations (filtered)

0531	0533	SM2	SM4

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.

The S.M. Stoller Corporation 2597 Legacy Way Grand Junction, CO 81503 (970) 248-6000 Fax (970) 248-6040

Sincerely,

David Traub

David Traub
Site Lead

DT/lcg/lb

Enclosures

cc: (electronic)
Steve Donivan, Stoller
Bev Gallagher, Stoller
Lauren Goodknight, Stoller
David Traub, Stoller
EDD Delivery
rc-grand.junction
File: NAP 410.02 (A)

The S.M. Stoller Corporation 2597 Legacy Way Grand Junction, CO 81503 (970) 248-6000 Fax (970) 248-6040

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 private well samples are to be unfiltered. The total number of analytes does not include field parameters.

Sampling Frequencies for Locations at Naturita, Colorado

Location ID	Quarterly	Semiannually	Annually	Biennially	Not Sampled	Notes
Monitoring Wells						
NAT01						
715			X			
718			X			
NAT01-1			X			
NAT02			X			
NAT08			X			
NAT26			X			
MAU07			X			
MAU08			X			
DM1			X			
Surface Locations						
531			X			
533			X			
SM2			X			
SM4			X			

Annual sampling conducted in July

Attachment 4
Trip Report

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Stoller
Grand Junction Office
established 1959

Memorandum

Control Number N/A

DATE: August 8, 2011

TO: David Traub

FROM: Jeff Walters

SUBJECT: Trip Report

Site: Naturita, CO. Processing Site

Dates of Sampling Event: July 26, 2011.

Team Members: Joe Trevino and Jeff Walters

Number of Locations Sampled: 9 monitoring wells and 4 surface water locations for As, U, V, and TDS.

Locations Not Sampled/Reason: None.

Location Specific Information:

Date	Sample Location	Ticket Number	Sample Time	Notes
7/26/2011	0715	JIX 122	1158	Cat I.; need 1" cap
7/26/2011	0718	JIX 123	1113	Cat I. Red/orange organics intermittent in purge water.
7/26/2011	NAT01-1	JIX 110	1348	Cat I. Water level is approximate to calculate purge volume.
7/26/2011	NAT02	JIX 111	1449	Cat I
7/26/2011	NAT08	JIX 112	1431	Cat I
7/26/2011	NAT26	JIX 113	1325	Cat I
7/26/2011	MAU07	JIX 114	1233	Cat I.; need 2" cap
7/26/2011	MAU08	JIX 115	1257	Cat I
7/26/2011	DM1	JIX 124	1535	Cat I
7/26/2011	0531	JIX 116	1556	Surface Water
7/26/2011	0533	JIX 117	1035	Surface Water
7/26/2011	SM2	JIX 118	1509	Surface Water
7/26/2011	SM4	JIX 119	1401	Surface Water

Field Variance: Water level in NAT01-01 could not be measured during purging. Well diameter (1/2") is too small to get water level indicator and tubing in the well at the same time.

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

False ID	True ID	Sample Type	Ticket Number	Notes
2517	------	Equipment Blank	JIX 121	Collected after sampling 0533
2986	0718	Duplicate	JIX 109	

Requisition Number Assigned: All samples were assigned to requisition identification number (RIN) 11073963. All samples were shipped from Grand Junction via Fed-Ex to ALS Laboratory Group on July 27, 2011.

Water Level Measurements: Water levels were measured at all sampled monitoring wells.

Well Inspection Summary: Well 0715 needs a surface casing and a 1" cap. Well MAU07 needs a 2" cap. All wells need to be labeled. Wells were labeled with a sharpie but that will not last; otherwise all wells are in good condition.

Equipment: All wells are equipped with dedicated tubing and all were sampled with a peristaltic pump. The surface water locations were sampled using a peristaltic pump and lanyard with tubing and a stainless steel weight, or by container immersion. The post trip operations check was not recorded in the Field Data Collection System. The final readings are: Conductivity 999= 986 at 22.88C, PH4= 4.03 at 22.81C, ORP 231= 241 at 23.0C. Cold tap water check: PH= 7.42, ORP= 181.5.

Regulatory: N/A

Institutional Controls

Fences, Gates, Locks: OK
Signs: Not applicable.
Trespassing/Site Disturbances: None Observed.

Site Issues: None Observed

Disposal Cell/Drainage Structure Integrity: Not applicable.
Vegetation/Noxious Weed Concerns: Not applicable.
Maintenance Requirements: None.

Access Issues: None. Landowner where well 0715 is located asked to be called prior to sampling; 970-864-7913.

Corrective Action Required/Taken: None.

(JWW/lcg)

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