Data Validation Package

February 2013
Groundwater and Surface Water Sampling at the Grand Junction, Colorado, Site

April 2013

U.S. DEPARTMENT OF ENERGY | Legacy Management

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Contents

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Sampling Event Summary

Site: Grand Junction, Colorado, Site

Sampling Period: February 6–14, 2013

This event consisted of sampling seven monitoring wells and six surface water locations at the Grand Junction, Colorado, Site (Grand Junction site). Long-term monitoring at the Grand Junction site is prescribed in the 2006 *Long-Term Surveillance and Maintenance Plan for the Grand Junction, Colorado, Site*. Groundwater and surface water samples were analyzed for manganese (groundwater only), molybdenum, selenium, sulfate, and uranium. These constituents were selected on the basis of historical data and consideration of groundwater standards (molybdenum, selenium, and uranium), secondary drinking water standards (sulfate and manganese), human health risk (manganese), and Colorado Department of Public Health and the Environment input.

Although groundwater quality at the Grand Junction site has improved, analyte concentrations in the alluvial aquifer still exceed U.S. Environmental Protection Agency (EPA) groundwater standards (40 CFR 192), with the uranium standard equaled or exceeded in all seven of the wells in the monitoring network (Table 1).

Table 1. Locations with Samples that Equaled or Exceeded EPA Groundwater Standards in February 2013

Analyte	Standard [a]	Groundwater		Surface Water	
		Location	Concentration	Location	Concentration
Molybdenum	0.1	14-13NA 8-4S	0.10 0.14	Wetland Area	1.3
Selenium	0.01	6-2N 8-4S GJ01-01	0.029 0.017 0.032	-------	-------
Uranium	0.044	10-19N 11-1S 14-13NA 6-2N 8-4S GJ01-01 GJ84-04	0.13 0.052 0.27 0.061 0.49 0.30 0.24	North Pond South Pond Wetland Area	0.15 0.31 5.4

[a] Standards are listed in 40 CFR 192.02 Table 1 to Subpart A; concentrations are in milligrams per liter (mg/L).

Surface water features located at the Grand Junction site, which include the North Pond, the South Pond, and the Wetland Area, receive discharge of contaminated alluvial groundwater; therefore, elevated concentrations of groundwater contaminants are expected in the these ponds. Because these locations are recharged by groundwater, results from these locations were evaluated by comparing them to groundwater standards. Surface water locations with sample concentrations that exceeded groundwater standards are listed in Table 1. The Wetland Area molybdenum and uranium concentrations are the historical maximum values for this location.

Surface water results from Gunnison River locations adjacent to and downstream of the site were compared to statistical benchmark values derived using historical data from the Upper Gunnison sampling location, which is located upstream of the site on the Gunnison River. As shown in Table 2, no benchmark values were exceeded during this event, which indicates that the site is having no measurable impact on river water quality.

Table 2. Comparison of Gunnison River Concentrations to Benchmarks

Analyte	Benchmark [a] (mg/L)	2013 Upper Mid Gunnison Concentration (mg/L)	2013 Lower Gunnison Concentration (mg/L)
Molybdenum	0.0053	0.0026	0.0026
Selenium	0.0148	0.0061	0.0056
Sulfate	542	400	400
Uranium	0.0115	0.0080	0.0082

[a] Results from 1996–present were used to calculate benchmark values.

Sampling results indicate that natural flushing is progressing with analyte concentrations generally declining as shown in the time-concentration graphs, included in the Data Presentation section.

Sam Campbell
Site Lead, S.M. Stoller Corporation

4/11/2013
Date

Grand Junction Site, Sample Location Map

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Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	Grand Junction, Colorado	**Date(s) of Water Sampling**	February 6–14, 2013
Date(s) of Verification	March 15, 2013	**Name of Verifier**	Stephen Donivan

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures?	Yes	
List any Program Directives or other documents, SOPs, instructions.		Work Order letter dated February 5, 2013.
2. Were the sampling locations specified in the planning documents sampled?	Yes	
3. Were calibrations conducted as specified in the above-named documents?	Yes	
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. Were wells categorized correctly?	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	

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	All wells were Category I.
Was one pump/tubing volume removed prior to sampling?		
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	A duplicate sample was collected from location 14-13NA.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with non-dedicated equipment?	Yes	One equipment blank was collected.
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were the true identities of the QC samples documented?	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. Was all pertinent information documented on the field data sheets?	Yes	
18. Was the presence or absence of ice in the cooler documented at every sample location?	Yes	
19. Were water levels measured at the locations specified in the planning documents?	Yes	

Laboratory Performance Assessment

General Information

Report Number (RIN):	13025100
Sample Event:	February 6–14, 2013
Site(s):	Grand Junction, Colorado
Laboratory:	ALS Laboratory Group, Fort Collins, Colorado
Work Order No.:	1302232
Analysis:	Metals and Wet Chemistry
Validator:	Stephen Donivan
Review Date:	March 15, 2013

This validation was performed according to the *Environmental Procedures Catalog*, (LMS/POL/S04325, continually updated) *"Standard Practice for Validation of Environmental 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 3.

Table 3. Analytes and Methods

Analyte	Line Item Code	Prep Method	Analytical Method
Manganese	LMM-01	SW-846 3005A	SW-846 6010B
Molybdenum	LMM-02	SW-846 3005A	SW-846 6020A
Selenium	LMM-02	SW-846 3005A	SW-846 6020A
Sulfate	MIS-A-044	SW-846 9056	SW-846 9056
Uranium	LMM-02	SW-846 3005A	SW-846 6020A

Data Qualifier Summary

None of the analytical results required qualification.

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received 15 water samples on February 20, 2013, accompanied by a Chain of Custody (COC) form. A copy of the air bill was included in the receiving documentation. The COC 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 COC form was complete with no errors or omissions.

Preservation and Holding Times

The sample shipment was received intact with the temperature inside the iced cooler at 0.2 °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.

Detection and Quantitation Limits

The method detection limit (MDL) was reported for all analytes as required. The MDL, as defined in 40 CFR 136, is the minimum concentration of an analyte that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero. The practical quantitation limit (PQL) for these analytes is the lowest concentration that can be reliably measured, and is defined as 5 times the MDL.

The reported MDLs for all analytes demonstrate compliance with contractual requirements.

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, Manganese

Calibrations were performed on February 22, 2013, using three calibration standards. The correlation coefficient value was greater than 0.995. The absolute value of the intercept was only slightly above 3 times the MDL, which is acceptable. Initial and continuing calibration verification checks were made at the required frequency with all calibration checks meeting 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.

Method SW-846 6020A, Molybdenum, Selenium, and Uranium

Calibrations were performed on February 25, 2013, 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 MDL. Initial and continuing calibration verification checks were made at the required frequency with all calibration checks associated with the samples meeting 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, Sulfate

Calibrations were performed on February 21, 2013, using five 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 MDL. Initial and continuing calibration verification checks were made at the required frequency with all calibration checks meeting the acceptance criteria.

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 blank results associated with the samples were below the PQLs for all analytes.

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 spike recoveries met the recovery and precision criteria for all analytes evaluated.

Laboratory Replicate Analysis

Laboratory replicate analyses are used to determine laboratory precision. The relative percent difference for replicate results that are greater than 5 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. Serial dilution data are evaluated when the concentration of the undiluted sample is greater than 50 times the MDL. All evaluated serial dilution data were acceptable.

Completeness

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

Chromatography Peak Integration

The integration of analytes peaks was reviewed for all sulfate data. There were no manual integrations performed for sulfate and all peak integrations were satisfactory.

Electronic Data Deliverable (EDD) File

The EDD file arrived on March 1, 2013. 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: 13025100 **Lab Code:** PAR **Validator:** Stephen Donivan **Validation Date:** 03/15/2013

Project: Grand Junction Office(GJO) **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: 13025100 **Lab Code:** PAR **Date Due:** 03/20/2013

Matrix: Water **Site Code:** GJO01 **Date Completed:** 03/04/2013

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	CCV	CCB								
Manganese	ICP/ES	02/22/2013	0.0000	1.0000	OK	OK	OK	99.0	93.0	93.0	0.0	101.0	6.0	104.0
Manganese	ICP/ES	02/22/2013									2.0	95.0		104.0
Molybdenum	ICP/MS	02/25/2013	0.0000	1.0000	OK	OK	OK	104.0	102.0	102.0	1.0	102.0	2.0	109.0
Molybdenum	ICP/MS	02/25/2013									0.0			
Selenium	ICP/MS	02/25/2013	0.0000	1.0000	OK	OK	OK	104.0	104.0	101.0	3.0	98.0		125.0
Selenium	ICP/MS	02/25/2013									8.0			
Uranium	ICP/MS	02/25/2013	0.0000	1.0000	OK	OK	OK	108.0	125.0	118.0	1.0	106.0	2.0	100.0
Uranium	ICP/MS	02/25/2013									1.0			

SAMPLE MANAGEMENT SYSTEM

Wet Chemistry Data Validation Worksheet

RIN: 13025100 **Lab Code:** PAR **Date Due:** 03/20/2013

Matrix: Water **Site Code:** GJO01 **Date Completed:** 03/04/2013

Analyte	Date Analyzed	CALIBRATION				Method Blank	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R^2	CCV	CCB						
SULFATE	02/22/2013	0.000	1.0000	OK	OK	OK	103.00	107.0	106.0	0	

Sampling Quality Control Assessment

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

Sampling Protocol

All monitoring wells met the Category I low-flow sampling criteria. Sample results for these wells were qualified with an "F" flag in the database, indicating the wells were purged and sampled using the low-flow sampling method. Surface water locations were sampled using a peristaltic pump and tubing reel.

Equipment Blank

An equipment blank (field ID 2311) was collected after decontamination of the hose reel used to collect the surface water samples. Selenium and uranium were detected in this blank at concentrations below the PQL. The associated sample results for these analytes were greater than 10 times the blank concentration, not requiring qualification. 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 was collected from location 14-13NA (field duplicate ID 2310). The duplicate results met the criteria, demonstrating acceptable overall precision.

SAMPLE MANAGEMENT SYSTEM

Validation Report: Equipment/Trip Blanks

RIN: 13025100 **Lab Code:** PAR **Project:** Grand Junction Office(GJO) **Validation Date:** 03/15/2013

Blank Data

Blank Type	Lab Sample ID	Lab Method	Analyte Name	Result	Qualifier	MDL	Units
Equipment Blank	1302232-5	SW6020	Selenium	0.041	B	0.032	UG/L

Sample ID	Sample Ticket	Location	Result	Dilution Factor	Lab Qualifier	Validation Qualifier
1302232-10	LDU 007	Lower Gunnison	5.6	5		
1302232-11	LDU 006	North Pond	4.7	5		
1302232-12	LDU 004	South Pond	0.47	1		
1302232-13	LDU 003	Upper Gunnison	5.7	5		
1302232-14	LDU 005	Upper Mid Gunnison	6.1	5		
1302232-15	LDU 008	Wetland Area	5	5		

Blank Data

Blank Type	Lab Sample ID	Lab Method	Analyte Name	Result	Qualifier	MDL	Units
Equipment Blank	1302232-5	SW6020	Uranium	0.015		0.0029	UG/L

Sample ID	Sample Ticket	Location	Result	Dilution Factor	Lab Qualifier	Validation Qualifier
1302232-10	LDU 007	Lower Gunnison	8.2	5		
1302232-11	LDU 006	North Pond	150	5		
1302232-12	LDU 004	South Pond	310	5		
1302232-13	LDU 003	Upper Gunnison	8.3	5		
1302232-14	LDU 005	Upper Mid Gunnison	8	5		
1302232-15	LDU 008	Wetland Area	5700	100		

SAMPLE MANAGEMENT SYSTEM

Validation Report: Field Duplicates

RIN: 13025100 **Lab Code:** PAR **Project:** Grand Junction Office(GJO) **Validation Date:** 03/15/2013

Duplicate: 2310 **Sample:** 14-13NA

Analyte	Sample Result	Sample Flag	Sample Error	Sample Dilution	Duplicate Result	Duplicate Flag	Duplicate Error	Duplicate Dilution	RPD	RER	Units
Manganese	3800			1	3700			1	2.67		UG/L
Molybdenum	100			10	100			10	0		UG/L
Selenium	0.27			1	0.35			1	NA		UG/L
SULFATE	1500			20	1500			20	0		MG/L
Uranium	270			10	270			10	0		UG/L

Certification

All laboratory analytical quality control criteria were met except as qualified in this report. The data qualifiers listed on the 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: Stephen Donivan 4-10-2013
Stephen Donivan

Data Validation Lead: Stephen Donivan 4-10-2013
Stephen Donivan

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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 environmental database. The application compares the new data set (in standard environmental database units) 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.

The molybdenum and uranium results for the Wetland Area sample were identified as potential outliers. There were no errors apparent in the analysis of this sample. The sample was analyzed twice for molybdenum and uranium at different dilution factors with comparable results between the analyses. The data for this sampling event are acceptable as qualified.

Data Validation Outliers Report - No Field Parameters
Comparison: All historical Data Beginning 01/01/2003
Laboratory: ALS Laboratory Group
RIN: 13025100
Report Date: 03/21/2013

					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	
GJO01	10-19N	N001	02/06/2013	Sulfate	2000		F	4100		F	2380		F	11	0	No
GJO01	10-19N	N001	02/06/2013	Uranium	0.13		F	0.35		F	0.15		F	11	0	No
GJO01	11-1S	N001	02/14/2013	Molybdenum	0.012		F	0.027		JF	0.014		F	10	0	No
GJO01	14-13NA	N001	02/06/2013	Uranium	0.27		F	0.48		F	0.31		F	10	0	No
GJO01	14-13NA	N002	02/06/2013	Uranium	0.27		F	0.48		F	0.31		F	10	0	No
GJO01	6-2N	N001	02/07/2013	Uranium	0.061		F	0.262		F	0.068		F	10	0	No
GJO01	8-4S	N001	02/06/2013	Manganese	1.6		F	1.5		F	0.0098		F	14	0	No
GJO01	GJ01-01	N001	02/06/2013	Manganese	0.6		F	0.548		F	0.31		F	12	0	No
GJO01	GJ01-01	N001	02/06/2013	Uranium	0.3		F	0.453		F	0.31		F	12	0	No
GJO01	GJ84-04	N001	02/06/2013	Molybdenum	0.06		F	0.104		F	0.068		F	10	0	No
GJO01	Wetland Area	0001	02/14/2013	Molybdenum	1.3			0.7		J	0.0038			10	0	Yes
GJO01	Wetland Area	0001	02/14/2013	Uranium	5.7			2.9			0.38			10	0	Yes

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 GJO01, Grand Junction Site
REPORT DATE: 03/21/2013
Location: 10-19N WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	02/06/2013	N001	-	0.58		F	#	0.00011	
Molybdenum	mg/L	02/06/2013	N001	-	0.024		F	#	0.00016	
Oxidation Reduction Potential	mV	02/06/2013	N001	-	77.7		F	#		
pH	s.u.	02/06/2013	N001	-	7.1		F	#		
Selenium	mg/L	02/06/2013	N001	-	0.0051		F	#	0.00016	
Specific Conductance	umhos /cm	02/06/2013	N001	-	3955		F	#		
Sulfate	mg/L	02/06/2013	N001	-	2000		F	#	25	
Temperature	C	02/06/2013	N001	-	12.13		F	#		
Turbidity	NTU	02/06/2013	N001	-	1.15		F	#		
Uranium	mg/L	02/06/2013	N001	-	0.13		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE GJO01, Grand Junction Site
REPORT DATE: 03/21/2013
Location: 11-1S WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	02/14/2013	N001	-	0.91		F	#	0.00011	
Molybdenum	mg/L	02/14/2013	N001	-	0.012		F	#	0.00016	
Oxidation Reduction Potential	mV	02/14/2013	N001	-	26		F	#		
pH	s.u.	02/14/2013	N001	-	7.42		F	#		
Selenium	mg/L	02/14/2013	N001	-	0.00095		F	#	0.000032	
Specific Conductance	umhos /cm	02/14/2013	N001	-	955		F	#		
Sulfate	mg/L	02/14/2013	N001	-	360		F	#	2.5	
Temperature	C	02/14/2013	N001	-	13.64		F	#		
Turbidity	NTU	02/14/2013	N001	-	4.53		F	#		
Uranium	mg/L	02/14/2013	N001	-	0.052		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE GJO01, Grand Junction Site
REPORT DATE: 03/21/2013
Location: 14-13NA WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	02/06/2013	N001	-	3.8		F	#	0.00011	
Manganese	mg/L	02/06/2013	N002	-	3.7		F	#	0.00011	
Molybdenum	mg/L	02/06/2013	N001	-	0.1		F	#	0.00032	
Molybdenum	mg/L	02/06/2013	N002	-	0.1		F	#	0.00032	
Oxidation Reduction Potential	mV	02/06/2013	N001	-	37.4		F	#		
pH	s.u.	02/06/2013	N001	-	7.07		F	#		
Selenium	mg/L	02/06/2013	N001	-	0.00027		F	#	0.000032	
Selenium	mg/L	02/06/2013	N002	-	0.00035		F	#	0.000032	
Specific Conductance	umhos /cm	02/06/2013	N001	-	2966		F	#		
Sulfate	mg/L	02/06/2013	N001	-	1500		F	#	10	
Sulfate	mg/L	02/06/2013	N002	-	1500		F	#	10	
Temperature	C	02/06/2013	N001	-	13.54		F	#		
Turbidity	NTU	02/06/2013	N001	-	6.14		F	#		
Uranium	mg/L	02/06/2013	N001	-	0.27		F	#	0.000029	
Uranium	mg/L	02/06/2013	N002	-	0.27		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GJO01, Grand Junction Site
REPORT DATE: 03/21/2013
Location: 6-2N WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	02/07/2013	N001	-	0.78		F	#	0.00011	
Molybdenum	mg/L	02/07/2013	N001	-	0.026		F	#	0.00032	
Oxidation Reduction Potential	mV	02/07/2013	N001	-	160.4		F	#		
pH	s.u.	02/07/2013	N001	-	7.53		F	#		
Selenium	mg/L	02/07/2013	N001	-	0.029		F	#	0.00032	
Specific Conductance	umhos /cm	02/07/2013	N001	-	2326		F	#		
Sulfate	mg/L	02/07/2013	N001	-	1000		F	#	10	
Temperature	C	02/07/2013	N001	-	17.84		F	#		
Turbidity	NTU	02/07/2013	N001	-	1.91		F	#		
Uranium	mg/L	02/07/2013	N001	-	0.061		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GJO01, Grand Junction Site
REPORT DATE: 03/21/2013
Location: 8-4S WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	02/06/2013	N001	-	1.6		F	#	0.00011	
Molybdenum	mg/L	02/06/2013	N001	-	0.14		F	#	0.00032	
Oxidation Reduction Potential	mV	02/06/2013	N001	-	116.6		F	#		
pH	s.u.	02/06/2013	N001	-	7.26		F	#		
Selenium	mg/L	02/06/2013	N001	-	0.017		F	#	0.00032	
Specific Conductance	umhos /cm	02/06/2013	N001	-	1744		F	#		
Sulfate	mg/L	02/06/2013	N001	-	700		F	#	5	
Temperature	C	02/06/2013	N001	-	13.72		F	#		
Turbidity	NTU	02/06/2013	N001	-	2.53		F	#		
Uranium	mg/L	02/06/2013	N001	-	0.49		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GJO01, Grand Junction Site
REPORT DATE: 03/21/2013
Location: GJ01-01 WELL South of Building 20

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	02/06/2013	N001	15.5 - 25.5	0.6		F	#	0.00011	
Molybdenum	mg/L	02/06/2013	N001	15.5 - 25.5	0.09		F	#	0.00032	
Oxidation Reduction Potential	mV	02/06/2013	N001	15.5 - 25.5	115.5		F	#		
pH	s.u.	02/06/2013	N001	15.5 - 25.5	7.19		F	#		
Selenium	mg/L	02/06/2013	N001	15.5 - 25.5	0.032		F	#	0.00032	
Specific Conductance	umhos /cm	02/06/2013	N001	15.5 - 25.5	1563		F	#		
Sulfate	mg/L	02/06/2013	N001	15.5 - 25.5	570		F	#	5	
Temperature	C	02/06/2013	N001	15.5 - 25.5	14.88		F	#		
Turbidity	NTU	02/06/2013	N001	15.5 - 25.5	5.55		F	#		
Uranium	mg/L	02/06/2013	N001	15.5 - 25.5	0.3		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GJO01, Grand Junction Site
REPORT DATE: 03/21/2013
Location: GJ84-04 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	02/06/2013	N001	-	3.5		F	#	0.00011	
Molybdenum	mg/L	02/06/2013	N001	-	0.06		F	#	0.00016	
Oxidation Reduction Potential	mV	02/06/2013	N001	-	19		F	#		
pH	s.u.	02/06/2013	N001	-	7.1		F	#		
Selenium	mg/L	02/06/2013	N001	-	0.00016		F	#	0.000032	
Specific Conductance	umhos /cm	02/06/2013	N001	-	2844		F	#		
Sulfate	mg/L	02/06/2013	N001	-	1400		F	#	10	
Temperature	C	02/06/2013	N001	-	12.69		F	#		
Turbidity	NTU	02/06/2013	N001	-	4.3		F	#		
Uranium	mg/L	02/06/2013	N001	-	0.24		F	#	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.

Surface Water Quality Data

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Surface Water Quality Data by Location (USEE102) FOR SITE GJO01, Grand Junction Site
REPORT DATE: 03/21/2013
Location: Lower Gunnison SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Molybdenum	mg/L	02/14/2013	0001	0.0026			#	0.00016	
Oxidation Reduction Potential	mV	02/14/2013	N001	206			#		
pH	s.u.	02/14/2013	N001	8.31			#		
Selenium	mg/L	02/14/2013	0001	0.0056			#	0.00016	
Specific Conductance	umhos/cm	02/14/2013	N001	993			#		
Sulfate	mg/L	02/14/2013	0001	400			#	2.5	
Temperature	C	02/14/2013	N001	0.64			#		
Turbidity	NTU	02/14/2013	N001	44.3			#		
Uranium	mg/L	02/14/2013	0001	0.0082			#	0.000015	

Surface Water Quality Data by Location (USEE102) FOR SITE GJO01, Grand Junction Site
REPORT DATE: 03/21/2013
Location: North Pond SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Molybdenum	mg/L	02/14/2013	N001	0.0073			#	0.00016	
Oxidation Reduction Potential	mV	02/14/2013	N001	217			#		
pH	s.u.	02/14/2013	N001	7.92			#		
Selenium	mg/L	02/14/2013	N001	0.0047			#	0.00016	
Specific Conductance	umhos/cm	02/14/2013	N001	1960			#		
Sulfate	mg/L	02/14/2013	N001	950			#	10	
Temperature	C	02/14/2013	N001	8.95			#		
Turbidity	NTU	02/14/2013	N001	5.98			#		
Uranium	mg/L	02/14/2013	N001	0.15			#	0.000015	

Surface Water Quality Data by Location (USEE102) FOR SITE GJO01, Grand Junction Site
REPORT DATE: 03/21/2013
Location: South Pond SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Molybdenum	mg/L	02/14/2013	N001	0.058			#	0.00016	
Oxidation Reduction Potential	mV	02/14/2013	N001	105.9			#		
pH	s.u.	02/14/2013	N001	7.94			#		
Selenium	mg/L	02/14/2013	N001	0.00047			#	0.000032	
Specific Conductance	umhos/cm	02/14/2013	N001	2238			#		
Sulfate	mg/L	02/14/2013	N001	1200			#	10	
Temperature	C	02/14/2013	N001	6.11			#		
Turbidity	NTU	02/14/2013	N001	8.03			#		
Uranium	mg/L	02/14/2013	N001	0.31			#	0.000015	

Surface Water Quality Data by Location (USEE102) FOR SITE GJO01, Grand Junction Site
REPORT DATE: 03/21/2013
Location: Upper Gunnison SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Molybdenum	mg/L	02/14/2013	0001	0.0029			#	0.00016	
Oxidation Reduction Potential	mV	02/14/2013	N001	198			#		
pH	s.u.	02/14/2013	N001	8.3			#		
Selenium	mg/L	02/14/2013	0001	0.0057			#	0.00016	
Specific Conductance	umhos/cm	02/14/2013	N001	999			#		
Sulfate	mg/L	02/14/2013	0001	400			#	2.5	
Temperature	C	02/14/2013	N001	0.51			#		
Turbidity	NTU	02/14/2013	N001	26.5			#		
Uranium	mg/L	02/14/2013	0001	0.0083			#	0.000015	

Surface Water Quality Data by Location (USEE102) FOR SITE GJO01, Grand Junction Site
REPORT DATE: 03/21/2013
Location: Upper Mid Gunnison SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Molybdenum	mg/L	02/14/2013	0001	0.0026			#	0.00016	
Oxidation Reduction Potential	mV	02/14/2013	N001	198.9			#		
pH	s.u.	02/14/2013	N001	8.28			#		
Selenium	mg/L	02/14/2013	0001	0.0061			#	0.00016	
Specific Conductance	umhos/cm	02/14/2013	N001	989			#		
Sulfate	mg/L	02/14/2013	0001	400			#	2.5	
Temperature	C	02/14/2013	N001	21.97			#		
Turbidity	NTU	02/14/2013	N001	34.7			#		
Uranium	mg/L	02/14/2013	0001	0.008			#	0.000015	

Surface Water Quality Data by Location (USEE102) FOR SITE GJO01, Grand Junction Site

REPORT DATE: 03/21/2013

Location: Wetland Area SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Molybdenum	mg/L	02/14/2013	0001	1.3			#	0.00016	
Oxidation Reduction Potential	mV	02/14/2013	N001	239			#		
pH	s.u.	02/14/2013	N001	9.03			#		
Selenium	mg/L	02/14/2013	0001	0.005			#	0.00016	
Specific Conductance	umhos/cm	02/14/2013	N001	16303			#		
Sulfate	mg/L	02/14/2013	0001	10000			#	100	
Temperature	C	02/14/2013	N001	10.32			#		
Turbidity	NTU	02/14/2013	N001	42.8			#		
Uranium	mg/L	02/14/2013	0001	5.7			#	0.00029	

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.

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Equipment Blank Data

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BLANKS REPORT

LAB: PARAGON/ALS LABORATORY GROUP (Fort Collins, CO)
RIN: 13025100
Report Date: 03/21/2013

Parameter	Site Code	Location ID	Sample Date	Sample ID	Units	Result	Qualifiers Lab	Qualifiers Data	Detection Limit	Uncertainty	Sample Type
Manganese	GJO01	0999	02/14/2013	N001	mg/L	0.00011	U		0.00011		E
Molybdenum	GJO01	0999	02/14/2013	N001	mg/L	0.000032	U		0.000032		E
Selenium	GJO01	0999	02/14/2013	N001	mg/L	0.000041	B		0.000032		E
Sulfate	GJO01	0999	02/14/2013	N001	mg/L	0.5	U		0.5		E
Uranium	GJO01	0999	02/14/2013	N001	mg/L	0.000015			0.0000029		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 GJO01, Grand Junction Site
REPORT DATE: 03/21/2013

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
10-19N	O	4566.62	02/06/2013	10:50:54	13.15	4553.47	
11-1S	O	4572.83	02/14/2013	14:30:20	16.18	4556.65	
14-13NA	O	4560.58	02/06/2013	11:40:15	6.06	4554.52	
6-2N	O	4569.89	02/07/2013	09:30:24	14.15	4555.74	
8-4S	O	4568.59	02/06/2013	14:20:30	11.55	4557.04	
GJ01-01		4571.37	02/06/2013	14:40:56	15.4	4555.97	
GJ84-04	D	4563.24	02/06/2013	11:15:38	9.26	4553.98	

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 B Below top of pump

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Time-Concentration Graphs
Groundwater Locations

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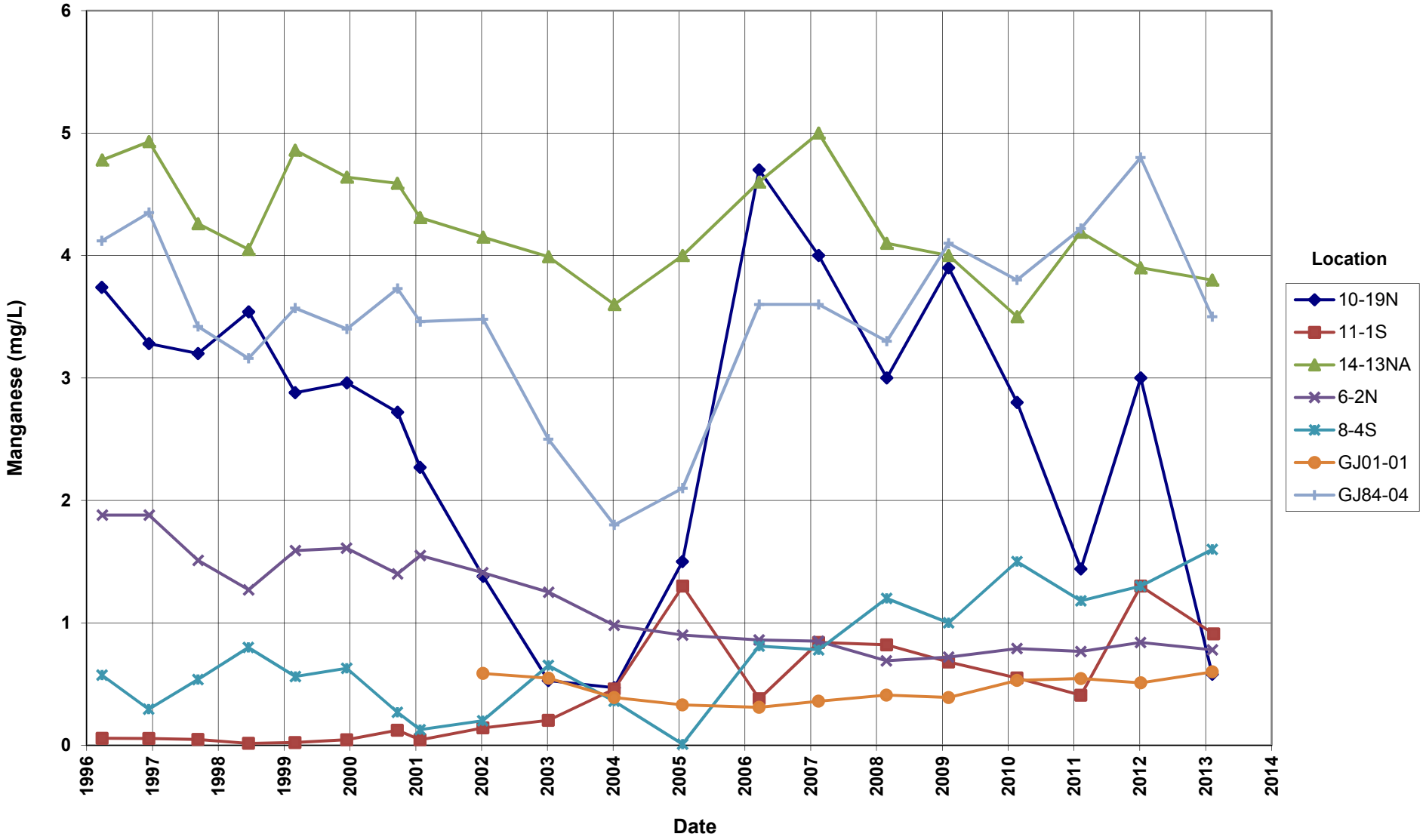
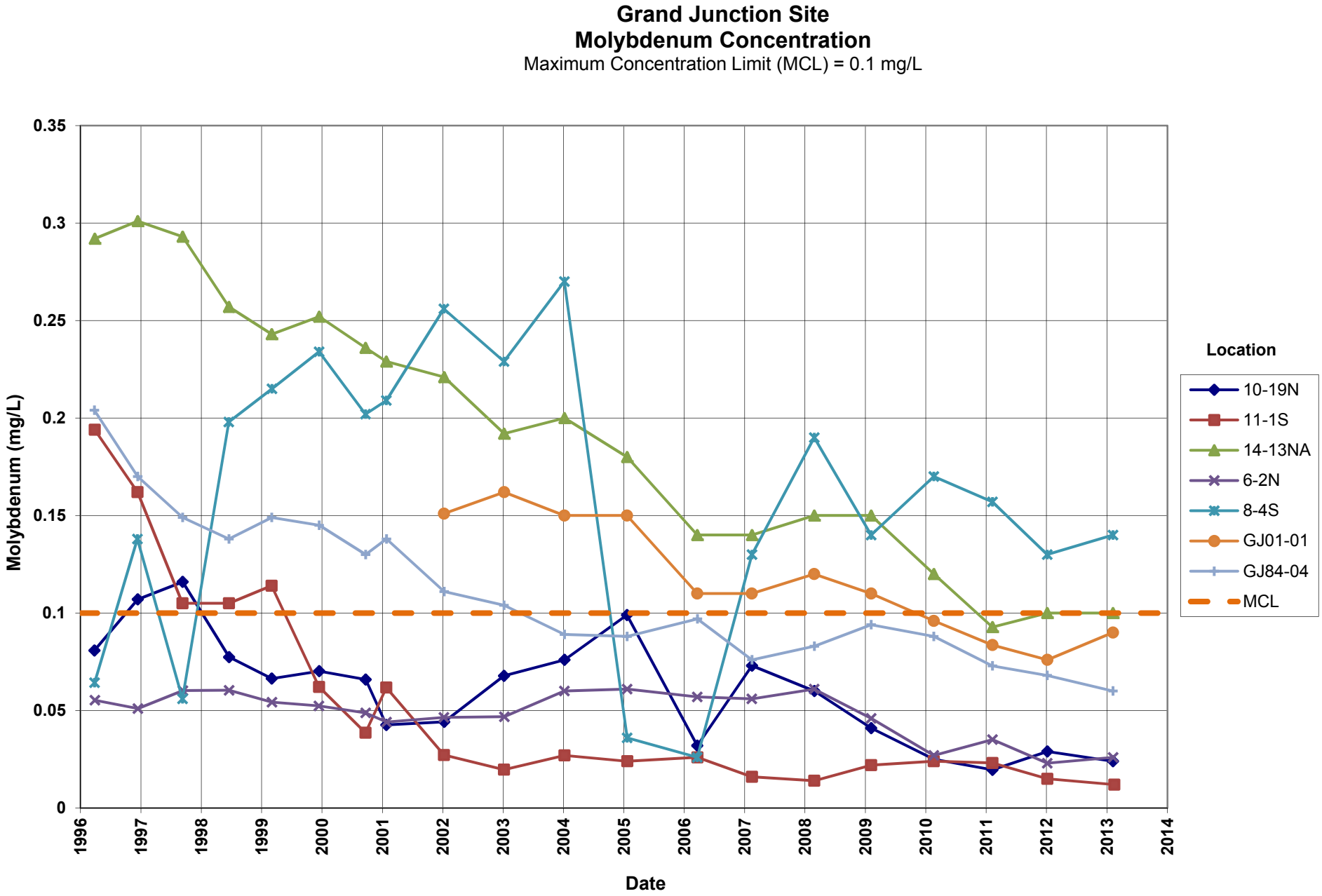
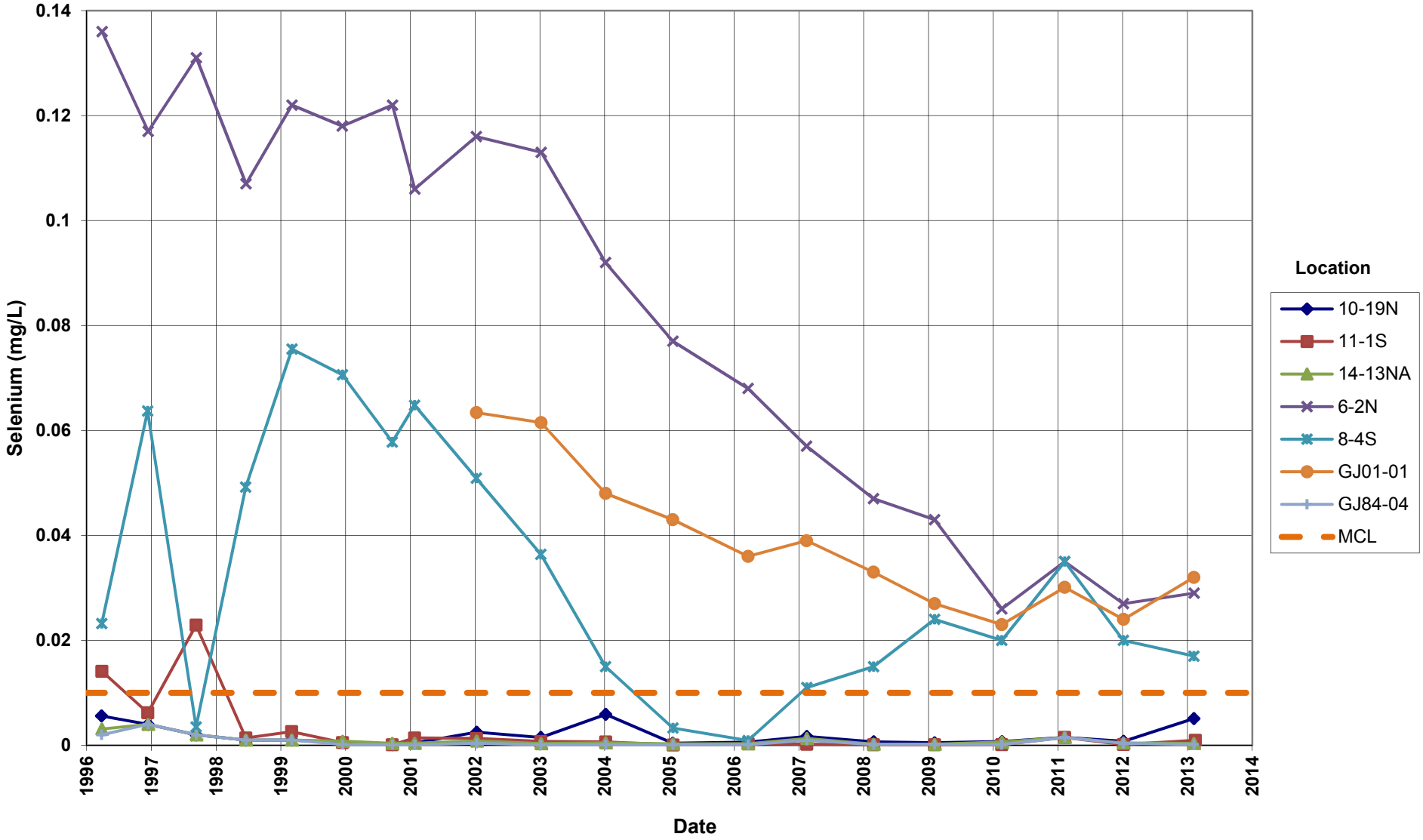
Grand Junction Site
Manganese Concentration




Grand Junction Site
Molybdenum Concentration
Maximum Concentration Limit (MCL) = 0.1 mg/L
Molybdenum (mg/L)
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Date
Location
10-19N
11-1S
14-13NA
6-2N
8-4S
GJ01-01
GJ84-04
MCL

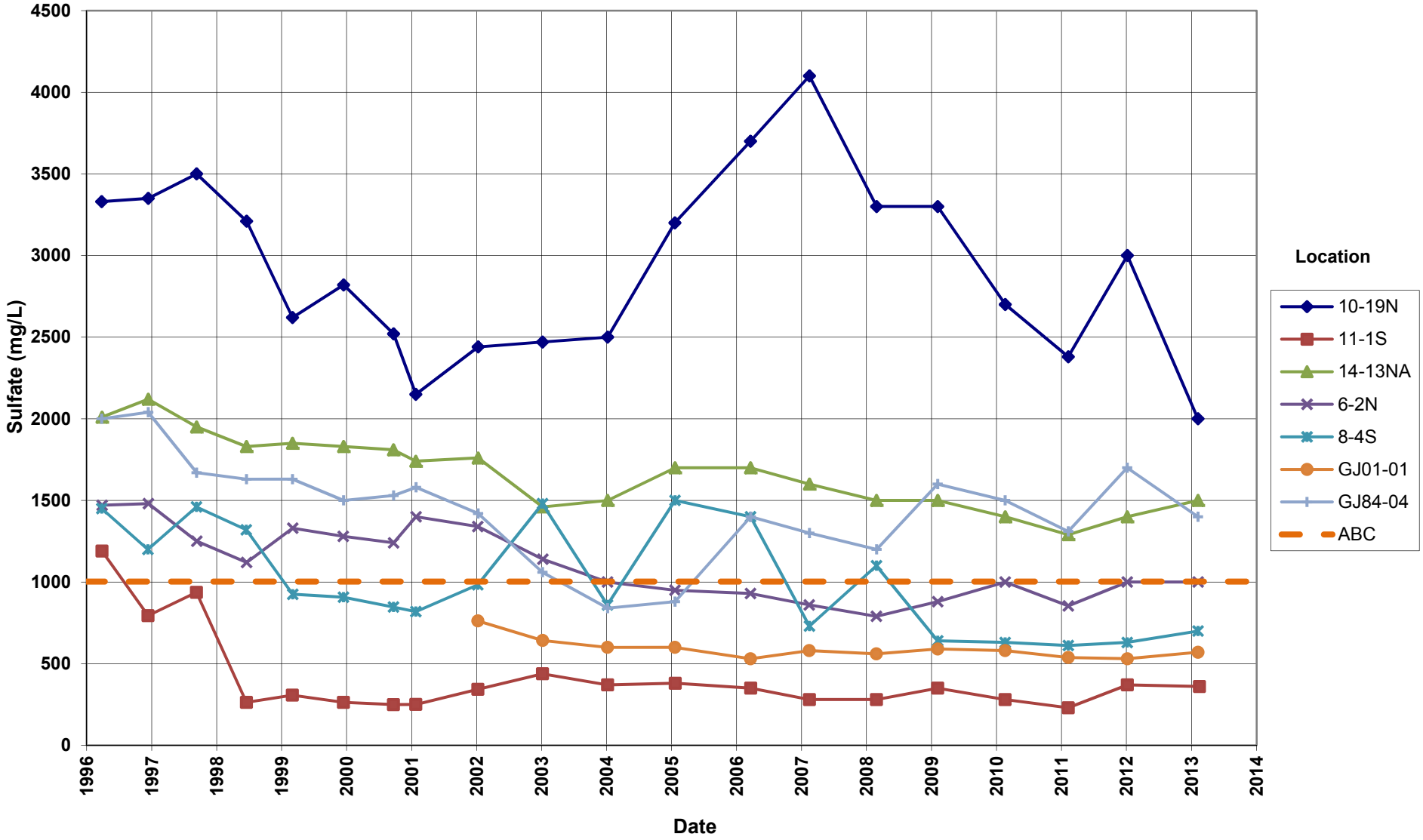
Grand Junction Site
Selenium Concentration
Maximum Concentration Limit (MCL) = 0.01 mg/L

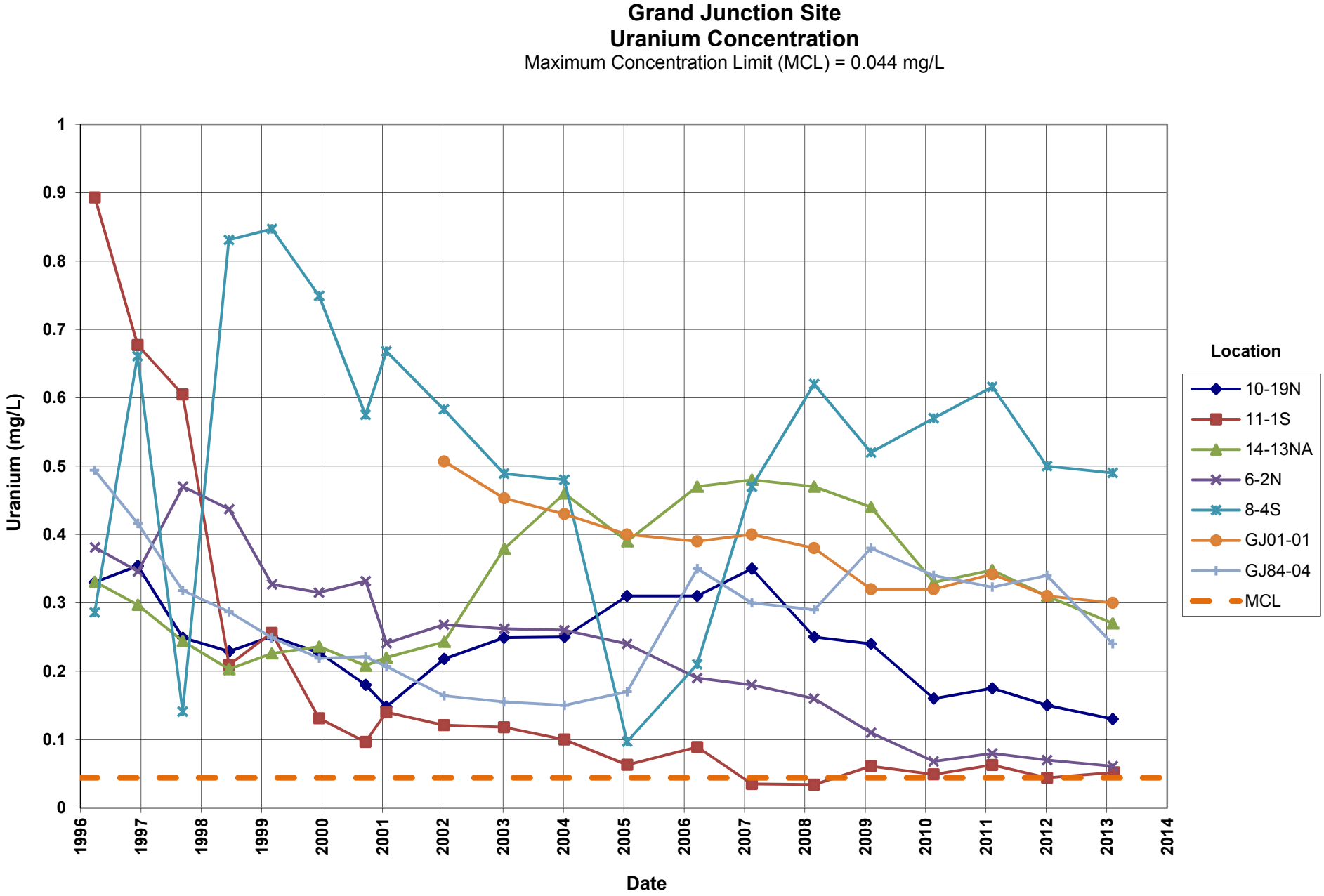


Grand Junction Site
Sulfate Concentration

Average Background Concentration (ABC) in Background Wells = 1003 mg/L

(The ABC is the average sulfate result from background wells GJ84-09 and GJ84-10 from 1990 through 1995)




Grand Junction Site
Uranium Concentration
Maximum Concentration Limit (MCL) = 0.044 mg/L
Uranium (mg/L)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Date
Location
10-19N
11-1S
14-13NA
6-2N
8-4S
GJ01-01
GJ84-04
MCL

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Time-Concentration Graphs
Surface Water Locations

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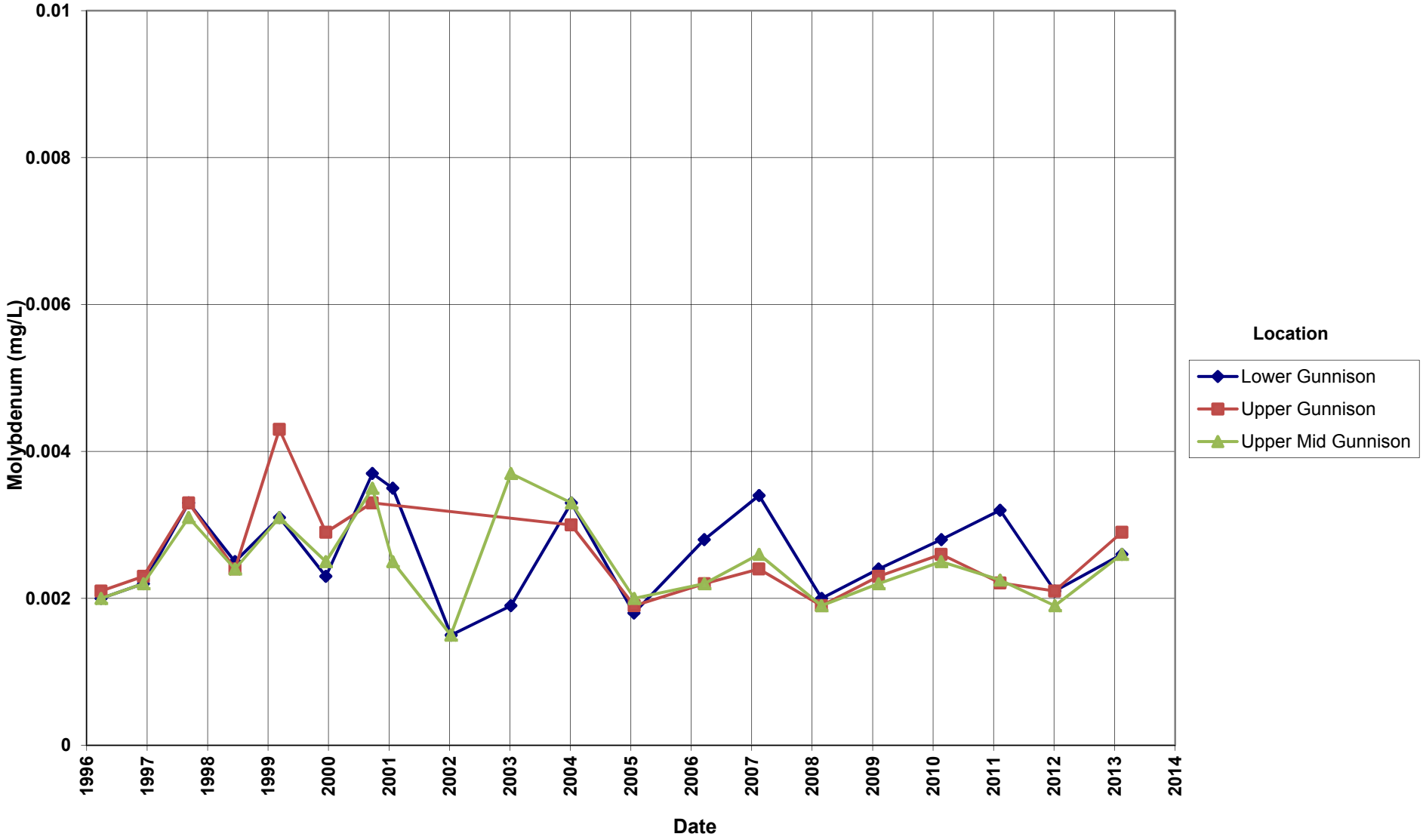
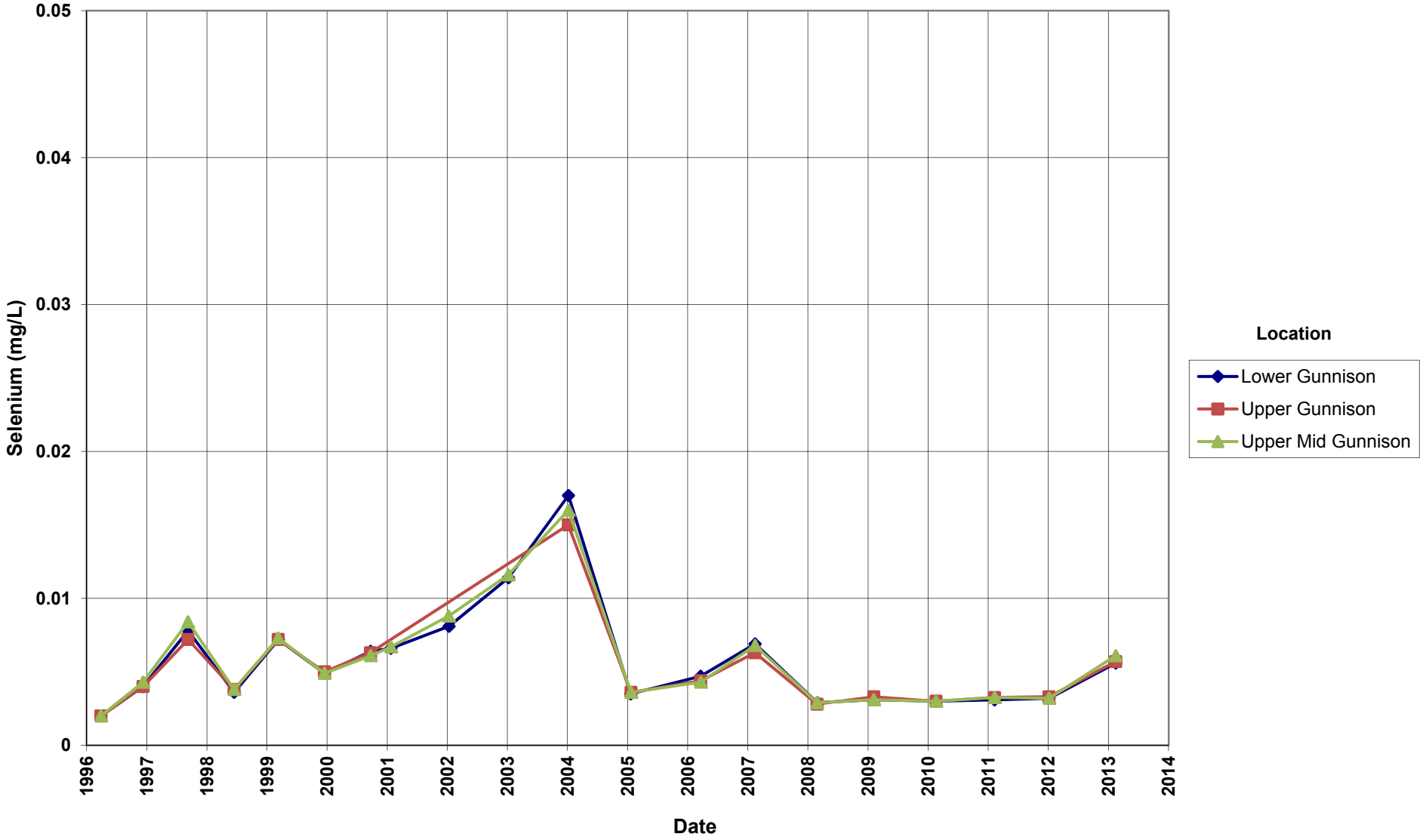
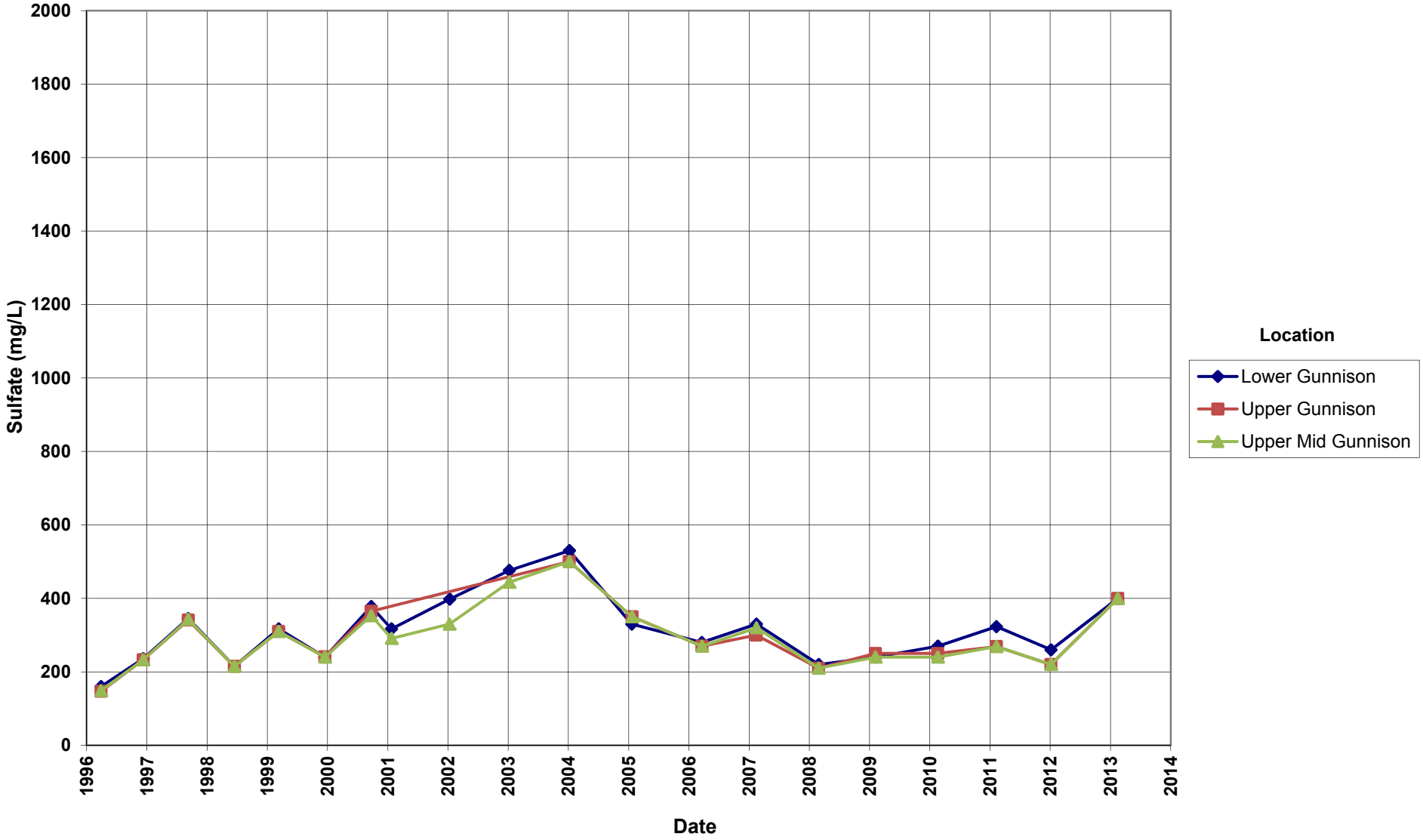
Grand Junction Site
Molybdenum Concentration
River Locations



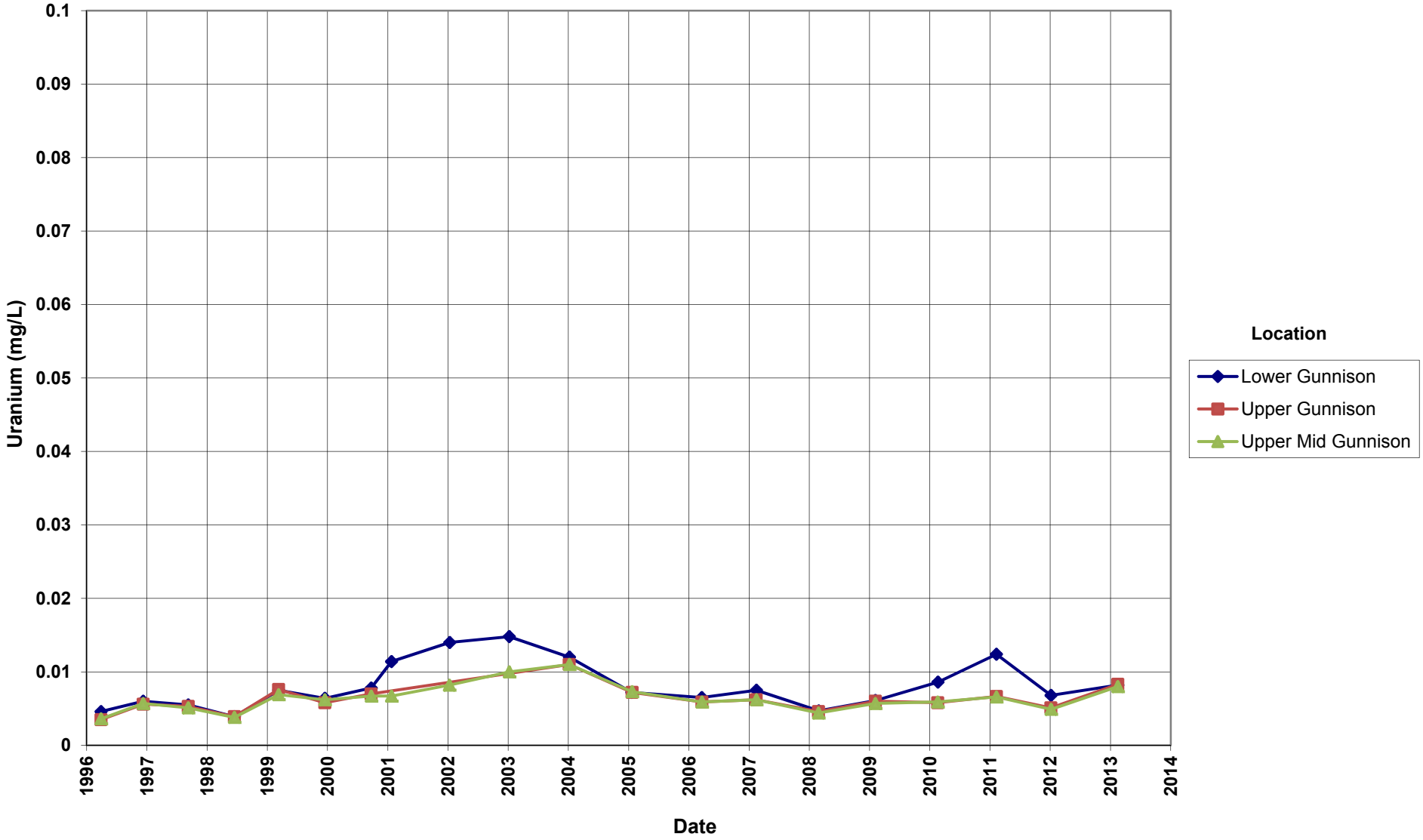
Grand Junction Site
Selenium Concentration
River Locations

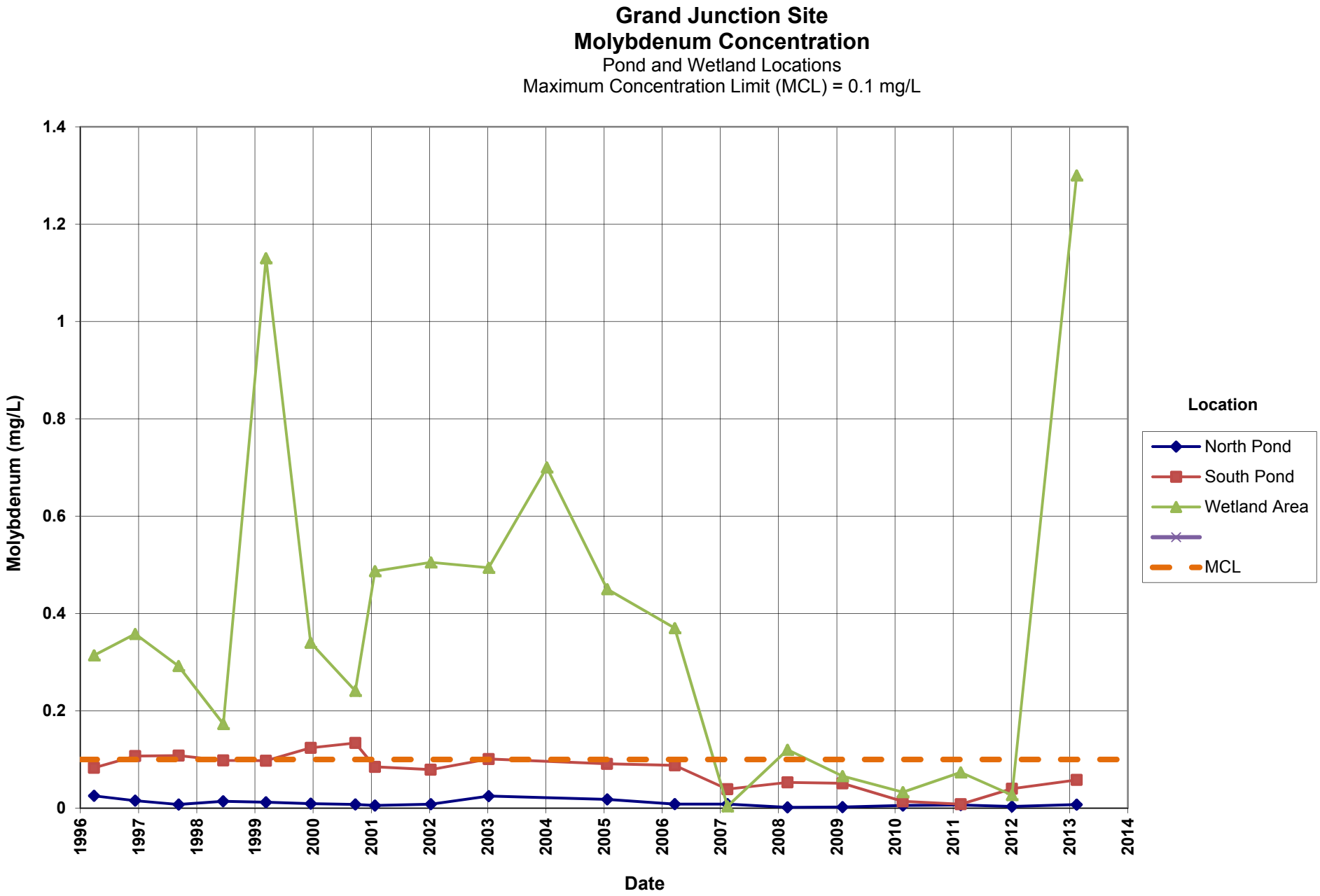


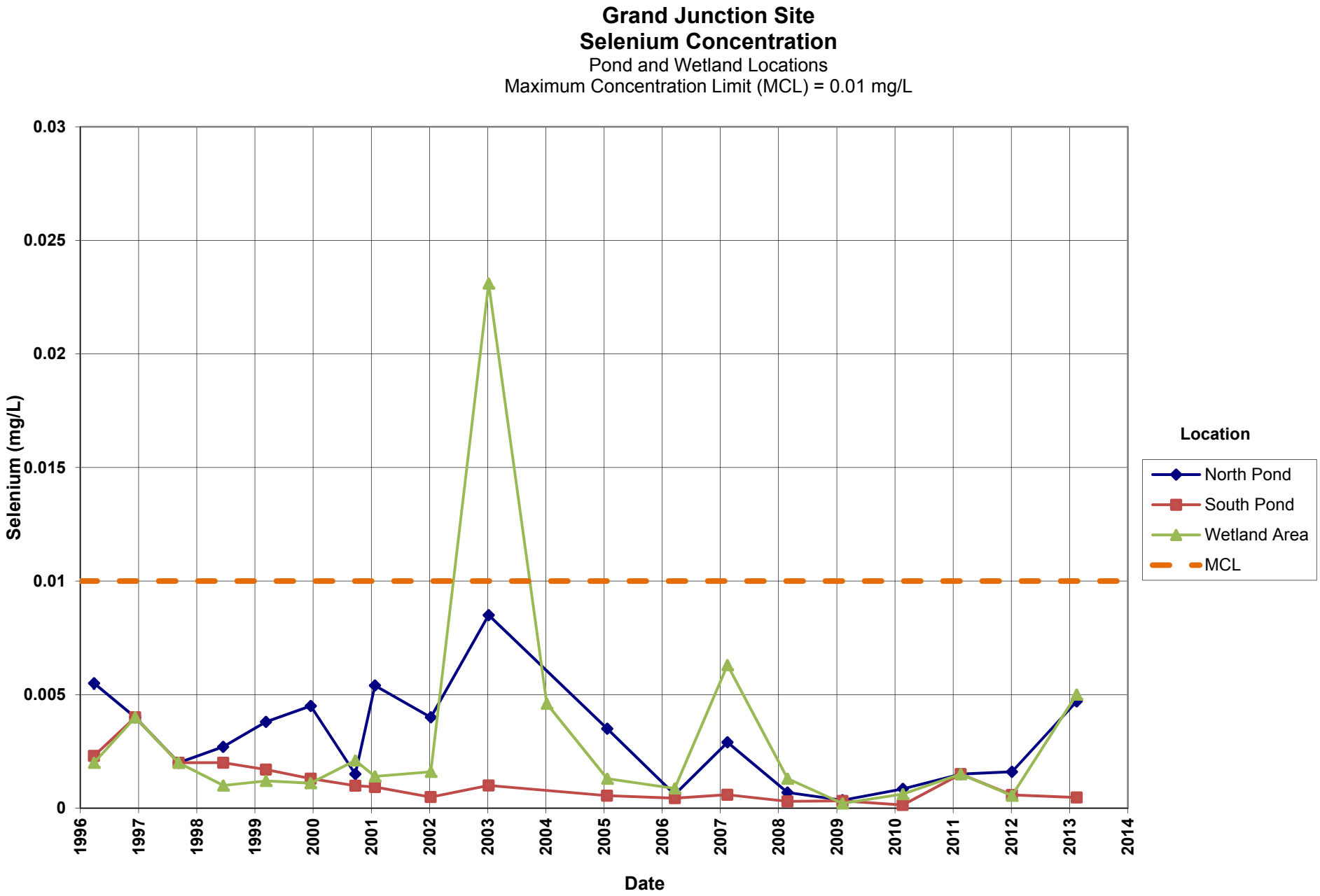
Grand Junction Site
Sulfate Concentration
River Locations



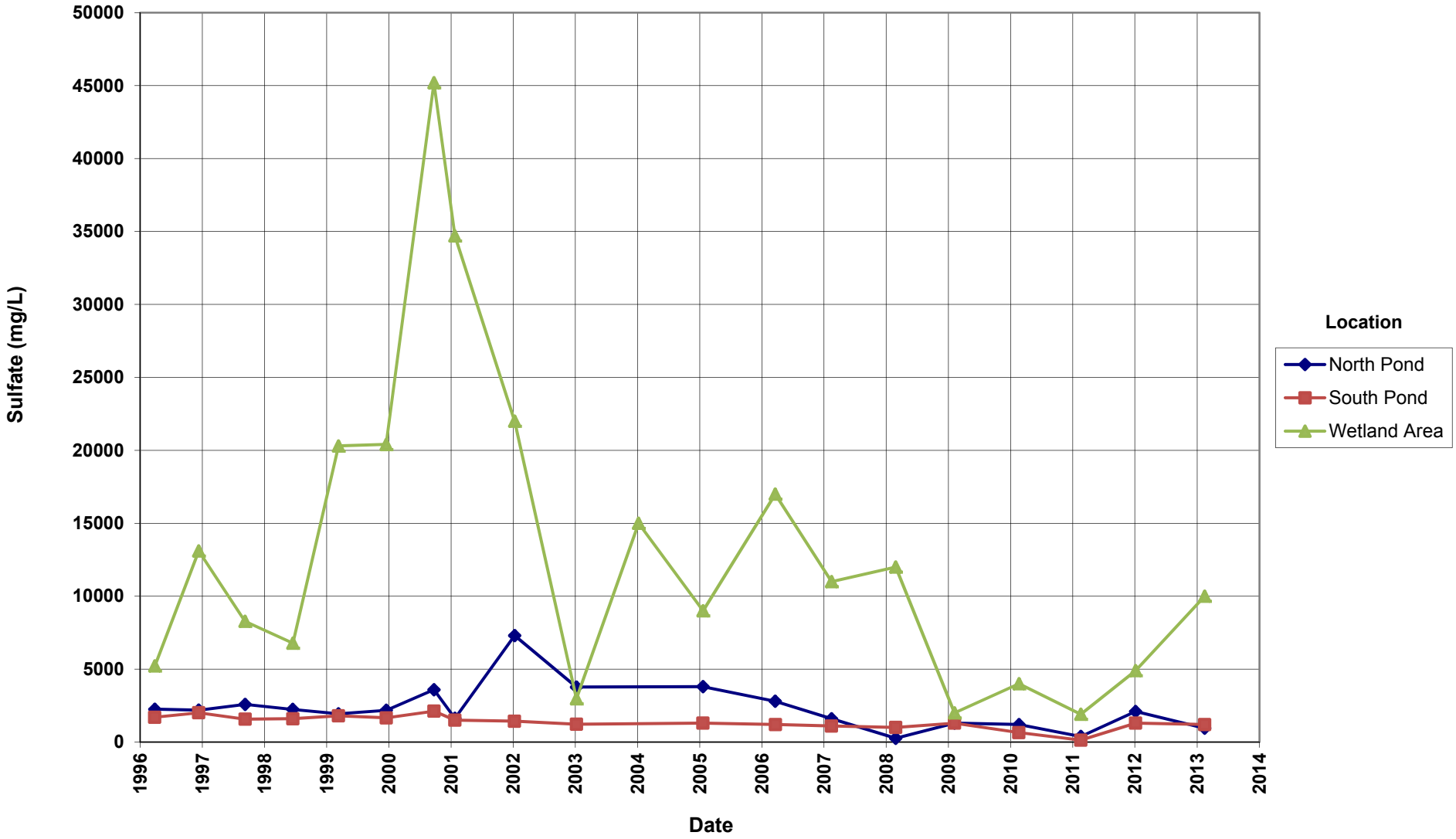
Grand Junction Site
Uranium Concentration
River Locations

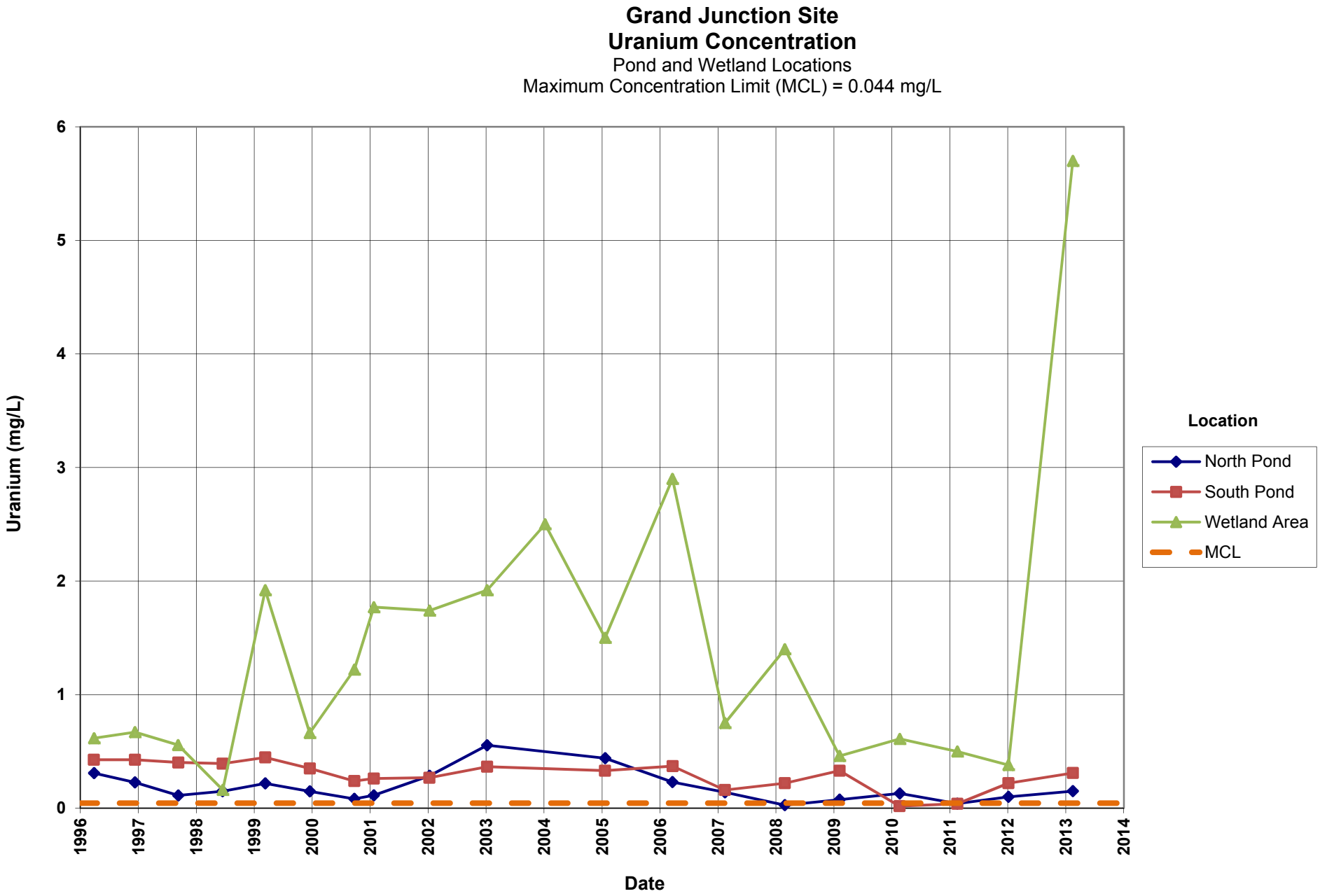



Grand Junction Site
Molybdenum Concentration
Pond and Wetland Locations
Maximum Concentration Limit (MCL) = 0.1 mg/L
Molybdenum (mg/L)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Date
Location
North Pond
South Pond
Wetland Area
MCL


Grand Junction Site
Selenium Concentration
Pond and Wetland Locations
Maximum Concentration Limit (MCL) = 0.01 mg/L
Selenium (mg/L)
0.03
0.025
0.02
0.015
0.01
0.005
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Date
Location
North Pond
South Pond
Wetland Area
MCL

Grand Junction Site
Sulfate Concentration
Pond and Wetland Locations




Grand Junction Site
Uranium Concentration
Pond and Wetland Locations
Maximum Concentration Limit (MCL) = 0.044 mg/L
Uranium (mg/L)
0
1
2
3
4
5
6
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Date
Location
North Pond
South Pond
Wetland Area
MCL

Attachment 3
Sampling and Analysis Work Order

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Task Order LM00-501
Control Number 13-0319

February 5, 2013

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

SUBJECT: Contract No. DE–AM01–07LM00060, S.M. Stoller Corporation (Stoller)
February 2013 Environmental Sampling at the Grand Junction, Colorado, Site

REFERENCE: Task Order LM00-501-04-302-402, Grand Junction, Colorado, Site

Dear Mr. Bush:

The purpose of this letter is to inform you of the upcoming sampling event at the Grand Junction, Colorado, site. Enclosed are the map and tables specifying sample locations and analytes for routine monitoring. Water quality data will be collected from this site as part of the environmental sampling currently scheduled to begin the week of February 4, 2013.

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

Monitoring Wells*

8-4S Nr	11-1S Nr	6-2N Nr	14-13NA Nr	GJ84-04 Nr	GJ01-01 Al	10-19N Nr

*NOTE: Al = Alluvium; Nr = No recovery of data for classifying

Surface locations

Upper Gunnison	Upper Middle Gunnison	Lower Gunnison	Wetland Area
South Pond	North Pond		

All samples will be collected as directed in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites*. The Access Agreement for the site is in place, which will allow access to all monitoring locations.

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

Please call me at (970) 248-6654 if you have any questions.

Sincerely,

Sam Campbell
Site Lead

SC/lcg/lb

Enclosures (3)

cc: (electronic)
Karl Stoeckle, DOE
Sam Campbell, Stoller
Steve Donivan, Stoller
Bev Gallagher, Stoller
Lauren Goodknight, Stoller
EDD Delivery
rc-grand.junction
File: GJO 410.02(A)

Sampling Frequencies for Locations at Grand Junction Office Site, Colorado

Location ID	Quarterly	Semiannually	Annually	Biennially	Not Sampled	Notes
Monitoring Wells						
8-4S			X			
11-1S			X			
6-2N			X			
14-13NA			X			
GJ84-04			X			
GJ01-01			X			
10-19N			X			
Surface Locations						
Upper Gunnison			X			
Upper Middle Gunnison			X			
Lower Gunnison			X			
South Pond			X			
North Pond			X			
Wetland Area			X			

Sampling conducted in February

Constituent Sampling Breakdown

Site	Grand Junction Office Facility				
Analyte	**Groundwater**	**Surface Water**	**Required Detection Limit (mg/L)**	**Analytical Method**	**Line Item Code**
Approx. No. Samples/yr	7	6			
Field Measurements					
Alkalinity					
Dissolved Oxygen					
Redox Potential	X	X			
pH	X	X			
Specific Conductance	X	X			
Turbidity	X	X			
Temperature	X	X			
Laboratory Measurements					
Aluminum					
Ammonia as N (NH3-N)					
Calcium					
Chloride					
Chromium					
Gross Alpha					
Gross Beta					
Iron					
Lead					
Magnesium					
Manganese	X		0.005	SW-846 6010	LMM-01
Molybdenum	X	X	0.003	SW-846 6020	LMM-02
Nickel					
Nickel-63					
Nitrate + Nitrite as N (NO_3+NO_2)-N					
Potassium					
Radium-226					
Radium-228					
Selenium	X	X	0.0001	SW-846 6020	LMM-02
Silica					
Sodium					
Strontium					
Sulfate	X	X	0.5	SW-846 9056	MIS-A-044
Sulfide					
Total Dissolved Solids					

Constituent Sampling Breakdown

Site	Grand Junction Office Facility				
Analyte	**Groundwater**	**Surface Water**	**Required Detection Limit (mg/L)**	**Analytical Method**	**Line Item Code**
Approx. No. Samples/yr	7	6			
Total Organic Carbon					
Uranium	X	X	0.0001	SW-846 6020	LMM-02
Vanadium					
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.

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Attachment 4
Trip Report

Stoller
Grand Junction Office
established 1959

Memorandum

DATE: February 20, 2013

TO: Sam Campbell

FROM: David Atkinson

SUBJECT: Sampling Trip Report

Site: Grand Junction Office

Dates of Sampling Event: 2/6/2013 through 2/14/2013

Team Members: David Atkinson, Sam Campbell, Kent Moe

Number of Locations Sampled: 7 well locations, 6 surface water locations, 1 field duplicate and 1 equipment blank.

Locations Not Sampled/Reason: None.

Location Specific Information: The outer casing of monitoring well location 11-1S was completely full of water and the inner metal casing, including inside the PVC well casing was encased in ice. There was no water tight cap on the well casing which allowed water to infiltrate from the outer casing and freeze inside the PVC casing. The ice had to be chipped out and removed before gaining access to the well. Approximately 2 casing volumes (5 gallons) were purged from the top of the water column prior to beginning sampling. All 3 Gunnison River locations (Upper, Upper Mid, and Lower) and the Wetlands Area location had to be filtered due to having turbidities higher than 10 NTUs. Due to ice on the surface water locations and monitoring well location 11-1S, sampling could not be completed during the week of February 6th. Sampling at these locations was postponed until February 14th, when enough ice had melted to allow access to the sample collection points.

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

False ID	True ID	QC Type
2310	14-13NA	Duplicate
2311	Upper Gunnison	Rinsate/Equipment Blank

RIN Number Assigned: All samples were assigned to RIN 13025100.

Sample Shipment: Samples were shipped overnight via FedEx to ALS Laboratory Group, Fort Collins CO, from Grand Junction CO, on Tuesday February 19, 2013.

Water Level Measurements: None

Well Inspection Summary: None

Field Variance: None.

Equipment: No issues identified.

Institutional Controls:

Fences, Gates, Locks: Appeared to be in working condition.
Trespassing/Site Disturbances: No issues identified.

Site Issues:

Disposal Cell/Drainage Structure Integrity: None
Vegetation/Noxious Weed Concerns: Extensive willow growth along the western edge of the south pond has made driving access to the sample point difficult.
Maintenance Requirements: None.
Access Issues: None.

Corrective Action Taken/To be Taken: A water tight expansion plug will be installed in well 11-1S.

cc: (electronic)
Rich Bush, DOE
Sam Campbell, Stoller
Steve Donivan, Stoller
EDD Delivery

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