Data Validation Package

June 2011
Groundwater and Surface Water Sampling at the Durango, Colorado, Disposal Site and Processing Site

August 2011

U.S. DEPARTMENT OF ENERGY | Legacy Management

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Sampling Event Summary

Site: Durango, Colorado, Disposal and Processing Sites

Sampling Period: June 27–29, 2011

Annual groundwater and surface water sampling was conducted at the Durango, Colorado, Disposal and Processing sites as specified is the applicable site documents. Sampling and analysis was 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). Water levels were measured at each sampled well.

The 2011 *Long-Term Surveillance Plan for the Durango Disposal Site, Durango, Colorado* (LTSP), requires annual monitoring to verify the performance of the disposal cell. Point-of-compliance wells 0607, 0612, and 0621, and monitoring wells 0605, 0608, 0618, and 0623 were sampled as specified in the plan. The concentrations of the indicator parameters (molybdenum, selenium, and uranium) in the point of compliance wells were below their respective 2011 LTSP approved concentration limits of 0.22 milligram per liter (mg/L), 0.42 mg/L, and 0.077 mg/L. The uranium concentration in monitoring well 0618 has been generally increasing since 2005 and is now 0.088 mg/L, which exceeds the 0.077 mg/L approved concentration limit.

The 2003 *Preliminary Final Ground Water Compliance Action Plan for the Durango, Colorado, UMTRA Project Site* requires annual monitoring of groundwater and surface water from the Mill Tailings area to determine progress of the natural flushing process in meeting compliance standards. Groundwater and surface water samples were also collected at the Raffinate Pond area as a best management practice to monitor selenium and uranium concentrations.

EPA groundwater standards for cadmium, selenium, and uranium were exceeded in samples collected from processing site monitoring wells as shown in Table 1 on the following page. Results from this sampling event are generally consistent with contaminant concentrations previously observed. In reviewing the time-concentration graphs included in this report, the selenium concentration at well 0633 continues to fluctuate significantly as has been observed since 2007.

Surface water contaminant concentrations were compared to the values obtained at upgradient locations on the Animas River (0652) and South Creek (0588). The uranium concentration (0.022 mg/L) from location 0588 is an indicator of the quality of water entering the site. Surface water results from Animas River locations adjacent to and downstream of the processing site were compared to statistical benchmark values derived using historical data from location 0652. As shown in Table 2, no benchmark values were exceeded at these locations, which indicates that the natural flushing strategy is not adversely affecting water quality in the Animas River.

Table 1. Durango Processing Site Wells Exceeding EPA Standards in June 2011

Analyte	Standard[a]	Cleanup Goal[b]	Site Code[c]	Location	Concentration (mg/L)
Cadmium	0.01	Not applicable	DUR01	0612	0.039
Selenium	0.01	0.05	DUR01	0630	0.039
				0633	0.015
Selenium	0.01	0.05	DUR02	0598	0.24
				0607	0.46
				0884	0.74
Uranium	0.044	Not applicable	DUR01	0612	1.2
				0617	0.17
				0630	0.27
				0631	0.11
				0633	0.86
				0634	0.056
Uranium	0.044	Not applicable	DUR02	0594	0.049
				0598	0.11
				0618	0.088
				0884	0.12

[a] Standards are listed in 40 CFR 192.02 Table 1 to Subpart A; concentrations are in mg/L.
[b] Cleanup goal for selenium from the 2003 *Preliminary Final Ground Water Compliance Action Plan for the Durango, Colorado, UMTRA Project Site*. Concentrations are in mg/L.
[c] DUR01 = Mill Tailings Area; DUR02 = Raffinate Ponds Area.

Table 2. Comparison of Animas River Concentrations to Benchmarks

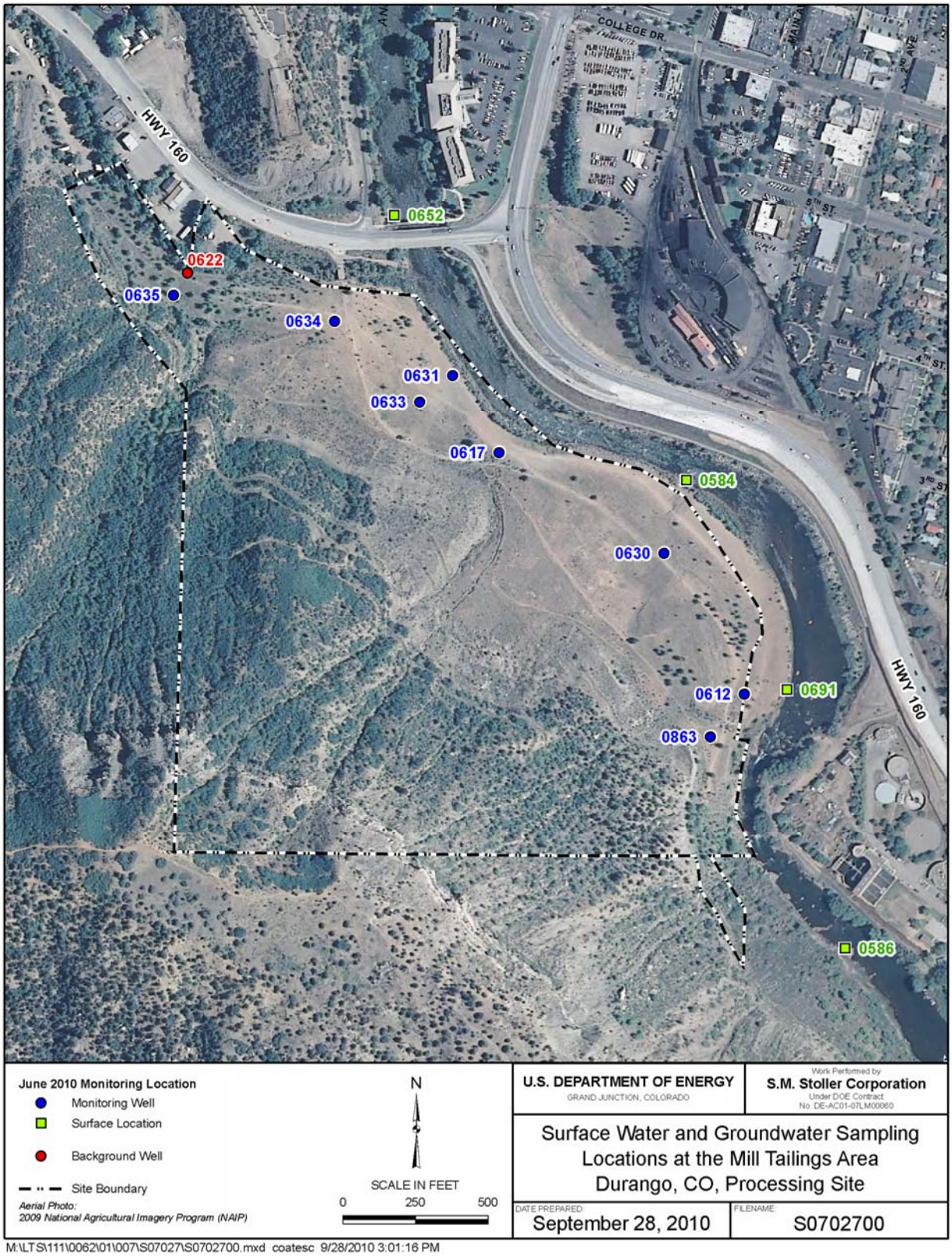
Analyte	Benchmark at 0652	Upgradient 0588	0584	0586	0654	0656	0691
Cadmium	0.0020	0.00020	0.00020	0.00034	0.00022	0.00030	0.00012
Molybdenum	0.010	0.00094	0.00049	0.00044	0.00037	0.00026	0.00026
Selenium	0.005	0.00091	0.00018	0.00019	0.00015	0.00018	0.00022
Uranium	0.0018	0.022	0.00019	0.00022	0.00032	0.00021	0.00025

Concentrations are in mg/L.

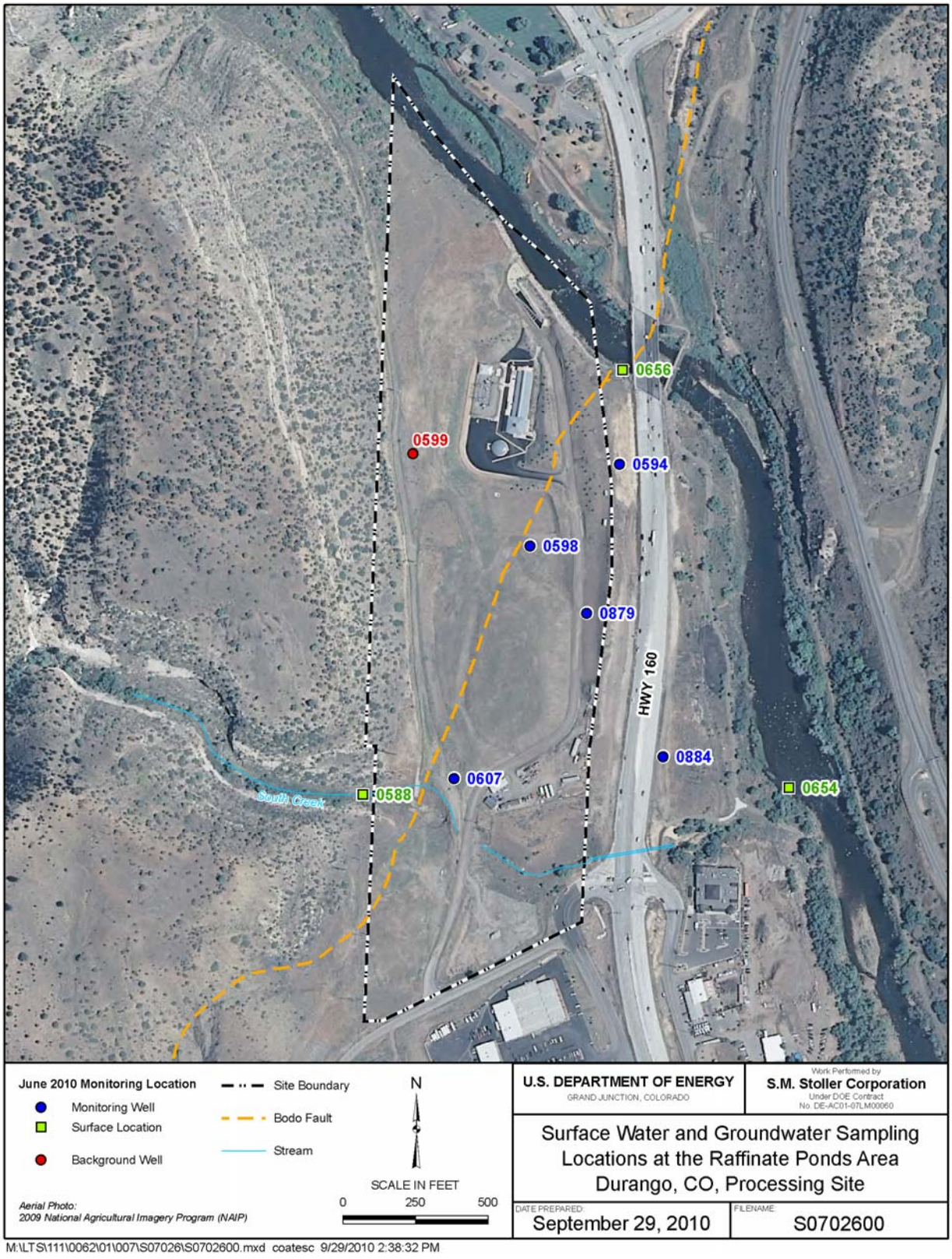
David Miller
Site Lead, S.M. Stoller Corporation

9/7/11
Date

Durango, Colorado, Disposal Site Sample Location Map



Durango Processing Site Mill Tailings Area Sample Location Map



Durango Processing Site Raffinate Ponds Area Sample Location Map

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Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	Durango, Colorado	**Date(s) of Water Sampling**	June 27–28, 2011
Date(s) of Verification	August 8, 2011	**Name of Verifier**	Steve Donivan

	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 May 24, 2011.
2. Were the sampling locations specified in the planning documents sampled?	No	Well DUR02-0879 was not sampled because of damage (see trip report).
3. Was a pre-trip calibration conducted as specified in the above-named documents?	Yes	Pre-trip calibration was performed on June 27, 2011.
4. Was an operational check of the field equipment conducted daily?	Yes	Four operational checks were performed.
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?	Yes	
Was one pump/tubing volume removed prior to sampling?	Yes	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	Duplicate samples were collected from wells DUR01-0612, DUR02-0884, and DUR03-0618.
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	
Was the true identity of the samples recorded on the Quality Assurance Sample Log or in the Field Data Collection System (FDCS) report?	Yes	
13. Were samples collected in the containers specified?	Yes	
14. Were samples filtered and preserved as specified?	Yes	
15. Were the number and types of samples collected as specified?	Yes	
16. Were 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):	11063904
Sample Event:	June 27-28, 2011
Site(s):	Durango, Colorado
Laboratory:	ALS Laboratory Group
Work Order No.:	1107018
Analysis:	Metals and Wet Chemistry
Validator:	Steve Donivan
Review Date:	August 5, 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 of 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 3.

Table 3. Analytes and Methods

Analyte	Line Item Code	Prep Method	Analytical Method
Chloride	MIS-A-045	SW-846 9056	SW-846 9056
Metals, Ca, Fe, K, Mg, Mn, Na	LMM-01	SW-846 3005A	SW-846 6010B
Metals, Cd, Mo, Se, U	LMM-02	SW-846 3005A	SW-846 6020A
Sulfate	MIS-A-045	SW-846 9056	SW-846 9056
Total Dissolved Solids	WCH-B-033	MCAWW 160.1	MCAWW 160.1

Data Qualifier Summary

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

Table 4. Data Qualifier Summary

Sample Number	Location	Analyte(s)	Flag	Reason
1107018-1	0584	Cadmium	J	Less than 5 times the equipment blank
1107018-2	0586	Cadmium	J	Less than 5 times the equipment blank
1107018-3	DUR01-0612	Molybdenum	J	Poor replicate precision
1107018-3	DUR01-0612	Selenium	J	Poor duplicate precision
1107018-10	0652	Cadmium	J	Less than 5 times the equipment blank
1107018-11	0691	Cadmium	J	Less than 5 times the equipment blank
1107018-12	0863	Selenium	U	Less than 5 times the calibration blank
1107018-13	Equipment blank	Selenium	U	Less than 5 times the calibration blank

Table 4 (continued). Data Qualifier Summary

Sample Number	Location	Analyte(s)	Flag	Reason
1107018-14	DUR01-0612 Duplicate	Selenium	J	Poor duplicate precision
1107018-15	0588	Cadmium	J	Less than 5 times the equipment blank
1107018-19	0654	Cadmium	J	Less than 5 times the equipment blank
1107018-20	0656	Cadmium	J	Less than 5 times the equipment blank
1107018-25	0608	Vanadium	U	Less than 5 times the calibration blank
1107018-27	0618	Vanadium	U	Less than 5 times the calibration blank
1107018-26	DUR03-0612	Magnesium	J	Serial dilution failure
1107018-28	0621	Vanadium	U	Less than 5 times the calibration blank

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received 30 water samples on July 1, 2011, accompanied by a Chain of Custody form. The receiving documentation included copies of the shipping labels listing the air waybill numbers. The 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 form had no errors or omissions.

Preservation and Holding Times

The sample shipment was received cool and intact with temperatures inside the iced cooler at 3.4 °C, which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses. All samples were analyzed within the applicable holding times.

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. All calibration and laboratory spike standards were prepared from independent sources.

Method SW-846 6010B
Calibrations for calcium, iron, magnesium, manganese, potassium, and sodium were performed on July 19, 2011, using single point calibrations. Initial and continuing calibration verification checks were made at the required frequency resulting in 14 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.

Method SW-846 6020A
Calibrations for cadmium, molybdenum, selenium, and uranium were performed on July 15, 2011, using four calibration standards. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the method detection limits (MDLs). Initial and continuing calibration verification checks were made at the required frequency resulting in 15 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 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 SW-846 9056
Initial calibrations were performed for chloride and sulfate using five calibration standards on June 15, 2010. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency resulting in 10 verification checks. All calibration check results were within the acceptance criteria.

Method EPA 160.1
There are no calibration requirements associated with the determination of total dissolved solids.

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 three sulfate calibration blanks. Sample results associated with these blanks were greater than 10 times the blank concentration. 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.

For manganese, some blank results were negative and the absolute values were greater than the MDL but less than the PQL. All associated results were greater than 5 times the MDL and required no qualification.

Inductively Coupled Plasma (ICP) Interference Check Sample (ICS) Analysis

ICP interference check samples ICSA and ICSAB were analyzed at the required frequency to verify the instrumental interelement and background correction factors. All check sample results met the acceptance criteria.

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. Matrix spikes are not required for

sodium, potassium, magnesium, and calcium; these results were evaluated only for acceptable precision.

Laboratory Replicate Analysis

Laboratory replicate sample results demonstrate acceptable laboratory precision. The relative percent difference values for the sample replicates and matrix spike replicates were less than 20 percent for results that are greater than 5 times the PQL, indicating acceptable precision for all analytes except molybdenum. The associated sample molybdenum result is qualified with a "J" flag as an estimated value.

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. Serial dilution data are evaluated when the concentration of the undiluted sample is greater than 50 times the PQL for method 6010 analytes, or 100 times the PQL for method 6020 analytes. The serial dilution data met the acceptance criteria for all data evaluated with the exception of magnesium. The associated sample magnesium result is qualified with a "J" flag as an estimated value.

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.

Chromatography Peak Integration

The integration of analyte peaks was reviewed for all ion chromatography data. There were no manual integrations performed and all peak integrations were satisfactory.

Electronic Data Deliverable (EDD) File

The EDD file received arrived on July 28, 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: 11063904 **Lab Code:** PAR **Validator:** Steve Donivan **Validation Date:** 8/5/2011

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

# of Samples: 30 **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 3 duplicates evaluated.

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 11063904 **Lab Code:** PAR **Date Due:** 7/29/2011

Matrix: Water **Site Code:** DUR **Date Completed:** 7/29/2011

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								
Cadmium	ICP/MS	07/15/2011	0.0000	1.0000	OK	OK	OK	OK	OK	108.0	100.0	101.0	0.0	103.0		105.0
Calcium	ICP/ES	07/20/2011	0.0000	1.0000	OK	OK	OK	OK	OK	100.0	93.0	92.0	1.0		6.0	
Iron	ICP/ES	07/20/2011	0.0000	1.0000	OK	OK	OK	OK	OK	102.0	97.0	96.0	1.0			
Magnesium	ICP/ES	07/20/2011	0.0000	1.0000	OK	OK	OK	OK	OK	104.0	95.0	93.0	2.0		18.0	
Manganese	ICP/ES	07/20/2011							OK	107.0	81.0	101.0	2.0		1.0	
Manganese	ICP/ES	07/20/2011							OK	106.0	101.0	100.0	2.0		8.0	
Molybdenum	ICP/MS	07/15/2011	0.0000	1.0000	OK	OK	OK	OK	OK	112.0	99.0	89.0	5.0	104.0		116.0
Molybdenum	ICP/MS	07/15/2011							OK	107.0	109.0	107.0	2.0	104.0		102.0
Molybdenum	ICP/MS	07/15/2011											21.0			
Potassium	ICP/ES	07/20/2011	0.0000	1.0000	OK	OK	OK	OK	OK	106.0	176.0	172.0	2.0			
Selenium	ICP/MS	07/15/2011	0.0000	1.0000	OK	OK	OK	OK	OK	111.0				104.0		119.0
Selenium	ICP/MS	07/15/2011							OK	111.0						
Selenium	ICP/MS	07/19/2011	0.0000	1.0000	OK	OK	OK	OK			106.0	106.0	0.0	106.0		103.0
Selenium	ICP/MS	07/19/2011									88.0	88.0	0.0			
Sodium	ICP/ES	07/20/2011	0.0000	1.0000	OK	OK	OK	OK	OK	97.0			1.0		10.0	
Uranium	ICP/MS	07/15/2011	0.0000	1.0000	OK	OK	OK	OK	OK	105.0			4.0	101.0	10.0	105.0
Uranium	ICP/MS	07/15/2011							OK	109.0	116.0	121.0	4.0			120.0
Vanadium	ICP/MS	07/15/2011	0.0000	1.0000	OK	OK	OK	OK	OK	114.0				114.0		123.0

SAMPLE MANAGEMENT SYSTEM

Wet Chemistry Data Validation Worksheet

RIN: 11063904 **Lab Code:** PAR **Date Due:** 7/29/2011

Matrix: Water **Site Code:** DUR **Date Completed:** 7/29/2011

Analyte	Date Analyzed	CALIBRATION						Method	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R^2	ICV	CCV	ICB	CCB	Blank					
CHLORIDE	07/06/2011	0.000	1.0000	OK	OK	OK	OK	OK	95.00				
CHLORIDE	07/07/2011									93.0	98.0	1.00	
SULFATE	07/06/2011	0.000	1.0000	OK	OK	OK	OK	OK	95.00	103.0	107.0	1.00	
SULFATE	07/07/2011									100.0	104.0	2.00	
TOTAL DISSOLVED SOLIDS	07/05/2011							OK	95.00			2.00	

Sampling Quality Control Assessment

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

Sampling Protocol

Sample results for all monitoring wells met the Category I or II low-flow sampling criteria and were qualified with an "F" flag in the database, indicating the wells were purged and sampled using the low-flow sampling method.

With the exception of well DUR03-0623, all monitoring wells were sampled using a peristaltic pump and dedicated tubing, or a dedicated bladder pump. Well DUR03-0623 was sampled with a bailer. Wells DUR01-0634, DUR02-0594, DUR02-0607, DUR03-0605, and DUR03-0612 were classified as Category II due to water-level drawdown. The sample results for these five wells were qualified with a "Q" flag, indicating the data are qualitative because of the sampling technique.

Surface water locations were sampled using a peristaltic pump.

Equipment Blank Assessment

An equipment blank (field ID 2170) was collected after decontamination of the hose reel used to collect the surface water samples. Cadmium and uranium were detected in this blank. The associated samples that are greater than the MDL, but less than 5 times the blank concentration are qualified with a "J" flag. The equipment blank results indicate adequate decontamination of the sampling equipment.

Field Duplicate Assessment

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 less than 5 times the PQL, the range should be no greater than the PQL. Duplicate samples were collected from wells DUR01-0612, DUR02-0884, and DUR03-0618. The duplicate selenium results from location DUR01-0612 did not meet the acceptance criteria. The associated sample and duplicate selenium results are qualified with a "J" flag as estimated values.

SAMPLE MANAGEMENT SYSTEM

Validation Report: Equipment/Trip Blanks

RIN: 11063904 **Lab Code:** PAR **Project:** Durango **Validation Date:** 8/5/2011

Blank Data

Blank Type	Lab Sample ID	Lab Method	Analyte Name	Result	Qualifier	MDL	Units
Equipment Blank	1107018-13	SW6020	Cadmium	0.12	B	0.058	UG/L

Sample ID	Sample Ticket	Location	Result	Dilution Factor	Lab Qualifier	Validation Qualifier
1107018-1	JHT 482	0584	0.2	5		J
1107018-10	JHT 484	0652	0.19	5		J
1107018-11	JHT 485	0691	0.12	5	B	J
1107018-15	JHT 486	0588	0.2	5		J
1107018-19	JHT 487	0654	0.22	5		J
1107018-2	JHT 483	0586	0.34	5		J
1107018-20	JHT 488	0656	0.3	5		J

Blank Data

Blank Type	Lab Sample ID	Lab Method	Analyte Name	Result	Qualifier	MDL	Units
Equipment Blank	1107018-13	SW6020	Uranium	0.03	B	0.015	UG/L

Sample ID	Sample Ticket	Location	Result	Dilution Factor	Lab Qualifier	Validation Qualifier
1107018-1	JHT 482	0584	0.19	5		
1107018-10	JHT 484	0652	0.2	5		
1107018-11	JHT 485	0691	0.25	5		
1107018-15	JHT 486	0588	22	5		
1107018-19	JHT 487	0654	0.32	5		
1107018-2	JHT 483	0586	0.22	5		
1107018-20	JHT 488	0656	0.21	5		

SAMPLE MANAGEMENT SYSTEM

Validation Report: Field Duplicates

RIN: 11063904 **Lab Code:** PAR **Project:** Durango **Validation Date:** 8/5/2011

Duplicate: 2171 **Sample:** 0612

Analyte	Sample Result	Sample Flag	Sample Error	Sample Dilution	Duplicate Result	Duplicate Flag	Duplicate Error	Duplicate Dilution	RPD	RER	Units
Cadmium	39			100	44			100	12.05		UG/L
Manganese	5100			1	5300			1	3.85		UG/L
Molybdenum	100	*		100	100			100	0		UG/L
Selenium	0.85			1	1.4			1	48.89		UG/L
SULFATE	1700			50	1800			50	5.71		MG/L
Uranium	1200			100	1200			100	0		UG/L

Duplicate: 2172 **Sample:** 0884

Analyte	Sample Result	Sample Flag	Sample Error	Sample Dilution	Duplicate Result	Duplicate Flag	Duplicate Error	Duplicate Dilution	RPD	RER	Units
Selenium	740			10	770			10	3.97		UG/L
Uranium	120			10	130			10	8.00		UG/L

Duplicate: 2173 **Sample:** 0618

Analyte	Sample Result	Sample Flag	Sample Error	Sample Dilution	Duplicate Result	Duplicate Flag	Duplicate Error	Duplicate Dilution	RPD	RER	Units
Calcium	270000			1	270000			1	0		UG/L
CHLORIDE	35			20	36			20	2.82		MG/L
Iron	4.9	U		1	4.9	U		1			UG/L
Magnesium	150000			1	160000			1	6.45		UG/L
Manganese	0.11	U		1	0.11	U		1			UG/L
Molybdenum	0.86			5	0.48	B		5			UG/L
Potassium	2700			1	2800			1	3.64		UG/L
Selenium	5.9			5	6			5	1.68		UG/L
Sodium	110000			1	110000			1	0		UG/L
SULFATE	1100			20	1100			20	0		MG/L
TOTAL DISSOLVED SOLIDS	2000			1	2000			1	0		MG/L
Uranium	88			5	84			5	4.65		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: 8-31-2011

Data Validation Lead: Steve Donivan — Date: 8-31-2011

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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.

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

Site Code	Location Code	Sample ID	Sample Date	Analyte	Current			Historical Maximum			Historical Minimum			Number of Data Points		Statistical Outlier
						Qualifiers			Qualifiers			Qualifiers				
					Result	*Lab*	*Data*	Result	*Lab*	*Data*	Result	*Lab*	*Data*	N	N Below Detect	
DUR01	0630	N001	06/28/2011	Selenium	0.039		F	0.033		FQ	0.0001	U	L	23	6	No
DUR01	0652	0001	06/28/2011	Molybdenum	0.00034	B		0.01	U		0.00041	B	U	26	17	No
DUR01	0691	0001	06/28/2011	Molybdenum	0.00026	B		0.1	U		0.00037	B	U	35	27	No
DUR01	0863	N001	06/28/2011	Molybdenum	0.00052		F	0.0074	B		0.00056		F	14	12	No
DUR01	0863	N001	06/28/2011	Uranium	0.000085		F	0.0028			0.000094		F	14	6	No
DUR02	0588	N001	06/28/2011	Molybdenum	0.00094			0.0033	U		0.0011			18	12	No
DUR02	0594	N001	06/28/2011	Selenium	0.00074		FQ	0.681			0.0015	U	L	15	4	No
DUR02	0656	0001	06/28/2011	Molybdenum	0.00026	B		0.01	U	RX	0.00034	B	U	21	17	No
DUR02	0884	N002	06/28/2011	Selenium	0.77		F	2.99		F	0.808		F	15	0	No
DUR02	0884	N001	06/28/2011	Selenium	0.74		F	2.99		F	0.808		F	15	0	No
DUR03	0608	N001	06/27/2011	Potassium	7.5		F	6.6			2			63	0	No
DUR03	0612	N001	06/27/2011	Uranium	0.000095		FQ	0.03			0.000097	B	UFQ	30	12	No
DUR03	0618	N002	06/27/2011	Molybdenum	0.00048	B	F	0.03			0.00055		F	15	13	No
DUR03	0621	N001	06/27/2011	Vanadium	0.00015	B	UF	0.05	U		0.00049		FQ	12	5	No
DUR03	0623	N001	06/27/2011	Molybdenum	0.00047	B		0.2			0.00093	B	UQ	36	24	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
Durango Disposal Site

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Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/12/2011
Location: 0605 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	06/27/2011	N001	36 - 56	701		FQ	#		
Calcium	mg/L	06/27/2011	N001	36 - 56	130		FQ	#	0.012	
Chloride	mg/L	06/27/2011	N001	36 - 56	32		FQ	#	2	
Iron	mg/L	06/27/2011	N001	36 - 56	0.029	B	FQ	#	0.0049	
Magnesium	mg/L	06/27/2011	N001	36 - 56	120		FQ	#	0.013	
Manganese	mg/L	06/27/2011	N001	36 - 56	0.031		FQ	#	0.00011	
Molybdenum	mg/L	06/27/2011	N001	36 - 56	0.00016	U	FQ	#	0.00016	
Oxidation Reduction Potential	mV	06/27/2011	N001	36 - 56	-140.8		FQ	#		
pH	s.u.	06/27/2011	N001	36 - 56	6.6		FQ	#		
Potassium	mg/L	06/27/2011	N001	36 - 56	10		FQ	#	0.11	
Selenium	mg/L	06/27/2011	N001	36 - 56	0.000062	B	FQ	#	0.000032	
Sodium	mg/L	06/27/2011	N001	36 - 56	280		FQ	#	0.066	
Specific Conductance	umhos /cm	06/27/2011	N001	36 - 56	2268		FQ	#		
Sulfate	mg/L	06/27/2011	N001	36 - 56	690		FQ	#	5	
Temperature	C	06/27/2011	N001	36 - 56	13.35		FQ	#		
Total Dissolved Solids	mg/L	06/27/2011	N001	36 - 56	1700		FQ	#	40	
Turbidity	NTU	06/27/2011	N001	36 - 56	4.49		FQ	#		
Uranium	mg/L	06/27/2011	N001	36 - 56	0.00006		FQ	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/12/2011
Location: 0607 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	06/27/2011	N001	36.7	-	56.7	410		F	#		
Calcium	mg/L	06/27/2011	N001	36.7	-	56.7	280		F	#	0.012	
Chloride	mg/L	06/27/2011	N001	36.7	-	56.7	15		F	#	1	
Iron	mg/L	06/27/2011	N001	36.7	-	56.7	0.036	B	F	#	0.0049	
Magnesium	mg/L	06/27/2011	N001	36.7	-	56.7	180		F	#	0.013	
Manganese	mg/L	06/27/2011	N001	36.7	-	56.7	0.072		F	#	0.00011	
Molybdenum	mg/L	06/27/2011	N001	36.7	-	56.7	0.00016	U	F	#	0.00016	
Oxidation Reduction Potential	mV	06/27/2011	N001	36.7	-	56.7	-225.9		F	#		
pH	s.u.	06/27/2011	N001	36.7	-	56.7	6.56		F	#		
Potassium	mg/L	06/27/2011	N001	36.7	-	56.7	9.7		F	#	0.11	
Selenium	mg/L	06/27/2011	N001	36.7	-	56.7	0.00011		F	#	0.000032	
Sodium	mg/L	06/27/2011	N001	36.7	-	56.7	310		F	#	0.066	
Specific Conductance	umhos /cm	06/27/2011	N001	36.7	-	56.7	3135		F	#		
Sulfate	mg/L	06/27/2011	N001	36.7	-	56.7	1700		F	#	25	
Temperature	C	06/27/2011	N001	36.7	-	56.7	15.01		F	#		
Total Dissolved Solids	mg/L	06/27/2011	N001	36.7	-	56.7	3000		F	#	80	
Turbidity	NTU	06/27/2011	N001	36.7	-	56.7	1.21		F	#		
Uranium	mg/L	06/27/2011	N001	36.7	-	56.7	0.00013		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/12/2011
Location: 0608 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	06/27/2011	N001	29	-	39	315		F	#		
Calcium	mg/L	06/27/2011	N001	29	-	39	170		F	#	0.012	
Chloride	mg/L	06/27/2011	N001	29	-	39	17		F	#	2	
Iron	mg/L	06/27/2011	N001	29	-	39	0.016	B	F	#	0.0049	
Magnesium	mg/L	06/27/2011	N001	29	-	39	100		F	#	0.013	
Manganese	mg/L	06/27/2011	N001	29	-	39	0.00049	B	F	#	0.00011	
Molybdenum	mg/L	06/27/2011	N001	29	-	39	0.0011		F	#	0.00016	
Oxidation Reduction Potential	mV	06/27/2011	N001	29	-	39	27.2		F	#		
pH	s.u.	06/27/2011	N001	29	-	39	6.75		F	#		
Potassium	mg/L	06/27/2011	N001	29	-	39	7.5		F	#	0.11	
Selenium	mg/L	06/27/2011	N001	29	-	39	0.0031		F	#	0.00016	
Sodium	mg/L	06/27/2011	N001	29	-	39	68		F	#	0.0066	
Specific Conductance	umhos /cm	06/27/2011	N001	29	-	39	1525		F	#		
Sulfate	mg/L	06/27/2011	N001	29	-	39	600		F	#	5	
Temperature	C	06/27/2011	N001	29	-	39	10.46		F	#		
Total Dissolved Solids	mg/L	06/27/2011	N001	29	-	39	1200		F	#	40	
Turbidity	NTU	06/27/2011	N001	29	-	39	4.08		F	#		
Uranium	mg/L	06/27/2011	N001	29	-	39	0.012		F	#	0.000015	
Vanadium	mg/L	06/27/2011	N001	29	-	39	0.00028	B	UF	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/12/2011
Location: 0612 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	06/27/2011	N001	98.09 - 108.09	2380		FQ	#		
Calcium	mg/L	06/27/2011	N001	98.09 - 108.09	6.5		FQ	#	0.012	
Chloride	mg/L	06/27/2011	N001	98.09 - 108.09	53		FQ	#	1	
Iron	mg/L	06/27/2011	N001	98.09 - 108.09	0.096	B	FQ	#	0.0049	
Magnesium	mg/L	06/27/2011	N001	98.09 - 108.09	4.2	E	FQJ	#	0.013	
Manganese	mg/L	06/27/2011	N001	98.09 - 108.09	0.0082		FQ	#	0.00011	
Molybdenum	mg/L	06/27/2011	N001	98.09 - 108.09	0.00016	U	FQ	#	0.00016	
Oxidation Reduction Potential	mV	06/27/2011	N001	98.09 - 108.09	-314.2		FQ	#		
pH	s.u.	06/27/2011	N001	98.09 - 108.09	7.47		FQ	#		
Potassium	mg/L	06/27/2011	N001	98.09 - 108.09	11	EN	FQ	#	0.11	
Selenium	mg/L	06/27/2011	N001	98.09 - 108.09	0.0001	B	FQ	#	0.000032	
Sodium	mg/L	06/27/2011	N001	98.09 - 108.09	1000		FQ	#	0.13	
Specific Conductance	umhos /cm	06/27/2011	N001	98.09 - 108.09	3721		FQ	#		
Sulfate	mg/L	06/27/2011	N001	98.09 - 108.09	40		FQ	#	2.5	
Temperature	C	06/27/2011	N001	98.09 - 108.09	14.56		FQ	#		
Total Dissolved Solids	mg/L	06/27/2011	N001	98.09 - 108.09	2700		FQ	#	80	
Turbidity	NTU	06/27/2011	N001	98.09 - 108.09	5.4		FQ	#		
Uranium	mg/L	06/27/2011	N001	98.09 - 108.09	0.000095		FQ	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/12/2011
Location: 0618 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	06/27/2011	N001	29.77 - 49.77	363		F	#		
Calcium	mg/L	06/27/2011	N001	29.77 - 49.77	270		F	#	0.012	
Calcium	mg/L	06/27/2011	N002	29.77 - 49.77	270		F	#	0.012	
Chloride	mg/L	06/27/2011	N001	29.77 - 49.77	35		F	#	4	
Chloride	mg/L	06/27/2011	N002	29.77 - 49.77	36		F	#	4	
Iron	mg/L	06/27/2011	N001	29.77 - 49.77	0.0049	U	F	#	0.0049	
Iron	mg/L	06/27/2011	N002	29.77 - 49.77	0.0049	U	F	#	0.0049	
Magnesium	mg/L	06/27/2011	N001	29.77 - 49.77	150		F	#	0.013	
Magnesium	mg/L	06/27/2011	N002	29.77 - 49.77	160		F	#	0.013	
Manganese	mg/L	06/27/2011	N001	29.77 - 49.77	0.00011	U	F	#	0.00011	
Manganese	mg/L	06/27/2011	N002	29.77 - 49.77	0.00011	U	F	#	0.00011	
Molybdenum	mg/L	06/27/2011	N001	29.77 - 49.77	0.00086		F	#	0.00016	
Molybdenum	mg/L	06/27/2011	N002	29.77 - 49.77	0.00048	B	F	#	0.00016	
Oxidation Reduction Potential	mV	06/27/2011	N001	29.77 - 49.77	35.6		F	#		
pH	s.u.	06/27/2011	N001	29.77 - 49.77	6.63		F	#		
Potassium	mg/L	06/27/2011	N001	29.77 - 49.77	2.7		F	#	0.11	
Potassium	mg/L	06/27/2011	N002	29.77 - 49.77	2.8		F	#	0.11	
Selenium	mg/L	06/27/2011	N001	29.77 - 49.77	0.0059		F	#	0.00016	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/12/2011
Location: 0618 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Selenium	mg/L	06/27/2011	N002	29.77 - 49.77	0.006		F	#	0.00016	
Sodium	mg/L	06/27/2011	N001	29.77 - 49.77	110		F	#	0.0066	
Sodium	mg/L	06/27/2011	N002	29.77 - 49.77	110		F	#	0.0066	
Specific Conductance	umhos /cm	06/27/2011	N001	29.77 - 49.77	2204		F	#		
Sulfate	mg/L	06/27/2011	N001	29.77 - 49.77	1100		F	#	10	
Sulfate	mg/L	06/27/2011	N002	29.77 - 49.77	1100		F	#	10	
Temperature	C	06/27/2011	N001	29.77 - 49.77	10.84		F	#		
Total Dissolved Solids	mg/L	06/27/2011	N001	29.77 - 49.77	2000		F	#	40	
Total Dissolved Solids	mg/L	06/27/2011	N002	29.77 - 49.77	2000		F	#	40	
Turbidity	NTU	06/27/2011	N001	29.77 - 49.77	0.93		F	#		
Uranium	mg/L	06/27/2011	N001	29.77 - 49.77	0.088		F	#	0.000015	
Uranium	mg/L	06/27/2011	N002	29.77 - 49.77	0.084		F	#	0.000015	
Vanadium	mg/L	06/27/2011	N001	29.77 - 49.77	0.00027	B	UF	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/12/2011
Location: 0621 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	06/27/2011	N001	78.46	-	88.46	0		F	#		
Calcium	mg/L	06/27/2011	N001	78.46	-	88.46	460		F	#	0.012	
Chloride	mg/L	06/27/2011	N001	78.46	-	88.46	12		F	#	1	
Iron	mg/L	06/27/2011	N001	78.46	-	88.46	150		F	#	0.0049	
Magnesium	mg/L	06/27/2011	N001	78.46	-	88.46	370		F	#	0.013	
Manganese	mg/L	06/27/2011	N001	78.46	-	88.46	2.9		F	#	0.00011	
Molybdenum	mg/L	06/27/2011	N001	78.46	-	88.46	0.00016	U	F	#	0.00016	
Oxidation Reduction Potential	mV	06/27/2011	N001	78.46	-	88.46	93.9		F	#		
pH	s.u.	06/27/2011	N001	78.46	-	88.46	4.65		F	#		
Potassium	mg/L	06/27/2011	N001	78.46	-	88.46	16		F	#	0.11	
Selenium	mg/L	06/27/2011	N001	78.46	-	88.46	0.0025		F	#	0.00016	
Sodium	mg/L	06/27/2011	N001	78.46	-	88.46	180		F	#	0.033	
Specific Conductance	umhos /cm	06/27/2011	N001	78.46	-	88.46	3901		F	#		
Sulfate	mg/L	06/27/2011	N001	78.46	-	88.46	3200		F	#	25	
Temperature	C	06/27/2011	N001	78.46	-	88.46	14.41		F	#		
Total Dissolved Solids	mg/L	06/27/2011	N001	78.46	-	88.46	4800		F	#	80	
Turbidity	NTU	06/27/2011	N001	78.46	-	88.46	8.61		F	#		
Uranium	mg/L	06/27/2011	N001	78.46	-	88.46	0.00013		F	#	0.000015	
Vanadium	mg/L	06/27/2011	N001	78.46	-	88.46	0.00015	B	UF	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/12/2011
Location: 0623 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	06/27/2011	N001	19.35 - 39.35	422			#		
Calcium	mg/L	06/27/2011	N001	19.35 - 39.35	260			#	0.012	
Chloride	mg/L	06/27/2011	N001	19.35 - 39.35	38			#	4	
Iron	mg/L	06/27/2011	N001	19.35 - 39.35	1			#	0.0049	
Magnesium	mg/L	06/27/2011	N001	19.35 - 39.35	240			#	0.013	
Manganese	mg/L	06/27/2011	N001	19.35 - 39.35	0.13			#	0.00011	
Molybdenum	mg/L	06/27/2011	N001	19.35 - 39.35	0.00047	B		#	0.00016	
Oxidation Reduction Potential	mV	06/27/2011	N001	19.35 - 39.35	20.7			#		
pH	s.u.	06/27/2011	N001	19.35 - 39.35	6.72			#		
Potassium	mg/L	06/27/2011	N001	19.35 - 39.35	3.3			#	0.11	
Selenium	mg/L	06/27/2011	N001	19.35 - 39.35	0.00061			#	0.000032	
Sodium	mg/L	06/27/2011	N001	19.35 - 39.35	150			#	0.033	
Specific Conductance	umhos /cm	06/27/2011	N001	19.35 - 39.35	2653			#		
Sulfate	mg/L	06/27/2011	N001	19.35 - 39.35	1400			#	10	
Temperature	C	06/27/2011	N001	19.35 - 39.35	15.59			#		
Total Dissolved Solids	mg/L	06/27/2011	N001	19.35 - 39.35	2500			#	40	
Turbidity	NTU	06/27/2011	N001	19.35 - 39.35	7.5			#		

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/12/2011
Location: 0623 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Uranium	mg/L	06/27/2011	N001	19.35	39.35	0.0044			#	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.

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Groundwater Quality Data
Durango Processing Site

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Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/12/2011
Location: 0612 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	06/28/2011	N001	37.41	-	57.41	410		F	#		
Cadmium	mg/L	06/28/2011	N001	37.41	-	57.41	0.039		F	#	0.0012	
Cadmium	mg/L	06/28/2011	N002	37.41	-	57.41	0.044		F	#	0.0012	
Manganese	mg/L	06/28/2011	N001	37.41	-	57.41	5.1		F	#	0.00011	
Manganese	mg/L	06/28/2011	N002	37.41	-	57.41	5.3		F	#	0.00011	
Molybdenum	mg/L	06/28/2011	N001	37.41	-	57.41	0.1	*	FJ	#	0.0032	
Molybdenum	mg/L	06/28/2011	N002	37.41	-	57.41	0.1		F	#	0.0032	
Oxidation Reduction Potential	mV	06/28/2011	N001	37.41	-	57.41	-156.3		F	#		
pH	s.u.	06/28/2011	N001	37.41	-	57.41	6.55		F	#		
Selenium	mg/L	06/28/2011	N001	37.41	-	57.41	0.00085		FJ	#	0.000032	
Selenium	mg/L	06/28/2011	N002	37.41	-	57.41	0.0014		FJ	#	0.000032	
Specific Conductance	umhos /cm	06/28/2011	N001	37.41	-	57.41	3597		F	#		
Sulfate	mg/L	06/28/2011	N001	37.41	-	57.41	1700		F	#	25	
Sulfate	mg/L	06/28/2011	N002	37.41	-	57.41	1800		F	#	25	
Temperature	C	06/28/2011	N001	37.41	-	57.41	12.67		F	#		
Turbidity	NTU	06/28/2011	N001	37.41	-	57.41	7.88		F	#		
Uranium	mg/L	06/28/2011	N001	37.41	-	57.41	1.2		F	#	0.00029	
Uranium	mg/L	06/28/2011	N002	37.41	-	57.41	1.2		F	#	0.00029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/12/2011
Location: 0617 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	06/28/2011	N001	14	-	29	409		F	#		
Manganese	mg/L	06/28/2011	N001	14	-	29	0.36		F	#	0.00011	
Molybdenum	mg/L	06/28/2011	N001	14	-	29	0.0087		F	#	0.00032	
Oxidation Reduction Potential	mV	06/28/2011	N001	14	-	29	-191.1		F	#		
pH	s.u.	06/28/2011	N001	14	-	29	6.68		F	#		
Selenium	mg/L	06/28/2011	N001	14	-	29	0.004		F	#	0.00032	
Specific Conductance	umhos /cm	06/28/2011	N001	14	-	29	3265		F	#		
Sulfate	mg/L	06/28/2011	N001	14	-	29	1900		F	#	25	
Temperature	C	06/28/2011	N001	14	-	29	12.27		F	#		
Turbidity	NTU	06/28/2011	N001	14	-	29	2.67		F	#		
Uranium	mg/L	06/28/2011	N001	14	-	29	0.17		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/12/2011
Location: 0630 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	06/28/2011	N001	28.3	-	38.3	300		F	#		
Manganese	mg/L	06/28/2011	N001	28.3	-	38.3	0.59		F	#	0.00011	
Molybdenum	mg/L	06/28/2011	N001	28.3	-	38.3	0.004		F	#	0.00032	
Oxidation Reduction Potential	mV	06/28/2011	N001	28.3	-	38.3	-148.1		F	#		
pH	s.u.	06/28/2011	N001	28.3	-	38.3	6.73		F	#		
Selenium	mg/L	06/28/2011	N001	28.3	-	38.3	0.039		F	#	0.00032	
Specific Conductance	umhos /cm	06/28/2011	N001	28.3	-	38.3	2985		F	#		
Sulfate	mg/L	06/28/2011	N001	28.3	-	38.3	1700		F	#	25	
Temperature	C	06/28/2011	N001	28.3	-	38.3	12.33		F	#		
Turbidity	NTU	06/28/2011	N001	28.3	-	38.3	4.54		F	#		
Uranium	mg/L	06/28/2011	N001	28.3	-	38.3	0.27		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/12/2011
Location: 0631 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	06/28/2011	N001	6	-	16	370		F	#		
Manganese	mg/L	06/28/2011	N001	6	-	16	0.29		F	#	0.00011	
Molybdenum	mg/L	06/28/2011	N001	6	-	16	0.0066		F	#	0.00032	
Oxidation Reduction Potential	mV	06/28/2011	N001	6	-	16	-206.3		F	#		
pH	s.u.	06/28/2011	N001	6	-	16	6.99		F	#		
Selenium	mg/L	06/28/2011	N001	6	-	16	0.0018		F	#	0.00032	
Specific Conductance	umhos /cm	06/28/2011	N001	6	-	16	1122		F	#		
Sulfate	mg/L	06/28/2011	N001	6	-	16	210		F	#	5	
Temperature	C	06/28/2011	N001	6	-	16	13.73		F	#		
Turbidity	NTU	06/28/2011	N001	6	-	16	0.63		F	#		
Uranium	mg/L	06/28/2011	N001	6	-	16	0.11		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/12/2011
Location: 0633 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	06/28/2011	N001	4	-	14	537		F	#		
Manganese	mg/L	06/28/2011	N001	4	-	14	0.26		F	#	0.00011	
Molybdenum	mg/L	06/28/2011	N001	4	-	14	0.0028		F	#	0.00032	
Oxidation Reduction Potential	mV	06/28/2011	N001	4	-	14	-191.8		F	#		
pH	s.u.	06/28/2011	N001	4	-	14	6.54		F	#		
Selenium	mg/L	06/28/2011	N001	4	-	14	0.015		F	#	0.0032	
Specific Conductance	umhos /cm	06/28/2011	N001	4	-	14	5329		F	#		
Sulfate	mg/L	06/28/2011	N001	4	-	14	3300		F	#	25	
Temperature	C	06/28/2011	N001	4	-	14	15.56		F	#		
Turbidity	NTU	06/28/2011	N001	4	-	14	3.15		F	#		
Uranium	mg/L	06/28/2011	N001	4	-	14	0.86		F	#	0.00029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/12/2011
Location: 0634 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	06/28/2011	N001	8	-	18	503		FQ	#		
Manganese	mg/L	06/28/2011	N001	8	-	18	0.27		FQ	#	0.00011	
Molybdenum	mg/L	06/28/2011	N001	8	-	18	0.00089		FQ	#	0.00016	
Oxidation Reduction Potential	mV	06/28/2011	N001	8	-	18	-183.7		FQ	#		
pH	s.u.	06/28/2011	N001	8	-	18	6.74		FQ	#		
Selenium	mg/L	06/28/2011	N001	8	-	18	0.00018		FQ	#	0.000032	
Specific Conductance	umhos /cm	06/28/2011	N001	8	-	18	4289		FQ	#		
Sulfate	mg/L	06/28/2011	N001	8	-	18	2400		FQ	#	25	
Temperature	C	06/28/2011	N001	8	-	18	13.44		FQ	#		
Turbidity	NTU	06/28/2011	N001	8	-	18	3.28		FQ	#		
Uranium	mg/L	06/28/2011	N001	8	-	18	0.056		FQ	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/12/2011
Location: 0635 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	06/28/2011	N001	5.5	-	15.5	440		F	#		
Manganese	mg/L	06/28/2011	N001	5.5	-	15.5	0.12		F	#	0.00011	
Molybdenum	mg/L	06/28/2011	N001	5.5	-	15.5	0.0015		F	#	0.00016	
Oxidation Reduction Potential	mV	06/28/2011	N001	5.5	-	15.5	-99.5		F	#		
pH	s.u.	06/28/2011	N001	5.5	-	15.5	6.68		F	#		
Selenium	mg/L	06/28/2011	N001	5.5	-	15.5	0.00032		F	#	0.000032	
Specific Conductance	umhos /cm	06/28/2011	N001	5.5	-	15.5	2447		F	#		
Sulfate	mg/L	06/28/2011	N001	5.5	-	15.5	1100		F	#	25	
Temperature	C	06/28/2011	N001	5.5	-	15.5	10.52		F	#		
Turbidity	NTU	06/28/2011	N001	5.5	-	15.5	4.16		F	#		
Uranium	mg/L	06/28/2011	N001	5.5	-	15.5	0.011		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/12/2011
Location: 0863 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	06/28/2011	N001	58	-	67.5	556		F	#		
Cadmium	mg/L	06/28/2011	N001	58	-	67.5	0.00011	B	F	#	0.000058	
Manganese	mg/L	06/28/2011	N001	58	-	67.5	0.11		F	#	0.00011	
Molybdenum	mg/L	06/28/2011	N001	58	-	67.5	0.00052		F	#	0.00016	
Oxidation Reduction Potential	mV	06/28/2011	N001	58	-	67.5	-169.6		F	#		
pH	s.u.	06/28/2011	N001	58	-	67.5	6.8		F	#		
Selenium	mg/L	06/28/2011	N001	58	-	67.5	0.000098	B	UF	#	0.000032	
Specific Conductance	umhos /cm	06/28/2011	N001	58	-	67.5	2179		F	#		
Sulfate	mg/L	06/28/2011	N001	58	-	67.5	690		F	#	10	
Temperature	C	06/28/2011	N001	58	-	67.5	12.69		F	#		
Turbidity	NTU	06/28/2011	N001	58	-	67.5	3.56		F	#		
Uranium	mg/L	06/28/2011	N001	58	-	67.5	0.000085		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 8/12/2011
Location: 0594 WELL Original location DH-116.

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	06/28/2011	N001	8.5	-	38.5	420		FQ	#		
Oxidation Reduction Potential	mV	06/28/2011	N001	8.5	-	38.5	-155.6		FQ	#		
pH	s.u.	06/28/2011	N001	8.5	-	38.5	6.59		FQ	#		
Selenium	mg/L	06/28/2011	N001	8.5	-	38.5	0.00074		FQ	#	0.00016	
Specific Conductance	umhos /cm	06/28/2011	N001	8.5	-	38.5	3741		FQ	#		
Temperature	C	06/28/2011	N001	8.5	-	38.5	15.96		FQ	#		
Turbidity	NTU	06/28/2011	N001	8.5	-	38.5	3.17		FQ	#		
Uranium	mg/L	06/28/2011	N001	8.5	-	38.5	0.049		FQ	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 8/12/2011
Location: 0598 WELL Original location Bureau of Rec well DH-110.

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	06/29/2011	N001	66.2	-	96.2	399		F	#		
Oxidation Reduction Potential	mV	06/29/2011	N001	66.2	-	96.2	-107.6		F	#		
pH	s.u.	06/29/2011	N001	66.2	-	96.2	6.73		F	#		
Selenium	mg/L	06/29/2011	N001	66.2	-	96.2	0.24		F	#	0.00032	
Specific Conductance	umhos /cm	06/29/2011	N001	66.2	-	96.2	7459		F	#		
Temperature	C	06/29/2011	N001	66.2	-	96.2	13.89		F	#		
Turbidity	NTU	06/29/2011	N001	66.2	-	96.2	8.94		F	#		
Uranium	mg/L	06/29/2011	N001	66.2	-	96.2	0.11		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 8/12/2011
Location: 0607 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	06/29/2011	N001	35	-	55	310		FQ	#		
Oxidation Reduction Potential	mV	06/29/2011	N001	35	-	55	142		FQ	#		
pH	s.u.	06/29/2011	N001	35	-	55	6.88		FQ	#		
Selenium	mg/L	06/29/2011	N001	35	-	55	0.46		FQ	#	0.00032	
Specific Conductance	umhos /cm	06/29/2011	N001	35	-	55	2944		FQ	#		
Temperature	C	06/29/2011	N001	35	-	55	14.74		FQ	#		
Turbidity	NTU	06/29/2011	N001	35	-	55	4.86		FQ	#		
Uranium	mg/L	06/29/2011	N001	35	-	55	0.0029		FQ	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 8/12/2011
Location: 0884 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	06/28/2011	N001	36.5	-	46.5	404		F	#		
Oxidation Reduction Potential	mV	06/28/2011	N001	36.5	-	46.5	-105.7		F	#		
pH	s.u.	06/28/2011	N001	36.5	-	46.5	6.74		F	#		
Selenium	mg/L	06/28/2011	N001	36.5	-	46.5	0.74		F	#	0.00032	
Selenium	mg/L	06/28/2011	N002	36.5	-	46.5	0.77		F	#	0.00032	
Specific Conductance	umhos /cm	06/28/2011	N001	36.5	-	46.5	3923		F	#		
Temperature	C	06/28/2011	N001	36.5	-	46.5	15.05		F	#		
Turbidity	NTU	06/28/2011	N001	36.5	-	46.5	2.02		F	#		
Uranium	mg/L	06/28/2011	N001	36.5	-	46.5	0.12		F	#	0.000029	
Uranium	mg/L	06/28/2011	N002	36.5	-	46.5	0.13		F	#	0.000029	

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.

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Surface Water Quality Data
Durango Processing Site

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Surface Water Quality Data by Location (USEE102) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/12/2011
Location: 0584 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	06/28/2011	0001	40			#		
Cadmium	mg/L	06/28/2011	0001	0.0002		J	#	0.000058	
Molybdenum	mg/L	06/28/2011	0001	0.00049	B		#	0.00016	
Selenium	mg/L	06/28/2011	0001	0.00018			#	0.000032	
Uranium	mg/L	06/28/2011	0001	0.00019			#	0.000015	
Oxidation Reduction Potential	mV	06/28/2011	N001	-127.9			#		
pH	s.u.	06/28/2011	N001	7.4			#		
Specific Conductance	umhos/cm	06/28/2011	N001	252			#		
Temperature	C	06/28/2011	N001	13.32			#		
Turbidity	NTU	06/28/2011	N001	19.6			#		

Surface Water Quality Data by Location (USEE102) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/12/2011
Location: 0586 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	06/28/2011	0001	42			#		
Cadmium	mg/L	06/28/2011	0001	0.00034		J	#	0.000058	
Molybdenum	mg/L	06/28/2011	0001	0.00044	B		#	0.00016	
Selenium	mg/L	06/28/2011	0001	0.00018			#	0.000032	
Uranium	mg/L	06/28/2011	0001	0.00022			#	0.000015	
Oxidation Reduction Potential	mV	06/28/2011	N001	-125			#		
pH	s.u.	06/28/2011	N001	7.26			#		
Specific Conductance	umhos/cm	06/28/2011	N001	236			#		
Temperature	C	06/28/2011	N001	19.5			#		
Turbidity	NTU	06/28/2011	N001	22.3			#		

Surface Water Quality Data by Location (USEE102) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/12/2011
Location: 0652 SURFACE LOCATION SURFACE WATER AND SED.

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/28/2011	0001	45			#		
Cadmium	mg/L	06/28/2011	0001	0.00019		J	#	0.000058	
Molybdenum	mg/L	06/28/2011	0001	0.00034	B		#	0.00016	
Selenium	mg/L	06/28/2011	0001	0.00018			#	0.000032	
Uranium	mg/L	06/28/2011	0001	0.0002			#	0.000015	
Oxidation Reduction Potential	mV	06/28/2011	N001	-115			#		
pH	s.u.	06/28/2011	N001	7.2			#		
Specific Conductance	umhos/cm	06/28/2011	N001	241			#		
Temperature	C	06/28/2011	N001	13.7			#		
Turbidity	NTU	06/28/2011	N001	25.5			#		

Surface Water Quality Data by Location (USEE102) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/12/2011
Location: 0691 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	06/28/2011	0001	36			#		
Cadmium	mg/L	06/28/2011	0001	0.00012	B	J	#	0.000058	
Molybdenum	mg/L	06/28/2011	0001	0.00026	B		#	0.00016	
Selenium	mg/L	06/28/2011	0001	0.00022			#	0.000032	
Uranium	mg/L	06/28/2011	0001	0.00025			#	0.000015	
Oxidation Reduction Potential	mV	06/28/2011	N001	-146.8			#		
pH	s.u.	06/28/2011	N001	7.24			#		
Specific Conductance	umhos/cm	06/28/2011	N001	253			#		
Temperature	C	06/28/2011	N001	13.71			#		
Turbidity	NTU	06/28/2011	N001	23.1			#		

Surface Water Quality Data by Location (USEE102) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 8/12/2011
Location: 0588 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	06/28/2011	N001	275			#		
Cadmium	mg/L	06/28/2011	N001	0.0002		J	#	0.000058	
Molybdenum	mg/L	06/28/2011	N001	0.00094			#	0.00016	
Oxidation Reduction Potential	mV	06/28/2011	N001	-90.5			#		
pH	s.u.	06/28/2011	N001	8.01			#		
Selenium	mg/L	06/28/2011	N001	0.00091			#	0.00016	
Specific Conductance	umhos/cm	06/28/2011	N001	1635			#		
Temperature	C	06/28/2011	N001	25.68			#		
Turbidity	NTU	06/28/2011	N001	5.8			#		
Uranium	mg/L	06/28/2011	N001	0.022			#	0.000015	

Surface Water Quality Data by Location (USEE102) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 8/12/2011
Location: 0654 SURFACE LOCATION RESERVED FOR CDAY

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/28/2011	0001	39			#		
Cadmium	mg/L	06/28/2011	0001	0.00022		J	#	0.000058	
Molybdenum	mg/L	06/28/2011	0001	0.00037	B		#	0.00016	
Selenium	mg/L	06/28/2011	0001	0.00015			#	0.000032	
Uranium	mg/L	06/28/2011	0001	0.00032			#	0.000015	
Oxidation Reduction Potential	mV	06/28/2011	N001	-103.7			#		
pH	s.u.	06/28/2011	N001	7.34			#		
Specific Conductance	umhos/cm	06/28/2011	N001	260			#		
Temperature	C	06/28/2011	N001	15.77			#		
Turbidity	NTU	06/28/2011	N001	24.9			#		

Surface Water Quality Data by Location (USEE102) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 8/12/2011
Location: 0656 SURFACE LOCATION RESERVED FOR CDAY

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/28/2011	0001	35			#		
Cadmium	mg/L	06/28/2011	0001	0.0003		J	#	0.000058	
Molybdenum	mg/L	06/28/2011	0001	0.00026	B		#	0.00016	
Selenium	mg/L	06/28/2011	0001	0.00018			#	0.000032	
Uranium	mg/L	06/28/2011	0001	0.00021			#	0.000015	
Oxidation Reduction Potential	mV	06/28/2011	N001	-141			#		
pH	s.u.	06/28/2011	N001	7.33			#		
Specific Conductance	umhos/cm	06/28/2011	N001	245			#		
Temperature	C	06/28/2011	N001	21.44			#		
Turbidity	NTU	06/28/2011	N001	23.5			#		

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.

Equipment Blank Data

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BLANKS REPORT

LAB: PARAGON/ALS LABORATORY GROUP (Fort Collins, CO)
RIN: 11063904
Report Date: 8/12/2011

Parameter	Site Code	Location ID	Sample Date	Sample ID	Units	Result	Qualifiers Lab	Qualifiers Data	Detection Limit	Uncertainty	Sample Type
Cadmium	DUR01	0999	06/28/2011	N001	mg/L	0.00012	B		0.000058		E
Molybdenum	DUR01	0999	06/28/2011	N001	mg/L	0.00016	U		0.00016		E
Selenium	DUR01	0999	06/28/2011	N001	mg/L	0.000089	B	U	0.000032		E
Uranium	DUR01	0999	06/28/2011	N001	mg/L	0.00003	B		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.

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Static Water Level Data

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STATIC WATER LEVELS (USEE700) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/12/2011

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)
0612	D	6500.94	06/28/2011	09:45:03	39.99	6460.95
0617	D	6498.11	06/28/2011	11:15:06	28.53	6469.58
0630	D	6494.44	06/28/2011	10:30:50	31.82	6462.62
0631	D	6477.91	06/28/2011	11:45:51	7.51	6470.4
0633	D	6481.81	06/28/2011	12:05:41	9.78	6472.03
0634	D	6491.75	06/28/2011	12:30:42	13.65	6478.1
0635	D	6497.68	06/28/2011	07:45:00	13.73	6483.95
0863		6513.32	06/28/2011	09:10:59	55.85	6457.47

STATIC WATER LEVELS (USEE700) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 8/12/2011

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)
0594	O	6472.49	06/28/2011	15:10:19	21.05	6451.44
0598	O	6479.09	06/29/2011	09:50:47	22.71	6456.38
0607	U	6527.95	06/29/2011	08:35:45	50.81	6477.14
0884		6476.37	06/28/2011	16:20:43	17.6	6458.77

STATIC WATER LEVELS (USEE700) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/12/2011

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)
0605	U	7189.6	06/27/2011	17:40:06	38.56	7151.04
0607	D	7099.1	06/27/2011	18:45:28	42.22	7056.88
0608	D	7035	06/27/2011	15:40:27	36.56	6998.44
0612	D	7109.8	06/27/2011	18:10:56	95.39	7014.41
0618	D	7036.41	06/27/2011	15:15:13	38.6	6997.81
0621	U	7035.77	06/27/2011	16:05:58	51.76	6984.01
0623	U	7048.67	06/27/2011	16:45:39	34.98	7013.69

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

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Time-Concentration Graphs
Durango Disposal Site

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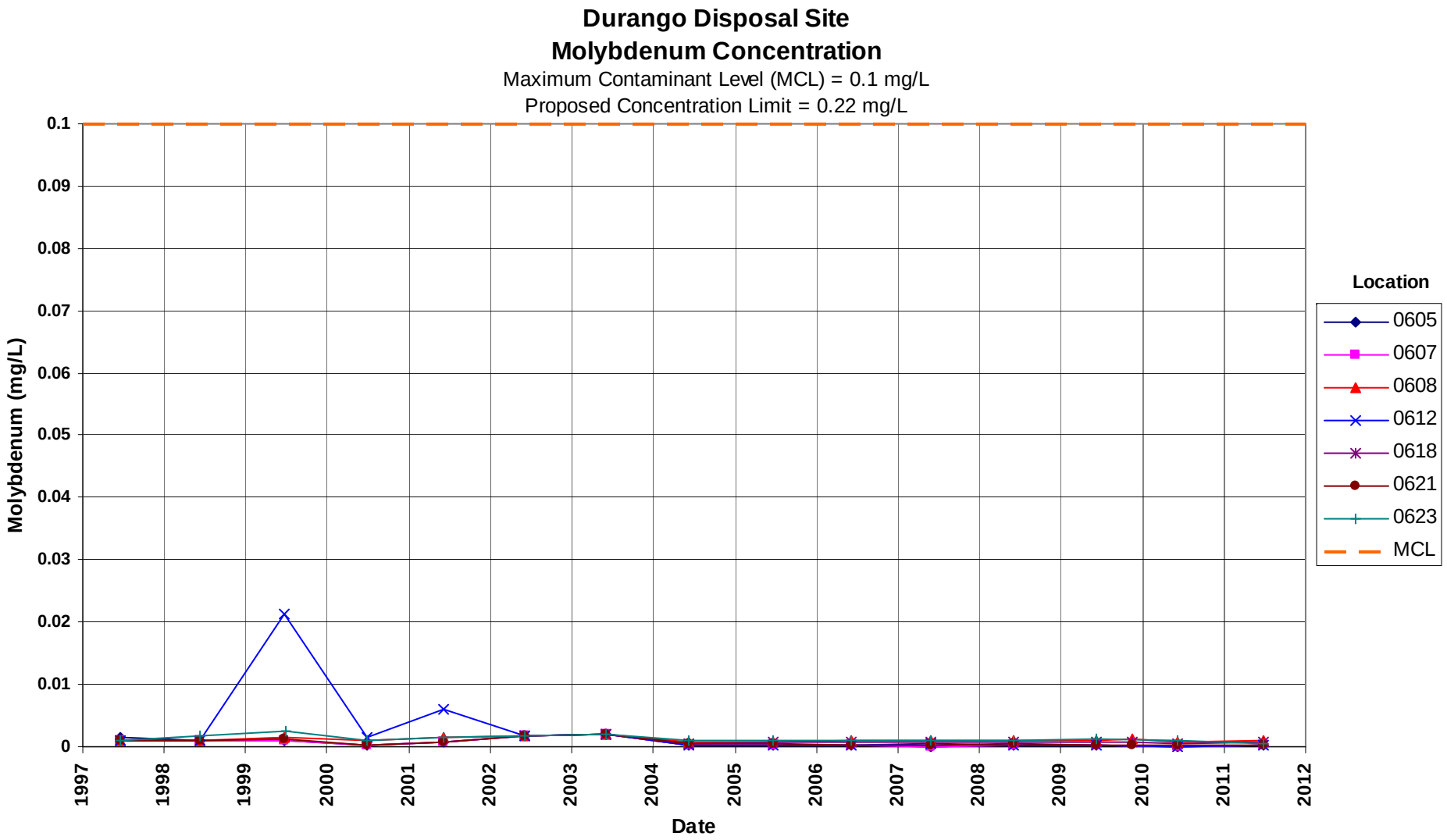
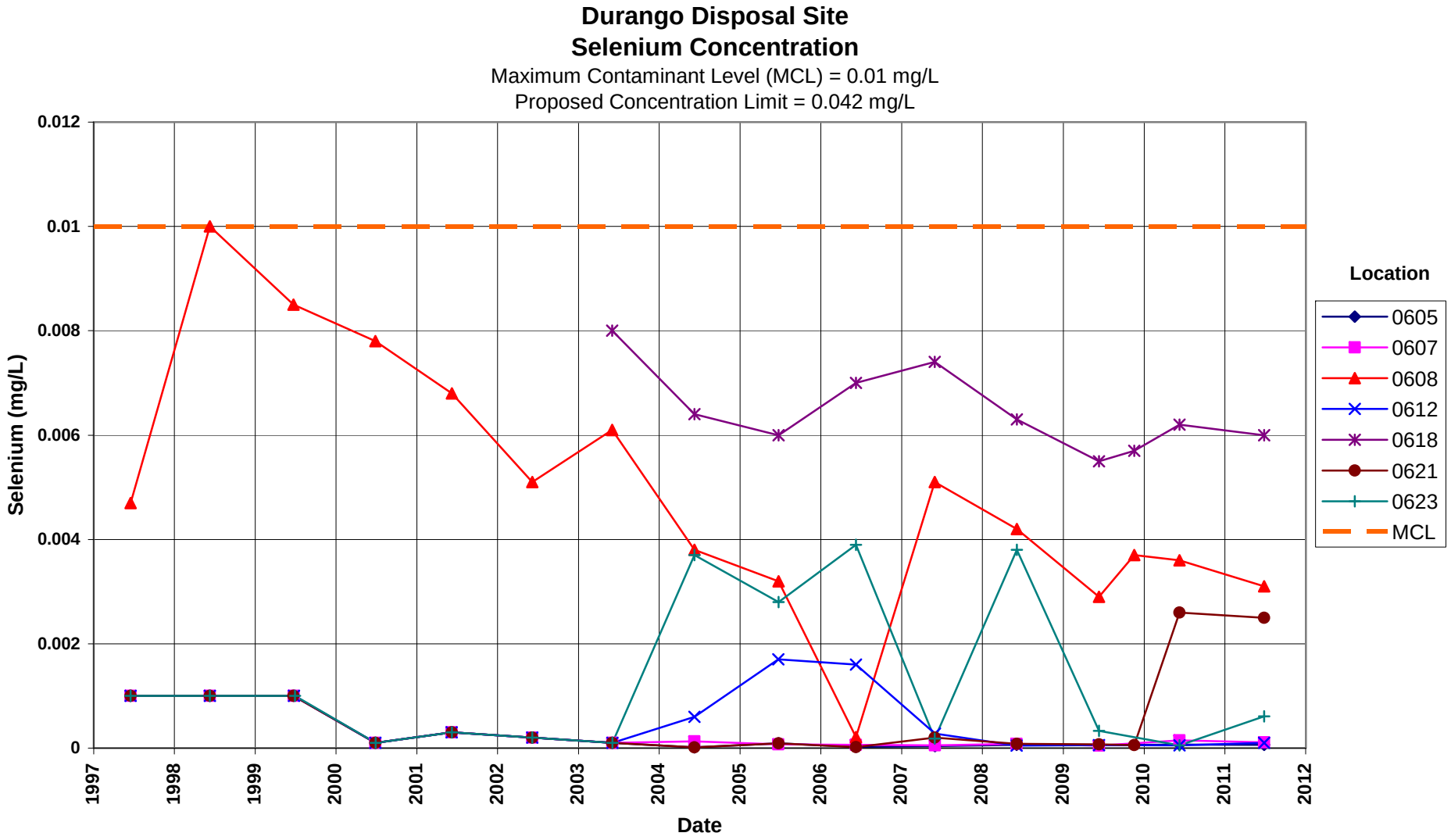
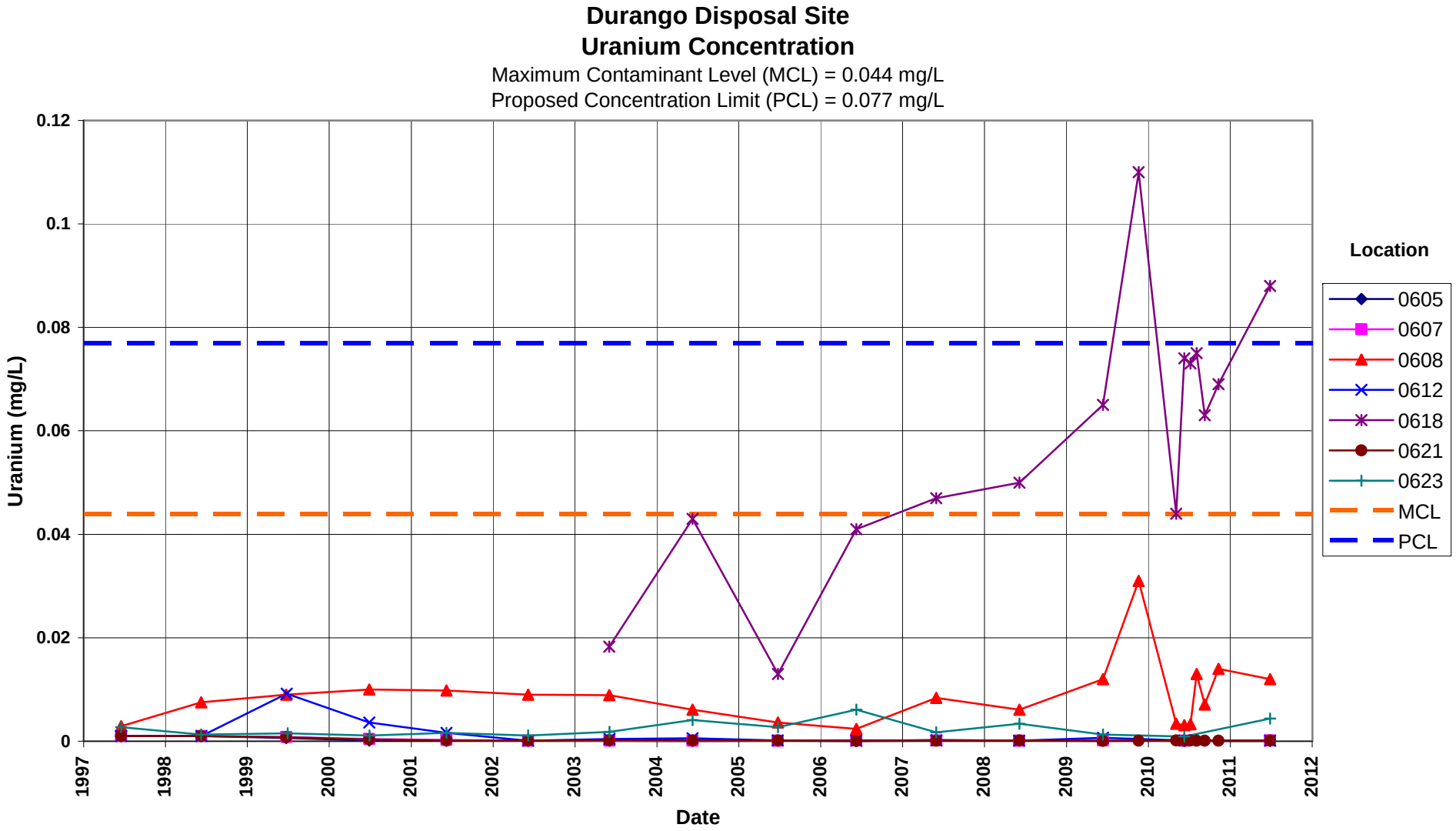

Durango Disposal Site
Molybdenum Concentration
Maximum Contaminant Level (MCL) = 0.1 mg/L
Proposed Concentration Limit = 0.22 mg/L
Molybdenum (mg/L)
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
Date
Location
0605
0607
0608
0612
0618
0621
0623
MCL


Durango Disposal Site
Selenium Concentration
Maximum Contaminant Level (MCL) = 0.01 mg/L
Proposed Concentration Limit = 0.042 mg/L
Selenium (mg/L)
0.012
0.01
0.008
0.006
0.004
0.002
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
Date
Location
0605
0607
0608
0612
0618
0621
0623
MCL


Durango Disposal Site
Uranium Concentration
Maximum Contaminant Level (MCL) = 0.044 mg/L
Proposed Concentration Limit (PCL) = 0.077 mg/L
Uranium (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
2012
Date
Location
0605
0607
0608
0612
0618
0621
0623
MCL
PCL

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Time-Concentration Graphs
Durango Processing Site

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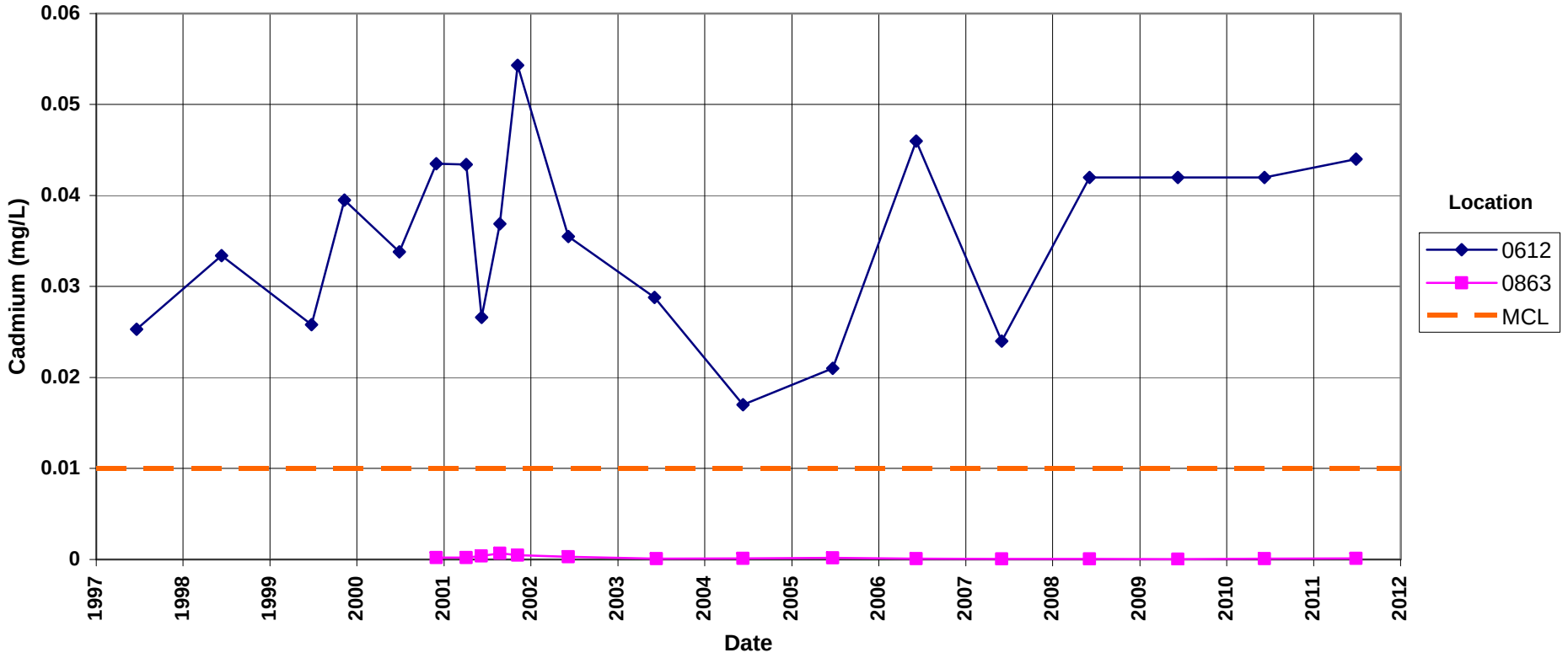
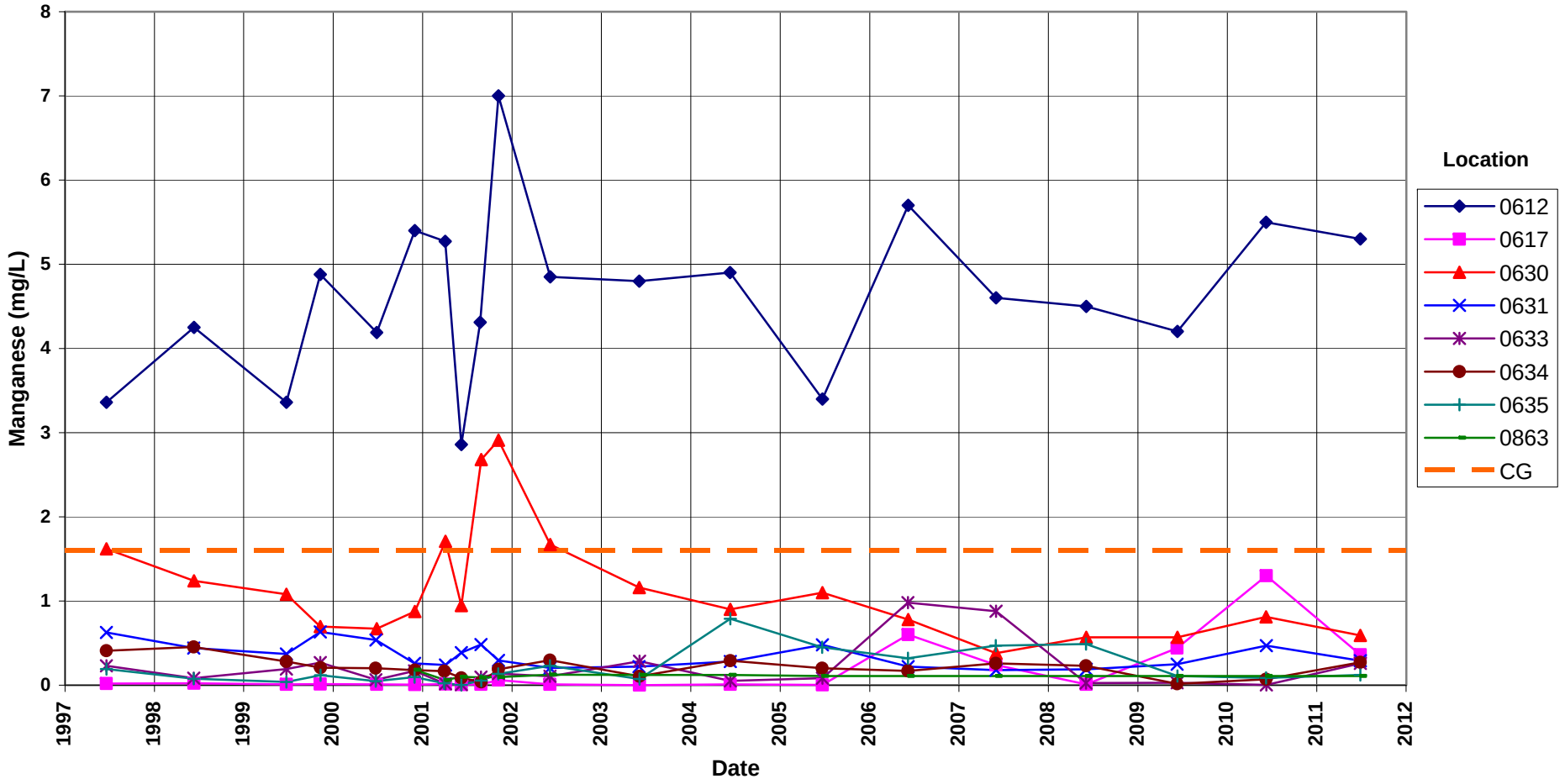
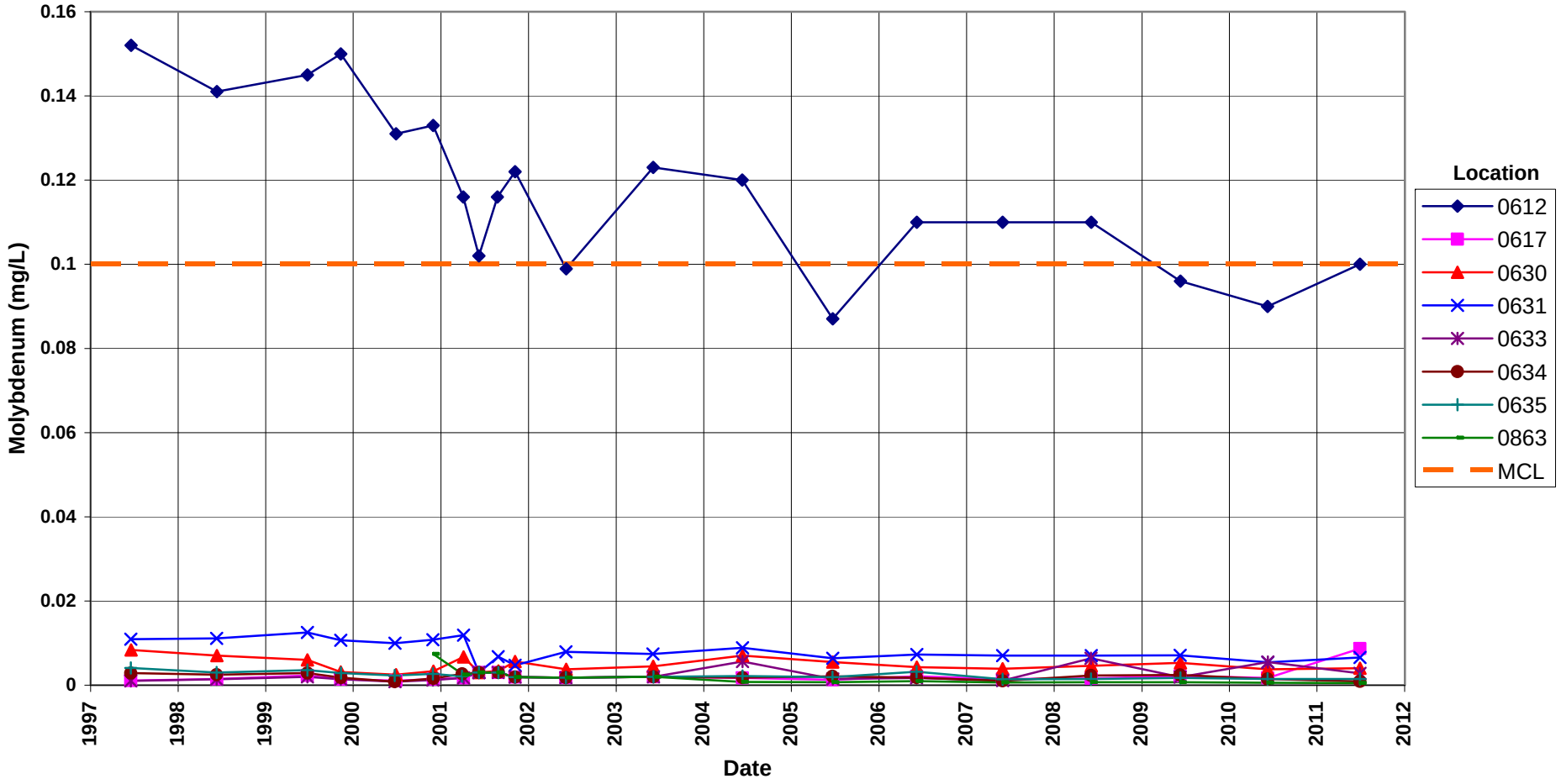
Durango Mill Tailings Process Site
Cadmium Concentration
Maximum Contaminant Level (MCL) = 0.01 mg/L



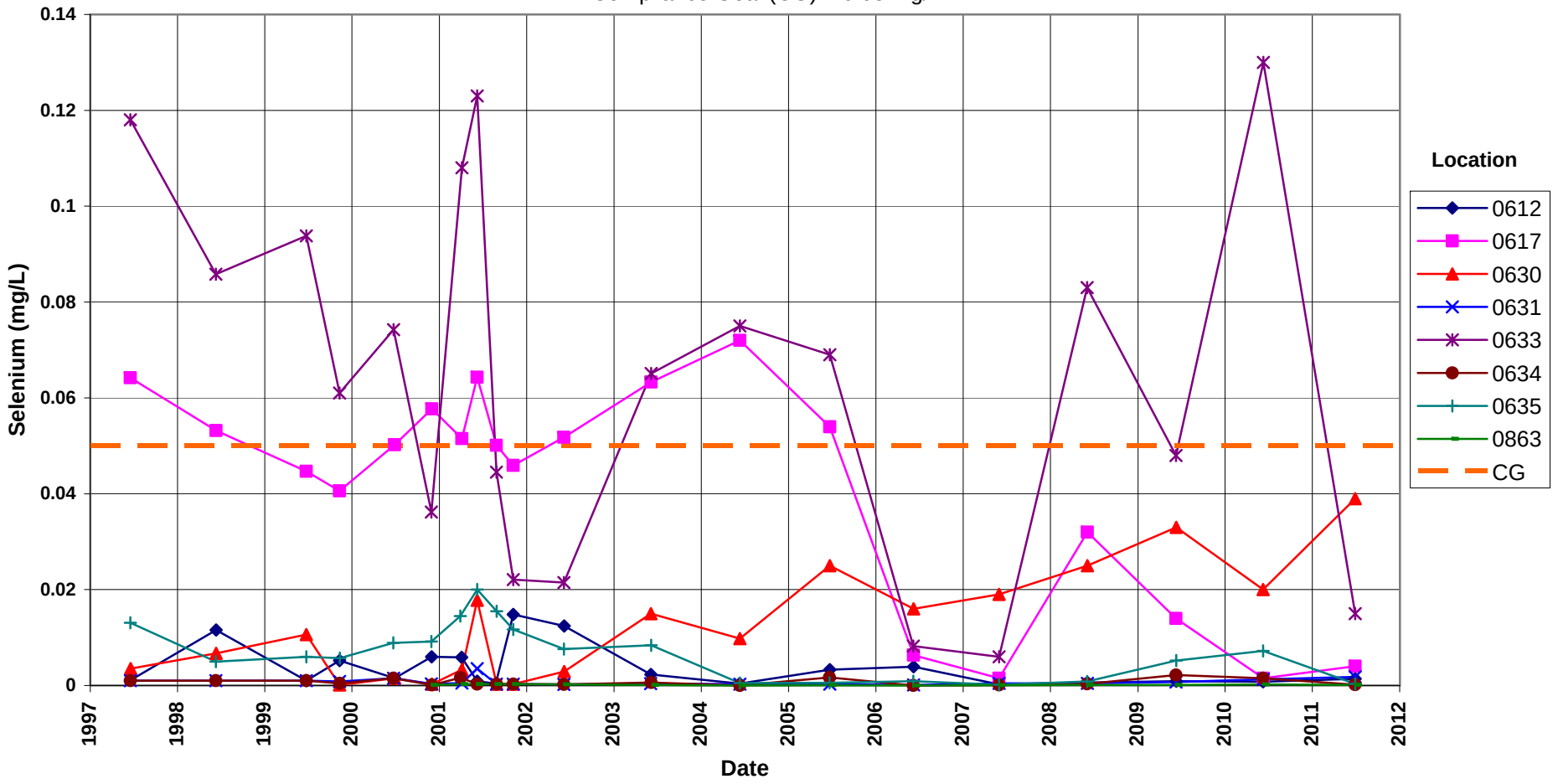
Durango Mill Tailings Process Site
Manganese Concentration
Compliance Goal (CG) = 1.6 mg/L



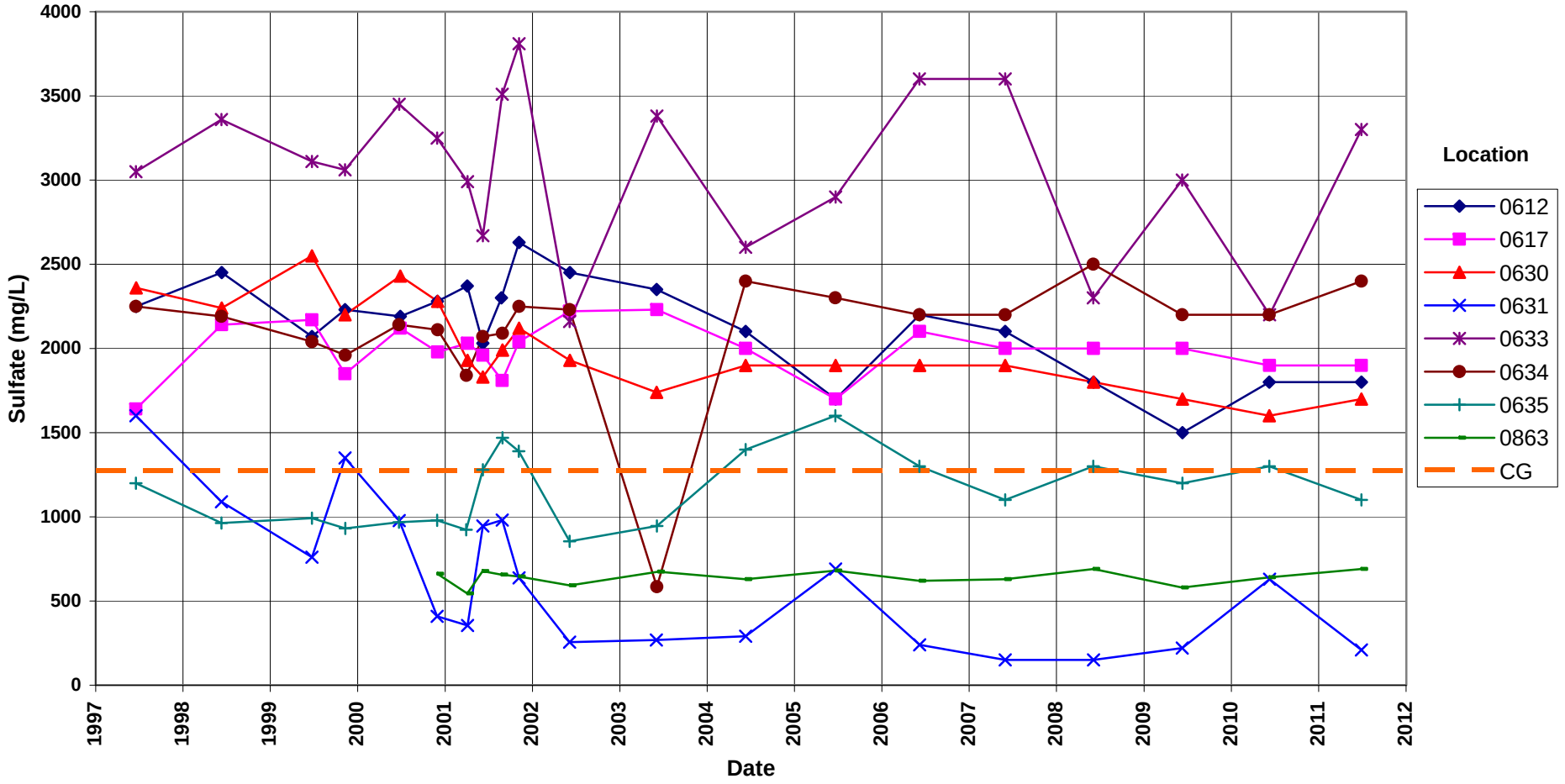
Durango Mill Tailings Process Site
Molybdenum Concentration
Maximum Contaminant Level (MCL) = 0.1 mg/L



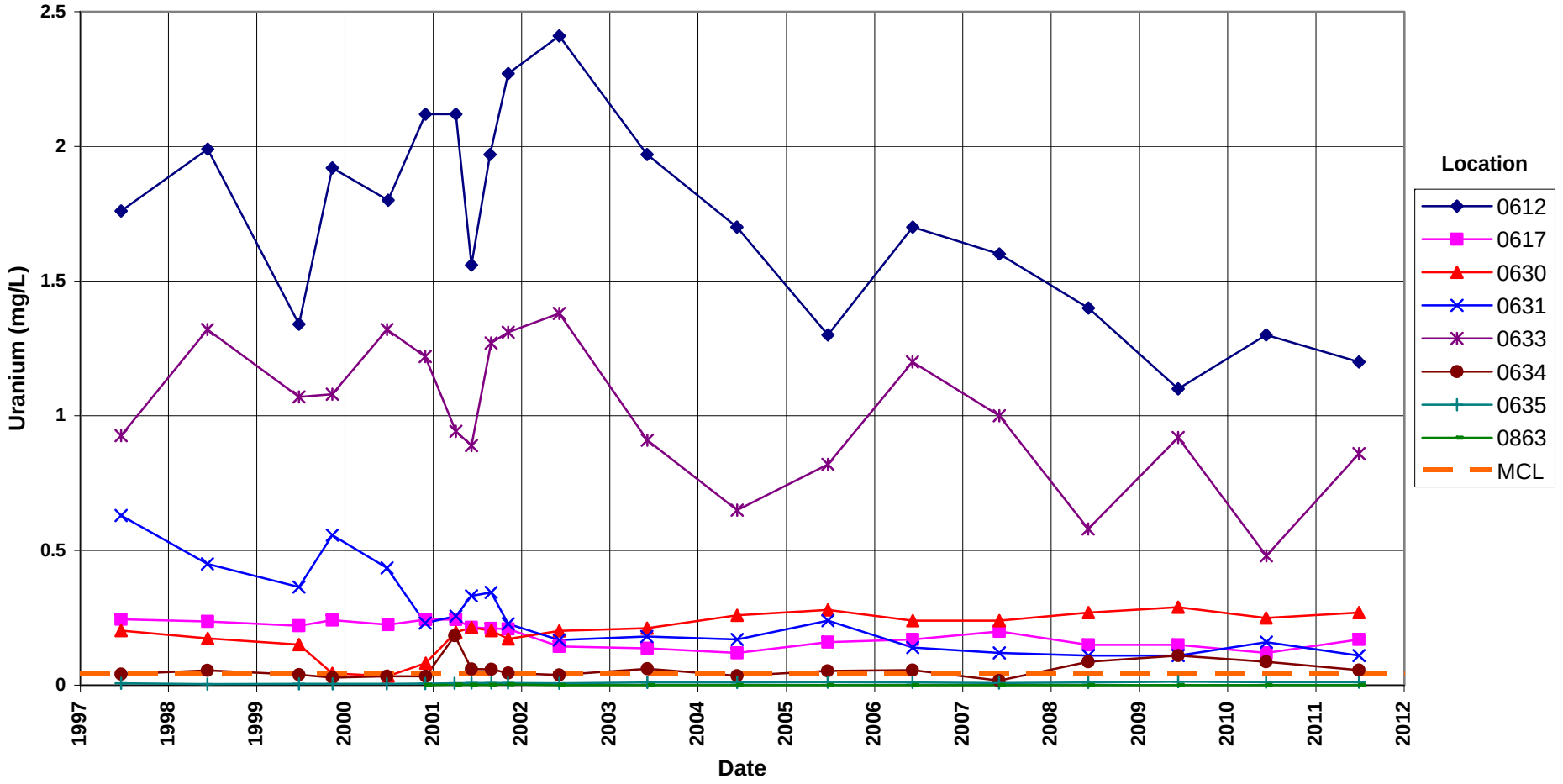
Durango Mill Tailings Process Site
Selenium Concentration
Maximum Contaminant Level (MCL) = 0.01 mg/L
Compliance Goal (CG) = 0.05 mg/L

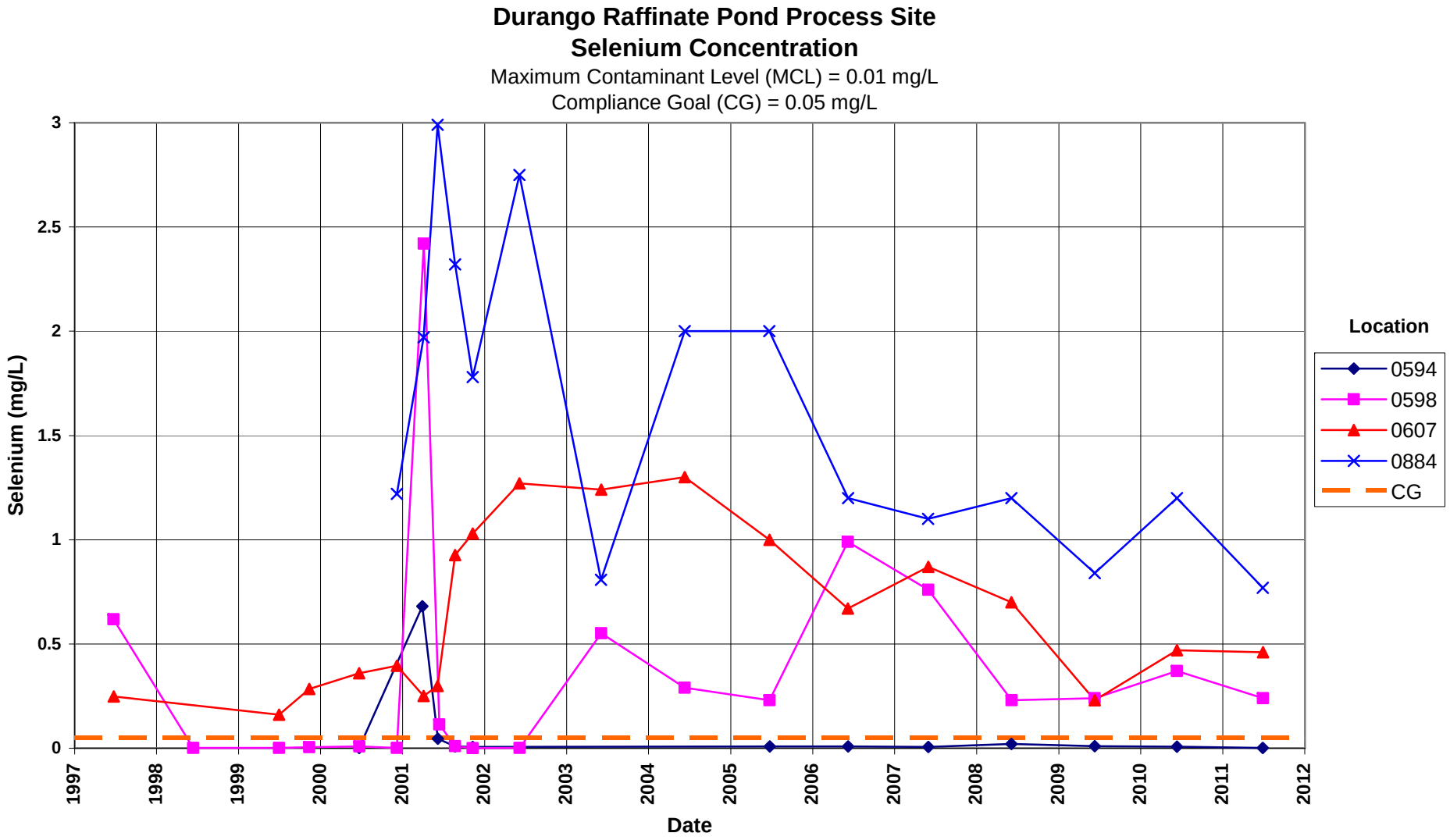


Durango Mill Tailings Process Site
Sulfate Concentration
Compliance Goal (CG) = 1276 mg/L

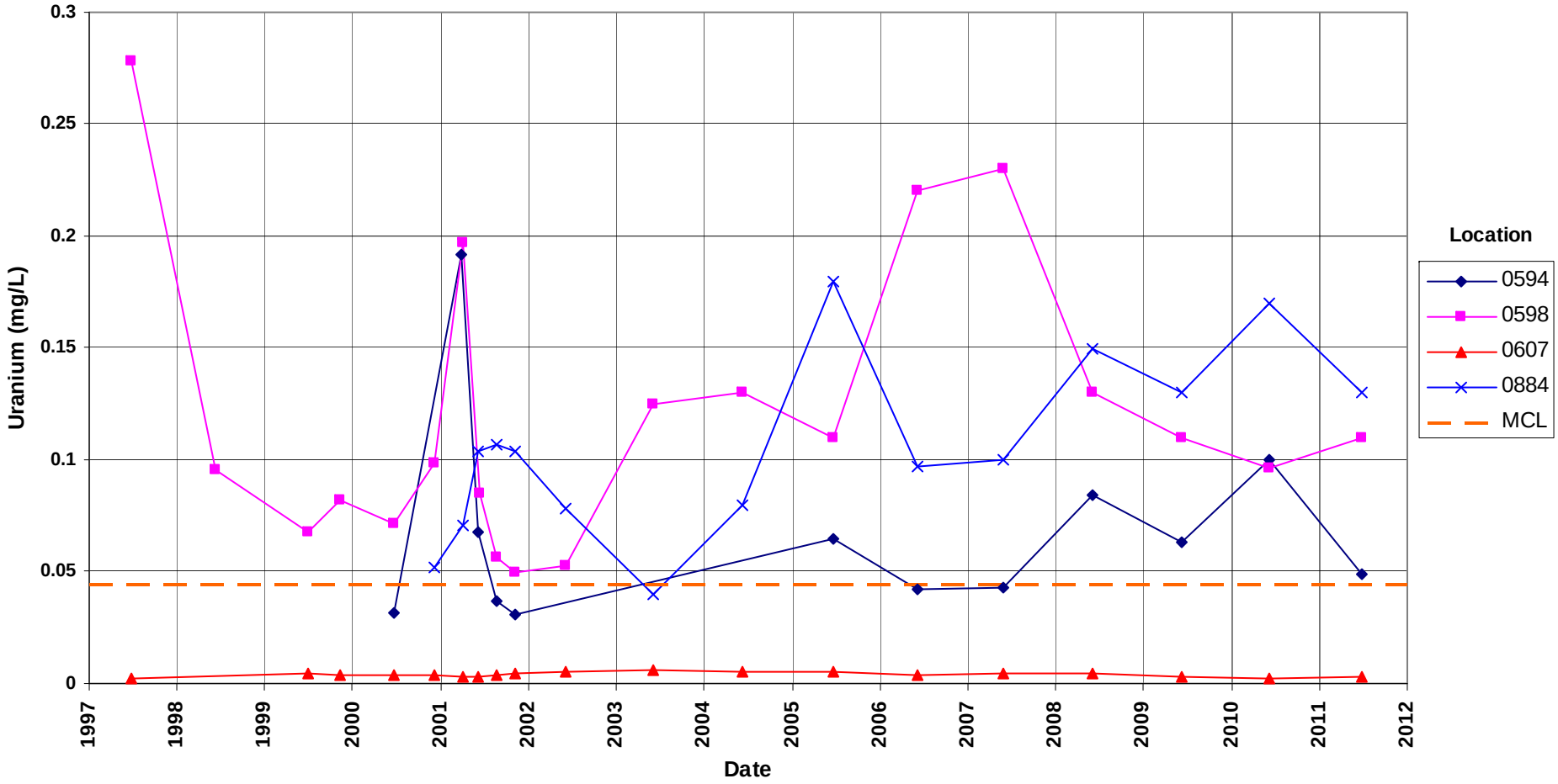


Durango Mill Tailings Process Site
Uranium Concentration
Maximum Contaminant Level (MCL) = 0.044 mg/L




Durango Raffinate Pond Process Site
Selenium Concentration
Maximum Contaminant Level (MCL) = 0.01 mg/L
Compliance Goal (CG) = 0.05 mg/L
Selenium (mg/L)
3
2.5
2
1.5
1
0.5
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
Date
Location
0594
0598
0607
0884
CG

Durango Raffinate Pond Process Site
Uranium Concentration
Maximum Contaminant Level = 0.044 mg/L



Attachment 3
Sampling and Analysis Work Order

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Task Order LM00-501
Control Number 11-0680

May 24, 2011

U.S. Department of Energy
Office of Legacy Management
ATTN: Joseph Desormeau
Site Manager
11025 Dover St., Ste. 1000
Westminster, CO 80021

SUBJECT: Contract No. DE-AM01-07LM00060, S.M. Stoller Corporation (Stoller)
June 2011 Environmental Sampling at Durango, Colorado

REFERENCE: Task Order LM-501-02-104-402, Durango, CO, Processing and Disposal Sites

Dear Mr. Desormeau:

The purpose of this letter is to inform you of the upcoming sampling at Durango, CO. Enclosed are the maps and tables specifying sample locations and analytes for monitoring at the Durango, CO, Processing and Disposal Sites. Water quality data will be collected from monitoring wells and surface water locations at these sites as part of the routine environmental sampling currently scheduled to begin the week of June 27, 2011.

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

Monitoring Wells*

DUR01 Mill Site

612 Al/Km	630 Al/Km	631 Al/Km	633 Km	634 Km	635 Km	863 Al
617 Al						

DUR02 Raffinate Pond

594 Mf	598 Mf/Pl	607 Al	879 Mf	884 Al		

DUR03 Bodo Canyon

605 Cf	607 Cf	608 Al	612 Km	618 Al	621 Cf	623 Al

*NOTE: Al = Alluvium; Cf = Cliff House Formation; Km = Mancos Shale; Mf = Menefee Formation; Pl = Point Lookout Formation

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

Surface Locations

DUR01

584	586	652	691

DUR02

588	654	656

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) 248-6652 if you have any questions.

Sincerely,

David Miller
Site Lead

DM/lcg/lb

Enclosures (3)

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

Sampling Frequencies for Locations at Durango, Colorado

Location ID	Quarterly	Semiannually	Annually	Biennially	Not Sampled	Notes
Monitoring Wells						
DUR01 Mill Tailings						
612			X			
617			X			
630			X			
631			X			Download datalogger
633			X			Download datalogger
634			X			
635			X			
859					X	Download datalogger
863			X			Download datalogger
DUR02 Raffinate Pond						
594			X			Se and U ONLY
596					X	Download datalogger
598			X			Se and U ONLY
607			X			Se and U ONLY
879			X			Se and U ONLY
884			X			Se and U ONLY
888					X	Download datalogger
889					X	Download datalogger
890					X	Download datalogger
DUR03 Bodo Canyon						
605			X			
607			X			POC WELL
608			X			"
612			X			"
618			X			"; supplements 608
621			X			"
623			X			BACKGROUND
MW-1					X	Download datalogger
NVP					X	Download datalogger
P7					X	Download datalogger
Surface Locations						
DUR01 Mill Tailings						
584			X			
586			X			
652			X			RIVER
691			X			RIVER
DUR02 Raffinate Pond						
588			X			
654			X			RIVER
656			X			

Sampling conducted in June

Constituent Sampling Breakdown

Site	Durango				
Analyte	Groundwater	Surface Water	Required Detection Limit (mg/L)	Analytical Method	Line Item Code
Approx. No. Samples/yr	20	7			
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)					
Cadmium	0612 & 0863 only	X	0.001	SW-846 6020	LMM-02
Calcium	DUR03 only		5	SW-846 6010	LMM-01
Chloride	DUR03 only		0.5	SW-846 9056	MIS-A-039
Chromium					
Gross Alpha					
Gross Beta					
Iron	DUR03 only		0.1	SW-846 6020	LMM-01
Lead					
Magnesium	DUR03 only		5	SW-846 6010	LMM-01
Manganese	All Mill Tailings Areas and Bodo Canyon locations		0.005	SW-846 6010	LMM-01
Molybdenum	All Mill Tailings Areas and Bodo Canyon locations	X	0.003	SW-846 6020	LMM-02
Nickel					
Nickel-63					
Nitrate + Nitrite as N (NO3+NO2)-N					
Potassium	DUR03 only		1	SW-846 6010	LMM-01
Radium-226					
Radium-228					
Selenium	X	X	0.0001	SW-846 6020	LMM-02
Silica					
Sodium	DUR03 only		1	SW-846 6010	LMM-01
Strontium					
Sulfate	All Mill Tailings Areas and Bodo Canyon locations		0.5	SW-846 9056	MIS-A-044
Sulfide					
Total Dissolved Solids	DUR03 only		10	SM2540 C	WCH-A-033
Uranium	X	X	0.0001	SW-846 6020	LMM-02
Vanadium					
Zinc					
Total No. of Analytes	13	4			

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

Attachment 4
Trip Report

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Memorandum

DATE: July 6, 2011

TO: David Miller

FROM: Gretchen Baer

SUBJECT: Trip Report

Site: Durango, Colorado, Processing and Disposal Sites, including Durango Treatment System Sampling.

Dates of Sampling Event: June 27-29, 2011

Team Members: Gretchen Baer and Kent Moe
Present on June 28 to observe sampling at well DUR01-0630: Joe Desormeau (DOE), Deb Steckley (DOE), Jeremy Joseph (DOE), and Marilyn Kastens (Stoller). A copy of the JSA signed by the four observers is available in \\Condor\sms\11063904.

Number of Locations Sampled: Samples were collected from 26 of the 27 locations identified on the sampling notification letter as follows:

	Locations Sampled	Planned Locations
Mill Tailings Site, DUR01	8 wells, 4 surface water	8 wells, 4 surface water
Raffinate Pond Site, DUR02	4 wells, 3 surface water	5 wells, 3 surface water
Bodo Canyon Site, DUR03	7 wells	7 wells

Splits for uranium analysis were collected at the Treatment System (DUR03 locations 0608, 0618, and 0621) for the Environmental Sciences Laboratory (ESL). These split samples were created by collecting metals samples in 1-liter bottles, then acidifying, then splitting into 2 500-mL bottles.

Locations Not Sampled/Reason: On June 29, 2011, DUR02-0879 was damaged by a Weminuche backhoe operator while cleaning out mud from the flooded pit where the well is located ~2 feet below grade. (See photos and further discussion, below).

Location Specific Information:

Site	Location IDs	Comments
DUR01	0584 0586 0652 0691	Surface water was field-filtered (turbidity >10 NTU).
DUR02	0654 0656	
DUR01	0586	Surface water was collected from east bank, rather than from west bank, as indicated on map.
DUR01	0631	Dark clumps early in purge.
DUR01	0635	Rusty clumps early in purge.
DUR01	0634	Cat II
DUR02	0594 0607	
DUR03	0605 0612	
DUR02	0594	HEX KEY is needed to open well cover.
DUR02	0607	Well casing is bent.
DUR02	0879	Well not sampled due to broken casing.
DUR02	0884	The initial WL of 17.60' was measured from the top of the INNER PVC casing. Not sure whether to take it from the inner or outer casing. The outer casing was measured as 2.07' above the inner casing.
DUR03	0605 0607 0612	Sulfur odor. 0612 has a very high alkalinity value.
DUR03	0621	pH slow to stabilize; settles out at < 5.
DUR03	0623	Cat III. Could not get air tank to the well to sample with bladder pump. Pulled the bladder pump to bail. Replaced bladder pump when done. Turbidity was <10NTU.

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

False ID	True ID	Sample Type	Associated Matrix
2170	Associated with DUR01 0584, 0586, 0652, 0691, DUR02 0654, 0656	Equipment Blank	Water
2171	DUR01 0612	Duplicate	Groundwater
2172	DUR02 0884	Duplicate	Groundwater
2173	DUR03 0618	Duplicate	Groundwater

Report Identification Number (RIN) Assigned: 11063904. Field data sheets can be found in \\Condor\sms\11063904 in the Field Data folder. RIN 11063907 was assigned to the treatment system samples collected for the ESL.

Sample Shipment: RIN 11063904 samples were shipped from Grand Junction to ALS Laboratory Group on June 30, 2011. RIN 11063907 samples were hand-delivered to the ESL on June 30, 2011.

Water Level Measurements: Water level measurements were collected at all sampled wells. Data loggers were not downloaded during this event.

Well Inspection Summary: All wells were in good condition with two exceptions:
Well DUR02 0607 is bent and is too high above the current surface level.
Well DUR02 0879 was damaged on 6/29/11 as described below.

Field Variance: DUR01 0586–Surface water was collected from the east bank of the river, rather than from the west bank, as indicated on the sampling map. Sample was taken below the treatment system outfall.

Equipment: All equipment functioned properly. All wells were sampled using the low-flow procedure. Wells were sampled with a peristaltic pump and dedicated tubing, a dedicated bladder pump, or a disposable bailer. Surface waters were sampled using a peristaltic pump and dedicated tubing or a peristaltic pump and tubing reel. An equipment blank was collected after decontamination of the tubing reel. All other equipment was dedicated or disposable.

Institutional Controls

Fences, Gates, Locks: All gates were appropriately closed and locked during the sampling event. The 3359 key worked in a lock that is "daisy-chained" on the gate for the dog park. Key #0356 is used for the Bureau of Reclamation well DUR02 0598.
Signs: No issues observed.
Trespassing/Site Disturbances: None observed.

Site Issues:

Disposal Cell/Drainage Structure Integrity: No issues observed.
Vegetation/Noxious Weed Concerns: No issues observed.
Maintenance Requirements:

1. Well DUR02 0607 needs to be straightened and modified to the current surface level.
2. Well DUR02 0879 was damaged on June 29, 2011:

On the afternoon of June 28, 2011, the samplers saw that well DUR02 0879 was under water, which had collected because the flush-mounted well is in a low area surrounded by concrete barriers ~2 feet below grade. The samplers informed D. Miller via phone.


Standing water at well 0879 on 6/28/11


Well 0879 on 6/28/11

Weminuche personnel offered to pump out the standing water the next morning. While the samplers were sampling well DUR02 0607 on the morning of June 29, 2011, Weminuche pumped the water out. A Weminuche operator then used a backhoe to scoop mud out of the pit but damaged the well with the backhoe by breaking the casing. A Bureau of Reclamation employee, who was observing the work at 0879, then drove to well 0607 to tell the samplers. The samplers informed D. Miller via phone and taped over the end of the exposed casing.

Well 0879 on 6/29/11 after damage to casing

Safety Issues: None identified.

Access Issues:

- Samplers called Durango police dispatch @ 970-385-2900 prior to arriving at the Durango Mill Tailings site (DUR01, aka “the dog park”) to let them know about sampling activities.
- Bureau of Reclamation personnel are available in an office trailer just below well DUR02 0607 if help is needed accessing wells 0598 or 0879.

Corrective Action Required/Taken: None.

(GB/lb)

cc: (electronic)
Jalena Dayvault, DOE
Keith Miller, Stoller
Steve Donivan, Stoller
EDD Delivery
File: GRN 410.02(A)