LMS/GUP/S04641

Data Validation Package

May and June 2008 Groundwater and Surface Water Sampling at the Gunnison, Colorado, Processing, Site

August 2008

U.S. Department of Energy
Office of Legacy Management

Work Performed by the S.M. Stoller Corporation Under DOE Contract No. DE–AM01–07LM00060 for the U.S. Department of Energy Office of Legacy Management.

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Sampling Event Summary

Site: Gunnison, Colorado, Processing Site

Sampling Period: May 5-7, 2008 plus June 10, 2008

This event included annual sampling of wells and surface water locations at the Gunnison, Colorado, Processing Site. Sampling and analysis was conducted as specified in *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites*.

Samples were collected from 29 monitor wells, 8 domestic wells, and 5 surface locations at the processing site as specified in the *Ground Water Compliance Action Plan for the Gunnison, Colorado, Processing Site*. Duplicate samples were collected from locations 0102 and 0112; duplicate results met laboratory duplicate criteria demonstrating acceptable overall precision. An equipment blank was not collected during this sampling event. Water levels were measured at all monitor wells that were sampled.

Manganese and uranium were selected as the constituents of potential concern (COPC) at the Gunnison site because they exceeded a risk-based benchmark and a groundwater standard, respectively. A variety of tailings-related contaminants were monitored in the past, which were eliminated as COPCs because concentrations did not exceed groundwater standards and/or did not pose a significant risk to human health and the environment. Monitor wells with sample concentrations that exceeded the U.S. Environmental Protection Agency (EPA) maximum concentration limit (MCL) for uranium (40 CFR 192) or the EPA drinking water equivalent level (DWEL) for manganese are listed in Table 1.

Time versus concentration graphs for selected processing site monitor wells are included with the analytical data. Time versus concentration graphs for manganese indicate that concentrations of manganese in groundwater beneath and downgradient of the site are above the DWEL, but concentrations are generally decreasing with time. Time versus concentration graphs for uranium indicate that concentrations of uranium in groundwater beneath and downgradient of the site are above the MCL, with concentrations decreasing in some portions of the aquifer and remaining constant or increasing in others.

Uranium concentrations in the eight domestic wells sampled near the processing site were all below the EPA drinking water standard (0.030 milligrams per liter [mg/L]), and manganese concentrations in these wells were all below the DWEL.

Table 1. Gunnison Locations That Exceed the Uranium MCL and Manganese DWEL

Analyte	MCL[a]	DWEL [b]	Location	Concentration [c]
Uranium	0.044		0005	0.06
			0006	0.76
			0012R	0.37
			0113	0.096
			0183	0.064
Manganese		1.6	0105	3.5
			0106	6.5
			0112	5.5
			0135	3.5

[a]Uranium standard is listed in 40 CFR 192.02 Table 1 to Subpart A; units are in mg/L.
[b]DWEL from EPA 's *2004 Edition of the Drinking Water Standards and Health Advisories.*
[c]Units are in mg/L.

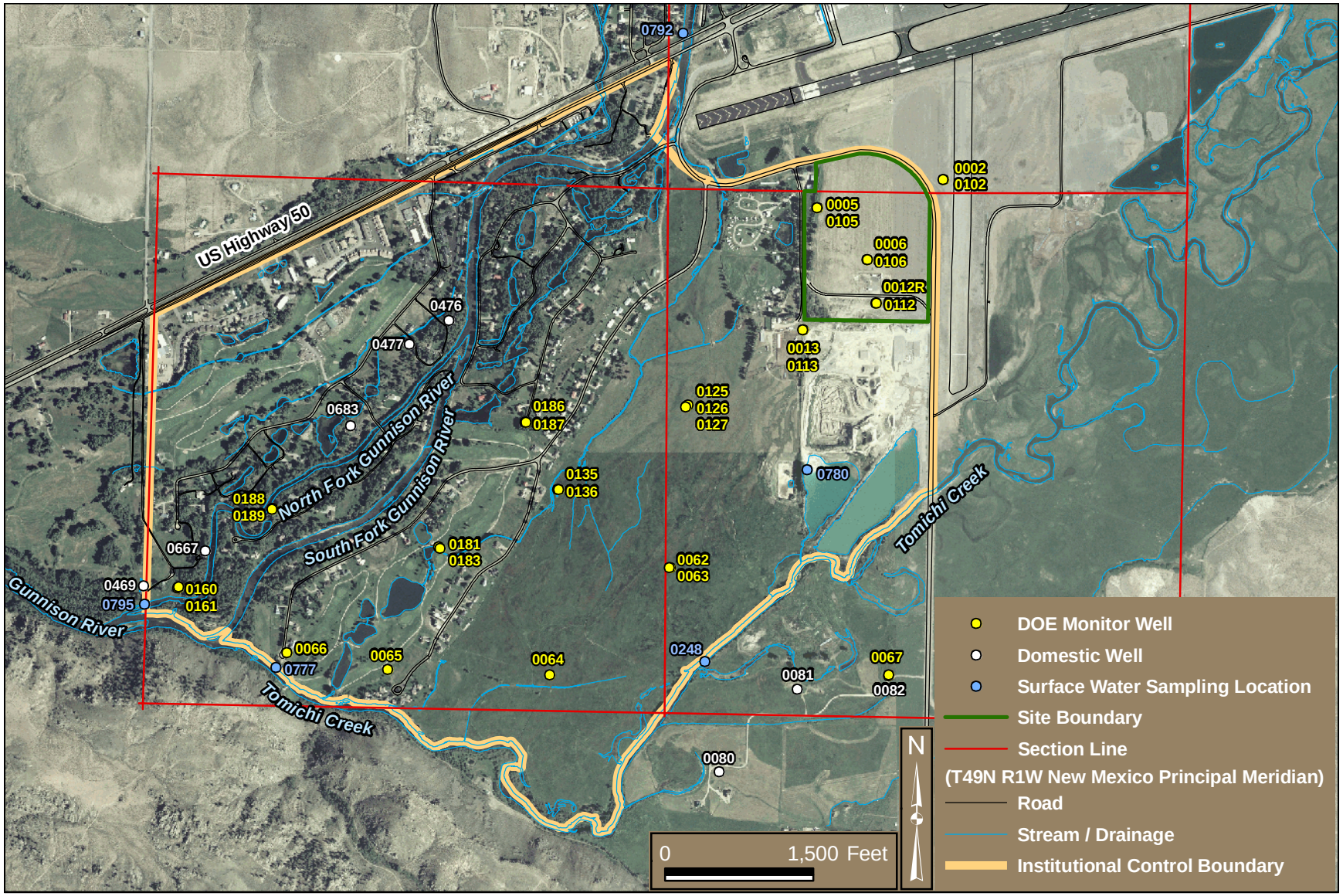
Surface water uranium concentrations were compared to a statistical benchmark derived from location 0792 data, which is located on the Gunnison River upstream from the site. The benchmark value was derived using the mean plus the standard deviation modified by Cohen's method, which adjusts the standard deviation for sample size. The uranium concentration at the Gunnison River downstream location 0795 was less than the benchmark value indicating minimal impact to the Gunnison River from site activities. Uranium concentration at the Valco gravel pit pond (0780) is elevated compared to the benchmark, which is expected because the gravel pit is recharged by contaminated groundwater from the site. Uranium concentrations at Tomichi Creek locations (0248 and 0777) were elevated compared to the benchmark, which is expected because Tomichi Creek receives discharge from the Valco pond.

Table 2. Comparison of Surface Water Uranium Concentrations to the Benchmark Value

Description	Location	Uranium Concentration (mg/L)	Benchmark Value
Tomichi Creek	0248	0.0054	0.0010
	0777	0.0055	
Valco Pond	0780	0.013	
Gunnison River	0795	0.00078	

Sam Campbell
Site Lead, S.M. Stoller

8-5-08
Date



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Gunnison, Colorado, Processing Site Sample Location Map

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Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	Gunnison, Colorado	**Date(s) of Water Sampling**	May 5-7, 2008 plus June 10, 2008
Date(s) of Verification	July 18, 2008	**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 March 28, 2008
2. Were the sampling locations specified in the planning documents sampled?	No	Private well 0468 was not sampled because the homeowner built a wooden deck over the well. Private well 0478 was not sampled because the home is empty and the well is not on. Well 0012 was abandoned and replaced with well 0012R.
3. Was a pre-trip calibration conducted as specified in the above-named documents?	Yes	Pre-trip calibration was performed on May 1, 2008.
4. Was an operational check of the field equipment conducted twice daily?	Yes	Operational checks were performed as required.
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	Wells 0136 and 0189 are category II.
Was one pump/tubing volume removed prior to sampling?	Yes	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	Duplicates were collected from locations 0102 and 0112.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	No	Required for surface water
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were QC samples assigned a fictitious site identification number?	Yes	Location IDs of 2597 and 2598 were used for the duplicate samples collected.
Was the true identity of the samples recorded on the Quality Assurance Sample Log?	Yes	
13. Were samples collected in the containers specified?	Yes	
14. Were samples filtered and preserved as specified?	Yes	
15. Were the number and types of samples collected as specified?	Yes	
16. Were chain of custody records completed and was sample custody maintained?	Yes	
17. Are field data sheets signed and dated by both team members?	Yes	
18. Was all other pertinent information documented on the field data sheets?	Yes	
19. Was the presence or absence of ice in the cooler documented at every sample location?	NA	Ice was not required
20. Were water levels measured at the locations specified in the planning documents?	Yes	

Laboratory Performance Assessment

General Information

Report Number (RIN): 08041519
Sample Event: May 5-7, 2008
Site(s): Gunnison, Colorado
Laboratory: Paragon Analytics, Fort Collins, Colorado
Work Order No.: 0805093
Analysis: Metals
Validator: Steve Donivan
Review Date: July 18, 2008

This validation was performed according to the *Environmental Procedures Catalog*, "Standard Practice for Validation of Laboratory Data," GT-9(P). 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, Mn	LMM-01	SW-846 3005A	SW-846 6010B
Uranium, U	LMM-02	SW-846 3005A	SW-846 6020A

Sample Shipping/Receiving

Paragon Analytics in Fort Collins, Colorado, received 43 water samples on May 9, 2008, accompanied by a Chain of Custody (COC) form. The COC form was checked to confirm that all of the samples were listed on the forms and that signatures and dates were present indicating sample relinquishment and receipt. The sample submittal documents including the COC form, and the sample tickets had no errors or omissions. Copies of the air waybill labels were included with the receiving documentation.

Preservation and Holding Times

The sample shipments were received intact at ambient temperature, 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.

Data Qualifier Summary

The 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	Flag	Reason
0805093-14	0102	Mn	U	Less than 5 times the method blank
0805093-28	0186	Mn	U	Less than 5 times the method blank
0805093-30	0188	Mn	U	Less than 5 times the method blank
0805093-33	0469	Mn	U	Less than 5 times the method blank
0805093-36	0667	Mn	U	Less than 5 times the method blank
0805093-37	0683	Mn	U	Less than 5 times the method blank
0805093-42	0102 dup	Mn	U	Less than 5 times the method blank

Laboratory Instrument Calibration

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

Method SW-846 6010M, Manganese

Calibration was performed for manganese on May 16, 2008. The initial calibrations were performed using one standard and a blank. Calibration and laboratory spike standards were prepared from independent sources. Initial and continuing calibration verification checks were made at the required frequency resulting in 10 CCVs. All initial and continuing calibration verification results were within the acceptance range. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curves near the practical quantitation limit. All check results were within the acceptance range.

Method SW-846 6020A, Uranium

Calibration was performed for uranium on May 16, 2008. The initial calibration was performed using four calibration standards resulting in a calibration curve with a correlation coefficient (r^2) value greater than 0.995. The absolute value of the curve intercept was less than 3 times the method detection limit (MDL). Calibration and laboratory spike standards were prepared from independent sources. Initial and continuing calibration verification checks were made at the required frequency resulting in six CCVs. All initial and continuing calibration verification results were within the acceptance range. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curves near the practical quantitation limit. The check results were within the acceptance range. The mass calibration and resolution was checked at the beginning of each analytical run in accordance with the procedure. Internal standard recoveries were stable and within acceptance ranges.

Method and Calibration Blanks

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. Calibration blanks are analyzed to assess instrument contamination prior to and during sample analysis. All method blank and initial and continuing calibration blank (CCB) results were below the practical quantitation limits for manganese and uranium. In cases where blank concentration exceeds the instrument detection limit, 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.

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) pairs were analyzed for manganese and uranium as a measure of method performance in the sample matrix. The MS/MSD recoveries met the acceptance criteria for both analytes.

Laboratory Replicate Analysis

The relative percent difference values for the laboratory replicate sample results for all analytes were less than twenty percent, indicating acceptable laboratory precision.

Laboratory Control Samples (LCS)

LCS were analyzed at the correct frequency to provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. The LCS results were acceptable for all analysis.

Metals Serial Dilution

Serial dilutions were performed during the metals analysis to monitor physical or chemical interferences that may exist in the sample matrix. Serial dilutions were prepared and analyzed for manganese and uranium. The acceptance criteria were met for both analytes.

Detection Limits/Dilutions

Samples were diluted in a consistent and acceptable manner when required. The samples were diluted prior to analysis of uranium to reduce interferences. The required detection limits were achieved for both analytes.

Completeness

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

Electronic Data Deliverable (EDD) File

The EDD file arrived on June 2, 2008. 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

EDD Non-Conformance Report

Report Date: 7/18/2008

EDD File: 08041519.xml

EDD Errors: No errors detected

Record	Table	Error Type	Field	Error Description

SAMPLE MANAGEMENT SYSTEM

General Data Validation Report

RIN: 08041519 **Lab Code:** PAR **Validator:** Steve Donivan **Validation Date:** 7/18/2008

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

# of Samples: 43 **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	
☑ Field Duplicates	There were 2 duplicates evaluated.

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 08041519 **Lab Code:** PAR **Date Due:** 6/6/2008

Matrix: Water **Site Code:** GUN **Date Completed:** 6/2/2008

Analyte	Date Analyzed	CALIBRATION						Method Blank	LCS %R	MS %R	MSD %R	Dup. RPD	ICSAB %R	Serial Dil. %R	CRI %R
		Int.	R^2	ICV	CCV	ICB	CCB								
MANGANESE	05/16/2008			OK	OK	OK	OK	OK	104.0	99.0	98.0	1.0	95.0	10.0	105.0
MANGANESE	05/16/2008							OK	102.0	101.0	100.0	1.0	92.0	4.0	104.0
MANGANESE	05/16/2008							OK	103.0	99.0	99.0	0.0			
URANIUM	05/16/2008	0.0000	1.0000	OK	OK	OK	OK	OK	109.0	111.0	107.0	3.0	108.0	3.0	116.0
URANIUM	05/16/2008							OK	105.0	106.0	108.0	2.0		4.0	
URANIUM	05/16/2008							OK	107.0	109.0	103.0	3.0		1.0	

General Information

Report Number (RIN): 08041593
Sample Event: June 10, 2008
Site(s): Gunnison, Colorado
Laboratory: Paragon Analytics, Fort Collins, Colorado
Work Order No.: 0806123
Analysis: Metals
Validator: Steve Donivan
Review Date: July 18, 2008

This validation was performed according to the *Environmental Procedures Catalog*, "Standard Practice for Validation of Laboratory Data," GT-9(P). 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 5.

Table 5. Analytes and Methods

Analyte	Line Item Code	Prep Method	Analytical Method
Manganese, Mn	LMM-01	SW-846 3005A	SW-846 6010B
Uranium, U	LMM-02	SW-846 3005A	SW-846 6020A

Sample Shipping/Receiving

Paragon Analytics in Fort Collins, Colorado, received one water sample on June 17, 2008, accompanied by a COC form. The COC form was checked to confirm that the sample was listed on the forms and that signatures and dates were present indicating sample relinquishment and receipt. The sample submittal documents including the COC form and the sample tickets had no errors or omissions. Copies of the air waybill labels were included with the receiving documentation.

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Preservation and Holding Times

The sample shipments were received intact at ambient temperature, 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.

Data Qualifier Summary

None of the analytical results required qualification.

Laboratory Instrument Calibration

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

Method SW-846 6010M, Manganese

Calibration was performed for manganese on June 23, 2008. The initial calibrations were performed using one standard and a blank. Calibration and laboratory spike standards were prepared from independent sources. Initial and continuing calibration verification checks were made at the required frequency resulting in five CCVs. All initial and continuing calibration verification results were within the acceptance range. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curves near the practical quantitation limit. All check results were within the acceptance range.

Method SW-846 6020A, Uranium

Calibration was performed for uranium on June 23, 2008. The initial calibration was performed using four calibration standards resulting in a calibration curve with a correlation coefficient (r^2) value greater than 0.995. The absolute value of the curve intercept was less than 3 times the MDL. Calibration and laboratory spike standards were prepared from independent sources. Initial and continuing calibration verification (CCV) checks were made at the required frequency resulting in five CCVs. All initial and continuing calibration verification results were within the acceptance range. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curves near the practical quantitation limit. All check results were within the acceptance range. The mass calibration and resolution was checked at the beginning of each analytical run in accordance with the procedure. Internal standard recoveries were stable and within acceptance ranges.

Method and Calibration Blanks

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. Calibration blanks are analyzed to assess instrument contamination prior to and during sample analysis. All method blank and initial and CCB results were below the practical quantitation limits for manganese and uranium. In cases where blank concentration exceeds the instrument detection limit, 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.

ICP 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

MS/MSD pairs were analyzed for manganese and uranium as a measure of method performance in the sample matrix. The MS/MSD recoveries met the acceptance criteria for both analytes.

Laboratory Replicate Analysis

The relative percent difference (RPD) values for the laboratory replicate sample results for all analytes were less than twenty percent, indicating acceptable laboratory precision.

Laboratory Control Samples

LCS were analyzed at the correct frequency to provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. The LCS results were acceptable for all analysis.

Metals Serial Dilution

Serial dilutions were performed during the metals analysis to monitor physical or chemical interferences that may exist in the sample matrix. Serial dilutions were prepared and analyzed for manganese and uranium. The acceptance criteria were met for both analytes.

Detection Limits/Dilutions

Samples were diluted in a consistent and acceptable manner when required. The samples were diluted prior to analysis of uranium to reduce interferences. The required detection limits were achieved for both analytes.

Completeness

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

Electronic Data Deliverable File

The EDD file arrived on June 26, 2008. 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

EDD Non-Conformance Report

Report Date: 7/18/2008

EDD File: 08051593.xml

EDD Errors: No errors detected

Record	Table	Error Type	Field	Error Description

SAMPLE MANAGEMENT SYSTEM

General Data Validation Report

RIN: 08051593 **Lab Code:** PAR **Validator:** Steve Donivan **Validation Date:** 7/18/2008

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

# of Samples: 1 **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
- ☑ Detection Limits
- ☐ Field/Trip Blanks
- ☐ Field Duplicates

All analyses were completed within the applicable holding times.

The reported detection limits are equal to or below contract requirements.

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 08051593 **Lab Code:** PAR **Date Due:** 7/1/2008

Matrix: Water **Site Code:** GUN **Date Completed:** 6/27/2008

Analyte	Date Analyzed	CALIBRATION						Method	LCS %R	MS %R	MSD %R	Dup. RPD	ICSAB %R	Serial Dil. %R	CRI %R
		Int.	R^2	ICV	CCV	ICB	CCB	Blank							
MANGANESE	06/23/2008			OK	OK	OK	OK	OK	97.0	92.0	92.0	0.0	91.0	5.0	99.0
URANIUM	06/23/2008	0.0000	1.0000	OK	OK	OK	OK	OK	107.0	105.0	102.0	0.0	107.0	0.0	118.0

Sampling Quality Control Assessment

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

Sampling Protocol

All monitor wells were purged and sampled using Category I criteria with the exception of wells 0136 and 0189 which are Category II. Sample results from the Category II wells were qualified with a "Q" flag in the database indicating results are qualitative based on the sampling protocol used. Sample results from all monitor wells were qualified with an "F" flag in the database indicating the wells were purged and sampled using the low-flow sampling method.

Equipment Blank Assessment

An equipment blank was not collected during this sampling event.

Field Duplicate Assessment

Field duplicate samples were 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 measures only laboratory performance. Duplicate samples were collected from wells 0102 and 0112. The duplicate results were acceptable, meeting the EPA recommended laboratory duplicate criteria of less than 20 percent RPD for results greater than 5 times the reporting limit, demonstrating acceptable overall precision.

SAMPLE MANAGEMENT SYSTEM

Validation Report: Field Duplicates

RIN: 08041519 **Lab Code:** PAR **Project:** Gunnison **Validation Date:** 7/18/2008

Duplicate: 2597 **Sample:** 0102

Analyte	Sample Result	Sample Flag	Sample Error	Duplicate Result	Duplicate Flag	Duplicate Error	RPD	RER	Units
MANGANESE	0.83	B		0.61	B				UG/L
URANIUM	4.4			4.3			2.30		UG/L

Duplicate: 2598 **Sample:** 0112

Analyte	Sample Result	Sample Flag	Sample Error	Duplicate Result	Duplicate Flag	Duplicate Error	RPD	RER	Units
MANGANESE	5500			5800			5.31		UG/L
URANIUM	36			36			0		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: 8-1-08

Data Validation Lead: Steve Donivan — Date: 8-1-2008

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 all new data that fall outside the historical data range. Data listed in the report are highlighted if the concentration detected is not within 50 percent of historical minimum or maximum values. 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 manganese results from locations 0181 and 0795, and the uranium result from location 0469 were identified as potential outliers. The field data and laboratory data for these locations were reviewed with no errors identified. Additionally, the laboratory ran the sample from location 0795 in duplicate with repeatable results. These data are listed on the Anomalous Data Review Checksheet for comparison to future data.

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Data Validation Outliers Report - No Field Parameters
Laboratory: PARAGON (Fort Collins, CO)
RIN: 08041519
Comparison: All Historical Data
Report Date: 7/18/2008

				Current			Historical Maximum			Historical Minimum			Count		Normally Distributed	Statistical Outlier
					Qualifiers			Qualifiers			Qualifiers					
Site Code	Location Code	Sample Date	Analyte	Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect		
GUN01	0081	05/06/2008	Manganese	0.36			0.285		F	0.058			7	0	No	No
GUN01	0127	05/06/2008	Uranium	0.02		F	0.053			0.026		F	25	0	Yes	No
GUN01	0161	05/05/2008	Uranium	0.019		F	0.018		F	0.003	U		25	1	Yes	No
GUN01	0181	05/07/2008	Manganese	0.89		F	0.387			0.01	U		28	1	No	Yes
GUN01	0187	05/05/2008	Manganese	1.2		F	10			1.21			18	0	No	No
GUN01	0189	05/05/2008	Uranium	0.017		FQ	0.016		F	0.011	N		26	0	No	No
GUN01	0469	05/05/2008	Uranium	0.00064			0.004		J	0.00098	BE		18	1	Yes (log)	Yes
GUN01	0795	05/05/2008	Manganese	0.032			0.0184			0.0068	B		15	0	Yes	Yes

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.		

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.

Anomalous Data Review Checksheet

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Anomalous Data Review Checksheet

Site: Gunnison, Colorado Processing Site **Sampling Data:** Groundwater and surface water

Reviewer:	Steve Donivan Name (print)	Steve Donivan Signature	8-1-2008 Date
Site Hydrologist:	Sam Campbell Name (print)	Sam Campbell Signature	8-5-08 Date

Date of Review: July 18, 2008

Loc. No.	Analyte	Type of Anomaly	Disposition
0181	Manganese	High	Compare to future results
0469	Uranium	Low	Compare to future results
0795	Manganese	High	Compare to future results

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Attachment 2
Data Presentation

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Groundwater Quality Data

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Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0002 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/06/2008	N001	10	-	15	205		F	#		
Manganese	mg/L	05/06/2008	N001	10	-	15	0.0046	B	F	#	0.00013	
Oxidation Reduction Potential	mV	05/06/2008	N001	10	-	15	-11		F	#		
pH	s.u.	05/06/2008	N001	10	-	15	7.13		F	#		
Specific Conductance	umhos /cm	05/06/2008	N001	10	-	15	1090		F	#		
Temperature	C	05/06/2008	N001	10	-	15	9.7		F	#		
Turbidity	NTU	05/06/2008	N001	10	-	15	1.84		F	#		
Uranium	mg/L	05/06/2008	N001	10	-	15	0.0039		F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0005 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/07/2008	N001	10	-	15	261		F	#		
Manganese	mg/L	05/07/2008	N001	10	-	15	0.47		F	#	0.00013	
Oxidation Reduction Potential	mV	05/07/2008	N001	10	-	15	-153		F	#		
pH	s.u.	05/07/2008	N001	10	-	15	7.26		F	#		
Specific Conductance	umhos /cm	05/07/2008	N001	10	-	15	687		F	#		
Temperature	C	05/07/2008	N001	10	-	15	7.9		F	#		
Turbidity	NTU	05/07/2008	N001	10	-	15	9.98		F	#		
Uranium	mg/L	05/07/2008	N001	10	-	15	0.06		F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0006 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/07/2008	N001	10	-	15	157		F	#		
Manganese	mg/L	05/07/2008	N001	10	-	15	0.076		F	#	0.00013	
Oxidation Reduction Potential	mV	05/07/2008	N001	10	-	15	-122		F	#		
pH	s.u.	05/07/2008	N001	10	-	15	7.07		F	#		
Specific Conductance	umhos /cm	05/07/2008	N001	10	-	15	2319		F	#		
Temperature	C	05/07/2008	N001	10	-	15	7.6		F	#		
Turbidity	NTU	05/07/2008	N001	10	-	15	4.99		F	#		
Uranium	mg/L	05/07/2008	N001	10	-	15	0.76		F	#	0.001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0012R WELL Replacement well for 0012, broken casing, decommissioned

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	06/10/2008	N001	-	0.1			#	0.00013	
Oxidation Reduction Potential	mV	06/10/2008	N001	-	90.9			#		
pH	s.u.	06/10/2008	N001	-	6.82			#		
Specific Conductance	umhos /cm	06/10/2008	N001	-	1474			#		
Temperature	C	06/10/2008	N001	-	10.48			#		
Turbidity	NTU	06/10/2008	N001	-	2.87			#		
Uranium	mg/L	06/10/2008	N001	-	0.37			#	0.001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0013 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/06/2008	N001	11	-	16	243		F	#		
Manganese	mg/L	05/06/2008	N001	11	-	16	0.024		F	#	0.00013	
Oxidation Reduction Potential	mV	05/06/2008	N001	11	-	16	-47		F	#		
pH	s.u.	05/06/2008	N001	11	-	16	7.4		F	#		
Specific Conductance	umhos /cm	05/06/2008	N001	11	-	16	712		F	#		
Temperature	C	05/06/2008	N001	11	-	16	9.1		F	#		
Turbidity	NTU	05/06/2008	N001	11	-	16	1.39		F	#		
Uranium	mg/L	05/06/2008	N001	11	-	16	0.028		F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0062 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/06/2008	N001	47.9	-	57.9	209		F	#		
Manganese	mg/L	05/06/2008	N001	47.9	-	57.9	0.0047	B	F	#	0.00013	
Oxidation Reduction Potential	mV	05/06/2008	N001	47.9	-	57.9	-59		F	#		
pH	s.u.	05/06/2008	N001	47.9	-	57.9	7.45		F	#		
Specific Conductance	umhos /cm	05/06/2008	N001	47.9	-	57.9	541		F	#		
Temperature	C	05/06/2008	N001	47.9	-	57.9	8.6		F	#		
Turbidity	NTU	05/06/2008	N001	47.9	-	57.9	2.79		F	#		
Uranium	mg/L	05/06/2008	N001	47.9	-	57.9	0.0089		F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0063 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/06/2008	N001	87.9	-	97.9	192		F	#		
Manganese	mg/L	05/06/2008	N001	87.9	-	97.9	0.014		F	#	0.00013	
Oxidation Reduction Potential	mV	05/06/2008	N001	87.9	-	97.9	-65		F	#		
pH	s.u.	05/06/2008	N001	87.9	-	97.9	7.47		F	#		
Specific Conductance	umhos /cm	05/06/2008	N001	87.9	-	97.9	487		F	#		
Temperature	C	05/06/2008	N001	87.9	-	97.9	9		F	#		
Turbidity	NTU	05/06/2008	N001	87.9	-	97.9	3.56		F	#		
Uranium	mg/L	05/06/2008	N001	87.9	-	97.9	0.011		F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0064 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/06/2008	N001	86.7	-	96.7	207		F	#		
Manganese	mg/L	05/06/2008	N001	86.7	-	96.7	0.032		F	#	0.00013	
Oxidation Reduction Potential	mV	05/06/2008	N001	86.7	-	96.7	-44		F	#		
pH	s.u.	05/06/2008	N001	86.7	-	96.7	7.34		F	#		
Specific Conductance	umhos /cm	05/06/2008	N001	86.7	-	96.7	513		F	#		
Temperature	C	05/06/2008	N001	86.7	-	96.7	9.3		F	#		
Turbidity	NTU	05/06/2008	N001	86.7	-	96.7	4.22		F	#		
Uranium	mg/L	05/06/2008	N001	86.7	-	96.7	0.013		F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0065 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/06/2008	N001	49.7	-	59.7	256		F	#		
Manganese	mg/L	05/06/2008	N001	49.7	-	59.7	0.034		F	#	0.00013	
Oxidation Reduction Potential	mV	05/06/2008	N001	49.7	-	59.7	-36		F	#		
pH	s.u.	05/06/2008	N001	49.7	-	59.7	7.44		F	#		
Specific Conductance	umhos /cm	05/06/2008	N001	49.7	-	59.7	743		F	#		
Temperature	C	05/06/2008	N001	49.7	-	59.7	9.1		F	#		
Turbidity	NTU	05/06/2008	N001	49.7	-	59.7	7.99		F	#		
Uranium	mg/L	05/06/2008	N001	49.7	-	59.7	0.033		F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0066 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/05/2008	N001	40.2	-	50.2	215		F	#		
Manganese	mg/L	05/05/2008	N001	40.2	-	50.2	0.019		F	#	0.00013	
Oxidation Reduction Potential	mV	05/05/2008	N001	40.2	-	50.2	-74		F	#		
pH	s.u.	05/05/2008	N001	40.2	-	50.2	7.25		F	#		
Specific Conductance	umhos /cm	05/05/2008	N001	40.2	-	50.2	701		F	#		
Temperature	C	05/05/2008	N001	40.2	-	50.2	9.7		F	#		
Turbidity	NTU	05/05/2008	N001	40.2	-	50.2	2		F	#		
Uranium	mg/L	05/05/2008	N001	40.2	-	50.2	0.024		F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0067 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/06/2008	N001	39.67	-	49.67	225		F	#		
Manganese	mg/L	05/06/2008	N001	39.67	-	49.67	0.0091		F	#	0.00013	
Oxidation Reduction Potential	mV	05/06/2008	N001	39.67	-	49.67	-77		F	#		
pH	s.u.	05/06/2008	N001	39.67	-	49.67	7.19		F	#		
Specific Conductance	umhos /cm	05/06/2008	N001	39.67	-	49.67	486		F	#		
Temperature	C	05/06/2008	N001	39.67	-	49.67	9.5		F	#		
Turbidity	NTU	05/06/2008	N001	39.67	-	49.67	3.48		F	#		
Uranium	mg/L	05/06/2008	N001	39.67	-	49.67	0.011		F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0080 WELL Key to pump house for well 080 can be obtained from house to the southwest, if needed.

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/06/2008	N001	-	223			#		
Manganese	mg/L	05/06/2008	N001	-	0.11			#	0.00013	
Oxidation Reduction Potential	mV	05/06/2008	N001	-	-98			#		
pH	s.u.	05/06/2008	N001	-	7.21			#		
Specific Conductance	umhos /cm	05/06/2008	N001	-	469			#		
Temperature	C	05/06/2008	N001	-	10.6			#		
Turbidity	NTU	05/06/2008	N001	-	2.46			#		
Uranium	mg/L	05/06/2008	N001	-	0.0037			#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0081 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/06/2008	N001	-	178			#		
Manganese	mg/L	05/06/2008	N001	-	0.36			#	0.00013	
Oxidation Reduction Potential	mV	05/06/2008	N001	-	-177			#		
pH	s.u.	05/06/2008	N001	-	7.65			#		
Specific Conductance	umhos /cm	05/06/2008	N001	-	374			#		
Temperature	C	05/06/2008	N001	-	6.6			#		
Turbidity	NTU	05/06/2008	N001	-	2.34			#		
Uranium	mg/L	05/06/2008	N001	-	0.0009			#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0082 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/06/2008	N001	-	270			#		
Manganese	mg/L	05/06/2008	N001	-	0.15			#	0.00013	
Oxidation Reduction Potential	mV	05/06/2008	N001	-	-140			#		
pH	s.u.	05/06/2008	N001	-	7.3			#		
Specific Conductance	umhos /cm	05/06/2008	N001	-	527			#		
Temperature	C	05/06/2008	N001	-	9.3			#		
Turbidity	NTU	05/06/2008	N001	-	2.44			#		
Uranium	mg/L	05/06/2008	N001	-	0.0042			#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0102 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/06/2008	N001	42	-	47	254		F	#		
Manganese	mg/L	05/06/2008	N001	42	-	47	0.00083	B	UF	#	0.00013	
Manganese	mg/L	05/06/2008	N002	42	-	47	0.00061	B	UF	#	0.00013	
Oxidation Reduction Potential	mV	05/06/2008	N001	42	-	47	-58		F	#		
pH	s.u.	05/06/2008	N001	42	-	47	7.45		F	#		
Specific Conductance	umhos /cm	05/06/2008	N001	42	-	47	584		F	#		
Temperature	C	05/06/2008	N001	42	-	47	12.7		F	#		
Turbidity	NTU	05/06/2008	N001	42	-	47	1.01		F	#		
Uranium	mg/L	05/06/2008	N001	42	-	47	0.0044		F	#	0.0001	
Uranium	mg/L	05/06/2008	N002	42	-	47	0.0043		F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0105 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/07/2008	N001	42	-	47	188		F	#		
Manganese	mg/L	05/07/2008	N001	42	-	47	3.5		F	#	0.00013	
Oxidation Reduction Potential	mV	05/07/2008	N001	42	-	47	-146		F	#		
pH	s.u.	05/07/2008	N001	42	-	47	6.85		F	#		
Specific Conductance	umhos /cm	05/07/2008	N001	42	-	47	536		F	#		
Temperature	C	05/07/2008	N001	42	-	47	9.6		F	#		
Turbidity	NTU	05/07/2008	N001	42	-	47	3.54		F	#		
Uranium	mg/L	05/07/2008	N001	42	-	47	0.016		F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0106 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/07/2008	N001	34	-	39	77		F	#		
Manganese	mg/L	05/07/2008	N001	34	-	39	6.5		F	#	0.00013	
Oxidation Reduction Potential	mV	05/07/2008	N001	34	-	39	-173		F	#		
pH	s.u.	05/07/2008	N001	34	-	39	5.95		F	#		
Specific Conductance	umhos /cm	05/07/2008	N001	34	-	39	1946		F	#		
Temperature	C	05/07/2008	N001	34	-	39	9.6		F	#		
Turbidity	NTU	05/07/2008	N001	34	-	39	4.37		F	#		
Uranium	mg/L	05/07/2008	N001	34	-	39	0.01		F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0112 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/07/2008	N001	40	-	45	128		F	#		
Manganese	mg/L	05/07/2008	N001	40	-	45	5.5		F	#	0.00013	
Manganese	mg/L	05/07/2008	N002	40	-	45	5.8		F	#	0.00013	
Oxidation Reduction Potential	mV	05/07/2008	N001	40	-	45	-214		F	#		
pH	s.u.	05/07/2008	N001	40	-	45	6.27		F	#		
Specific Conductance	umhos /cm	05/07/2008	N001	40	-	45	976		F	#		
Temperature	C	05/07/2008	N001	40	-	45	9.5		F	#		
Turbidity	NTU	05/07/2008	N001	40	-	45	1.47		F	#		
Uranium	mg/L	05/07/2008	N001	40	-	45	0.036		F	#	0.0001	
Uranium	mg/L	05/07/2008	N002	40	-	45	0.036		F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0113 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/06/2008	N001	41	-	46	224		F	#		
Manganese	mg/L	05/06/2008	N001	41	-	46	1.6		F	#	0.00013	
Oxidation Reduction Potential	mV	05/06/2008	N001	41	-	46	-47		F	#		
pH	s.u.	05/06/2008	N001	41	-	46	7.07		F	#		
Specific Conductance	umhos /cm	05/06/2008	N001	41	-	46	552		F	#		
Temperature	C	05/06/2008	N001	41	-	46	10.7		F	#		
Turbidity	NTU	05/06/2008	N001	41	-	46	1.74		F	#		
Uranium	mg/L	05/06/2008	N001	41	-	46	0.096		F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0125 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/06/2008	N001	17.8	-	22.8	216		F	#		
Manganese	mg/L	05/06/2008	N001	17.8	-	22.8	0.035		F	#	0.00013	
Oxidation Reduction Potential	mV	05/06/2008	N001	17.8	-	22.8	-160		F	#		
pH	s.u.	05/06/2008	N001	17.8	-	22.8	7.33		F	#		
Specific Conductance	umhos /cm	05/06/2008	N001	17.8	-	22.8	483		F	#		
Temperature	C	05/06/2008	N001	17.8	-	22.8	8.3		F	#		
Turbidity	NTU	05/06/2008	N001	17.8	-	22.8	1.18		F	#		
Uranium	mg/L	05/06/2008	N001	17.8	-	22.8	0.0082		F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0126 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/06/2008	N001	54	-	59	223		F	#		
Manganese	mg/L	05/06/2008	N001	54	-	59	0.022		F	#	0.00013	
Oxidation Reduction Potential	mV	05/06/2008	N001	54	-	59	-174		F	#		
pH	s.u.	05/06/2008	N001	54	-	59	7.35		F	#		
Specific Conductance	umhos /cm	05/06/2008	N001	54	-	59	643		F	#		
Temperature	C	05/06/2008	N001	54	-	59	8.9		F	#		
Turbidity	NTU	05/06/2008	N001	54	-	59	2.14		F	#		
Uranium	mg/L	05/06/2008	N001	54	-	59	0.012		F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0127 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/06/2008	N001	94	-	99	249		F	#		
Manganese	mg/L	05/06/2008	N001	94	-	99	0.0096		F	#	0.00013	
Oxidation Reduction Potential	mV	05/06/2008	N001	94	-	99	-205		F	#		
pH	s.u.	05/06/2008	N001	94	-	99	7.45		F	#		
Specific Conductance	umhos /cm	05/06/2008	N001	94	-	99	776		F	#		
Temperature	C	05/06/2008	N001	94	-	99	8.1		F	#		
Turbidity	NTU	05/06/2008	N001	94	-	99	4.61		F	#		
Uranium	mg/L	05/06/2008	N001	94	-	99	0.02		F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0135 WELL Well is knocked over!!

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/06/2008	N001	18	-	23	161		F	#		
Manganese	mg/L	05/06/2008	N001	18	-	23	3.5		F	#	0.00013	
Oxidation Reduction Potential	mV	05/06/2008	N001	18	-	23	-63		F	#		
pH	s.u.	05/06/2008	N001	18	-	23	6.83		F	#		
Specific Conductance	umhos /cm	05/06/2008	N001	18	-	23	412		F	#		
Temperature	C	05/06/2008	N001	18	-	23	7.9		F	#		
Turbidity	NTU	05/06/2008	N001	18	-	23	4.22		F	#		
Uranium	mg/L	05/06/2008	N001	18	-	23	0.0013		F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0136 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/06/2008	N001	53	-	58	161		FQ	#		
Manganese	mg/L	05/06/2008	N001	53	-	58	0.13		FQ	#	0.00013	
Oxidation Reduction Potential	mV	05/06/2008	N001	53	-	58	-72		FQ	#		
pH	s.u.	05/06/2008	N001	53	-	58	8.5		FQ	#		
Specific Conductance	umhos /cm	05/06/2008	N001	53	-	58	585		FQ	#		
Temperature	C	05/06/2008	N001	53	-	58	9.1		FQ	#		
Turbidity	NTU	05/06/2008	N001	53	-	58	21.5		FQ	#		
Uranium	mg/L	05/06/2008	N001	53	-	58	0.018		FQ	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0160 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/05/2008	N001	51	-	56	276		F	#		
Manganese	mg/L	05/05/2008	N001	51	-	56	0.091		F	#	0.00013	
Oxidation Reduction Potential	mV	05/05/2008	N001	51	-	56	10		F	#		
pH	s.u.	05/05/2008	N001	51	-	56	6.61		F	#		
Specific Conductance	umhos /cm	05/05/2008	N001	51	-	56	836		F	#		
Temperature	C	05/05/2008	N001	51	-	56	9.3		F	#		
Turbidity	NTU	05/05/2008	N001	51	-	56	3.6		F	#		
Uranium	mg/L	05/05/2008	N001	51	-	56	0.024		F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0161 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/05/2008	N001	93	-	98	227		F	#		
Manganese	mg/L	05/05/2008	N001	93	-	98	0.011		F	#	0.00013	
Oxidation Reduction Potential	mV	05/05/2008	N001	93	-	98	19		F	#		
pH	s.u.	05/05/2008	N001	93	-	98	6.61		F	#		
Specific Conductance	umhos /cm	05/05/2008	N001	93	-	98	839		F	#		
Temperature	C	05/05/2008	N001	93	-	98	9		F	#		
Turbidity	NTU	05/05/2008	N001	93	-	98	3.01		F	#		
Uranium	mg/L	05/05/2008	N001	93	-	98	0.019		F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0181 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/07/2008	N001	18	-	23	210		F	#		
Manganese	mg/L	05/07/2008	N001	18	-	23	0.89		F	#	0.00013	
Oxidation Reduction Potential	mV	05/07/2008	N001	18	-	23	-220		F	#		
pH	s.u.	05/07/2008	N001	18	-	23	7.32		F	#		
Specific Conductance	umhos /cm	05/07/2008	N001	18	-	23	642		F	#		
Temperature	C	05/07/2008	N001	18	-	23	6.7		F	#		
Turbidity	NTU	05/07/2008	N001	18	-	23	7.16		F	#		
Uranium	mg/L	05/07/2008	N001	18	-	23	0.014		F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0183 WELL Casing bent.

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/07/2008	N001	93	-	98	304		F	#		
Manganese	mg/L	05/07/2008	N001	93	-	98	0.0062		F	#	0.00013	
Oxidation Reduction Potential	mV	05/07/2008	N001	93	-	98	-203		F	#		
pH	s.u.	05/07/2008	N001	93	-	98	6.73		F	#		
Specific Conductance	umhos /cm	05/07/2008	N001	93	-	98	1146		F	#		
Temperature	C	05/07/2008	N001	93	-	98	7.3		F	#		
Turbidity	NTU	05/07/2008	N001	93	-	98	8.9		F	#		
Uranium	mg/L	05/07/2008	N001	93	-	98	0.064		F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0186 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/05/2008	N001	53	-	58	297		F	#		
Manganese	mg/L	05/05/2008	N001	53	-	58	0.0012	B	UF	#	0.00013	
Oxidation Reduction Potential	mV	05/05/2008	N001	53	-	58	-92		F	#		
pH	s.u.	05/05/2008	N001	53	-	58	7.41		F	#		
Specific Conductance	umhos /cm	05/05/2008	N001	53	-	58	691		F	#		
Temperature	C	05/05/2008	N001	53	-	58	9.2		F	#		
Turbidity	NTU	05/05/2008	N001	53	-	58	1.94		F	#		
Uranium	mg/L	05/05/2008	N001	53	-	58	0.019		F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0187 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/05/2008	N001	93	-	98	576		F	#		
Manganese	mg/L	05/05/2008	N001	93	-	98	1.2		F	#	0.00013	
Oxidation Reduction Potential	mV	05/05/2008	N001	93	-	98	-115		F	#		
pH	s.u.	05/05/2008	N001	93	-	98	6.51		F	#		
Specific Conductance	umhos /cm	05/05/2008	N001	93	-	98	1293		F	#		
Temperature	C	05/05/2008	N001	93	-	98	9.2		F	#		
Turbidity	NTU	05/05/2008	N001	93	-	98	8.79		F	#		
Uranium	mg/L	05/05/2008	N001	93	-	98	0.026		F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0188 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/05/2008	N001	53	-	58	290		F	#		
Manganese	mg/L	05/05/2008	N001	53	-	58	0.002	B	UF	#	0.00013	
Oxidation Reduction Potential	mV	05/05/2008	N001	53	-	58	145.5		F	#		
pH	s.u.	05/05/2008	N001	53	-	58	7.05		F	#		
Specific Conductance	umhos /cm	05/05/2008	N001	53	-	58	808		F	#		
Temperature	C	05/05/2008	N001	53	-	58	8.26		F	#		
Turbidity	NTU	05/05/2008	N001	53	-	58	2.31		F	#		
Uranium	mg/L	05/05/2008	N001	53	-	58	0.037		F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0189 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/05/2008	N001	93	-	98	981		FQ	#		
Manganese	mg/L	05/05/2008	N001	93	-	98	0.85		FQ	#	0.00013	
Oxidation Reduction Potential	mV	05/05/2008	N001	93	-	98	18.3		FQ	#		
pH	s.u.	05/05/2008	N001	93	-	98	6.33		FQ	#		
Specific Conductance	umhos /cm	05/05/2008	N001	93	-	98	2086		FQ	#		
Temperature	C	05/05/2008	N001	93	-	98	8.42		FQ	#		
Turbidity	NTU	05/05/2008	N001	93	-	98	6.18		FQ	#		
Uranium	mg/L	05/05/2008	N001	93	-	98	0.017		FQ	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0469 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/05/2008	N001	-	80			#		
Manganese	mg/L	05/05/2008	N001	-	0.0015	B	U	#	0.00013	
Oxidation Reduction Potential	mV	05/05/2008	N001	-	15			#		
pH	s.u.	05/05/2008	N001	-	8.14			#		
Specific Conductance	umhos /cm	05/05/2008	N001	-	231			#		
Temperature	C	05/05/2008	N001	-	15.2			#		
Turbidity	NTU	05/05/2008	N001	-	2.52			#		
Uranium	mg/L	05/05/2008	N001	-	0.00064			#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0476 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/05/2008	N001	-	110			#		
Manganese	mg/L	05/05/2008	N001	-	0.0045	B		#	0.00013	
Oxidation Reduction Potential	mV	05/05/2008	N001	-	-29			#		
pH	s.u.	05/05/2008	N001	-	7.29			#		
Specific Conductance	umhos /cm	05/05/2008	N001	-	242			#		
Temperature	C	05/05/2008	N001	-	12.6			#		
Turbidity	NTU	05/05/2008	N001	-	2.19			#		
Uranium	mg/L	05/05/2008	N001	-	0.0016			#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0477 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/05/2008	N001	-	119			#		
Manganese	mg/L	05/05/2008	N001	-	0.017			#	0.00013	
Oxidation Reduction Potential	mV	05/05/2008	N001	-	-48			#		
pH	s.u.	05/05/2008	N001	-	7.52			#		
Specific Conductance	umhos /cm	05/05/2008	N001	-	258			#		
Temperature	C	05/05/2008	N001	-	10.8			#		
Turbidity	NTU	05/05/2008	N001	-	1.79			#		
Uranium	mg/L	05/05/2008	N001	-	0.00058			#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0667 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/05/2008	N001	-	101			#		
Manganese	mg/L	05/05/2008	N001	-	0.0015	B	U	#	0.00013	
Oxidation Reduction Potential	mV	05/05/2008	N001	-	28			#		
pH	s.u.	05/05/2008	N001	-	7.25			#		
Specific Conductance	umhos /cm	05/05/2008	N001	-	266			#		
Temperature	C	05/05/2008	N001	-	10			#		
Turbidity	NTU	05/05/2008	N001	-	1.89			#		
Uranium	mg/L	05/05/2008	N001	-	0.0023			#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0683 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/05/2008	N001	-	124			#		
Manganese	mg/L	05/05/2008	N001	-	0.0015	B	U	#	0.00013	
Oxidation Reduction Potential	mV	05/05/2008	N001	-	26			#		
pH	s.u.	05/05/2008	N001	-	7.78			#		
Specific Conductance	umhos /cm	05/05/2008	N001	-	313			#		
Temperature	C	05/05/2008	N001	-	11			#		
Turbidity	NTU	05/05/2008	N001	-	2.66			#		
Uranium	mg/L	05/05/2008	N001	-	0.001			#	0.0001	

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 GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0248 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/05/2008	N001	88			#		
Manganese	mg/L	05/05/2008	N001	0.091			#	0.00013	
Oxidation Reduction Potential	mV	05/05/2008	N001	-25			#		
pH	s.u.	05/05/2008	N001	7.96			#		
Specific Conductance	umhos/cm	05/05/2008	N001	239			#		
Temperature	C	05/05/2008	N001	11.3			#		
Turbidity	NTU	05/05/2008	N001	9.86			#		
Uranium	mg/L	05/05/2008	N001	0.0054			#	0.0001	

Surface Water Quality Data by Location (USEE102) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0777 SURFACE LOCATION Tomichi Creek SSE of well 0058

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/05/2008	N001	87			#		
Manganese	mg/L	05/05/2008	N001	0.11			#	0.00013	
Oxidation Reduction Potential	mV	05/05/2008	N001	-30			#		
pH	s.u.	05/05/2008	N001	7.41			#		
Specific Conductance	umhos/cm	05/05/2008	N001	272			#		
Temperature	C	05/05/2008	N001	12.6			#		
Turbidity	NTU	05/05/2008	N001	9.72			#		
Uranium	mg/L	05/05/2008	N001	0.0055			#	0.0001	

Surface Water Quality Data by Location (USEE102) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0780 SURFACE LOCATION NE CORNER VALCO PIT

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/06/2008	N001	82			#		
Manganese	mg/L	05/06/2008	N001	0.0051			#	0.00013	
Oxidation Reduction Potential	mV	05/06/2008	N001	64			#		
pH	s.u.	05/06/2008	N001	8.75			#		
Specific Conductance	umhos/cm	05/06/2008	N001	356			#		
Temperature	C	05/06/2008	N001	14.3			#		
Turbidity	NTU	05/06/2008	N001	3.12			#		
Uranium	mg/L	05/06/2008	N001	0.013			#	0.0001	

Surface Water Quality Data by Location (USEE102) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0792 SURFACE LOCATION KMONKS, SURFACE LOCATION, 8/11/94

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/05/2008	N001	75			#		
Manganese	mg/L	05/05/2008	N001	0.031			#	0.00013	
Oxidation Reduction Potential	mV	05/05/2008	N001	51			#		
pH	s.u.	05/05/2008	N001	7.97			#		
Specific Conductance	umhos/cm	05/05/2008	N001	215			#		
Temperature	C	05/05/2008	N001	9.5			#		
Turbidity	NTU	05/05/2008	N001	7.28			#		
Uranium	mg/L	05/05/2008	N001	0.00075			#	0.0001	

Surface Water Quality Data by Location (USEE102) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008
Location: 0795 SURFACE LOCATION KMONKS, SURFACE LOCATION, 8/11/94

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	05/05/2008	N001	78			#		
Manganese	mg/L	05/05/2008	N001	0.032			#	0.00013	
Oxidation Reduction Potential	mV	05/05/2008	N001	5.7			#		
pH	s.u.	05/05/2008	N001	8.23			#		
Specific Conductance	umhos/cm	05/05/2008	N001	200			#		
Temperature	C	05/05/2008	N001	9.7			#		
Turbidity	NTU	05/05/2008	N001	5.63			#		
Uranium	mg/L	05/05/2008	N001	0.00078			#	0.0001	

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.

Static Water Level Data

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STATIC WATER LEVELS (USEE700) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008

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
0002	U	7646.75	05/06/2008		3.2	7643.55	
0005	O	7644.66	05/07/2008		4.7	7639.96	
0006	O	7647.19	05/07/2008		9.32	7637.87	
0012R			06/10/2008		10.14	-10.14	
0013	D	7643.75	05/06/2008		10.57	7633.18	
0062	O	7630.61	05/06/2008		6.74	7623.87	
0063	O	7630.34	05/06/2008		7.76	7622.58	
0064	O	7620.76	05/06/2008		6.69	7614.07	
0065	O	7610.27	05/06/2008		1.98	7608.29	
0066	O	7606.22	05/05/2008		1.48	7604.74	
0067	O	7628.96	05/06/2008		2	7626.96	
0081			05/06/2008		3.54	-3.54	
0082			05/06/2008		2.25	-2.25	
0102	U	7647.3	05/06/2008		4.08	7643.22	
0105	O	7646.11	05/07/2008		6.84	7639.27	
0106	O	7647.3	05/07/2008		9.6	7637.7	
0112	O	7644.84	05/07/2008		10.72	7634.12	
0113	D	7643.83	05/06/2008		10.79	7633.04	
0125	D	7633.52	05/06/2008		6.15	7627.37	
0126	D	7634.14	05/06/2008		6.51	7627.63	
0127	D	7634.64	05/06/2008		8.24	7626.4	
0135	D	7627.03	05/06/2008		5.82	7621.21	
0136	D	7626.24	05/06/2008		5.87	7620.37	
0160	D	7604.39	05/05/2008		4.81	7599.58	
0161	D	7605.63	05/05/2008		6.25	7599.38	
0181	D	7619.07	05/07/2008		2.39	7616.68	
0183	D	7617.82	05/07/2008		4.41	7613.41	
0186	D	7627.21	05/05/2008		6.12	7621.09	
0187	D	7625.91	05/05/2008		5.61	7620.3	

STATIC WATER LEVELS (USEE700) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/18/2008

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
0188	D	7613.65	05/05/2008		5.57	7608.08	
0189	D	7613.56	05/05/2008		6.2	7607.36	

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

Time-Concentration Graphs

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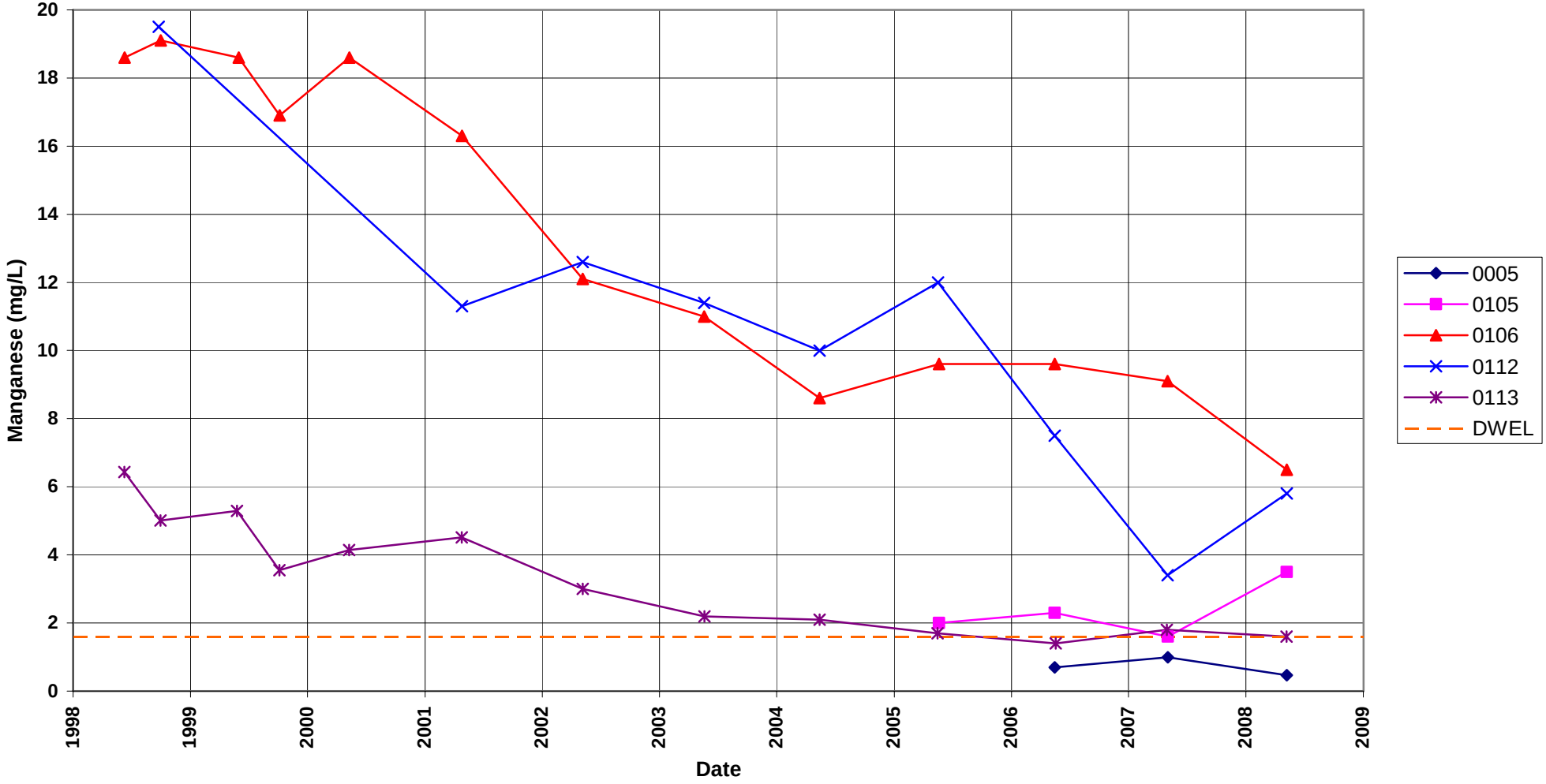
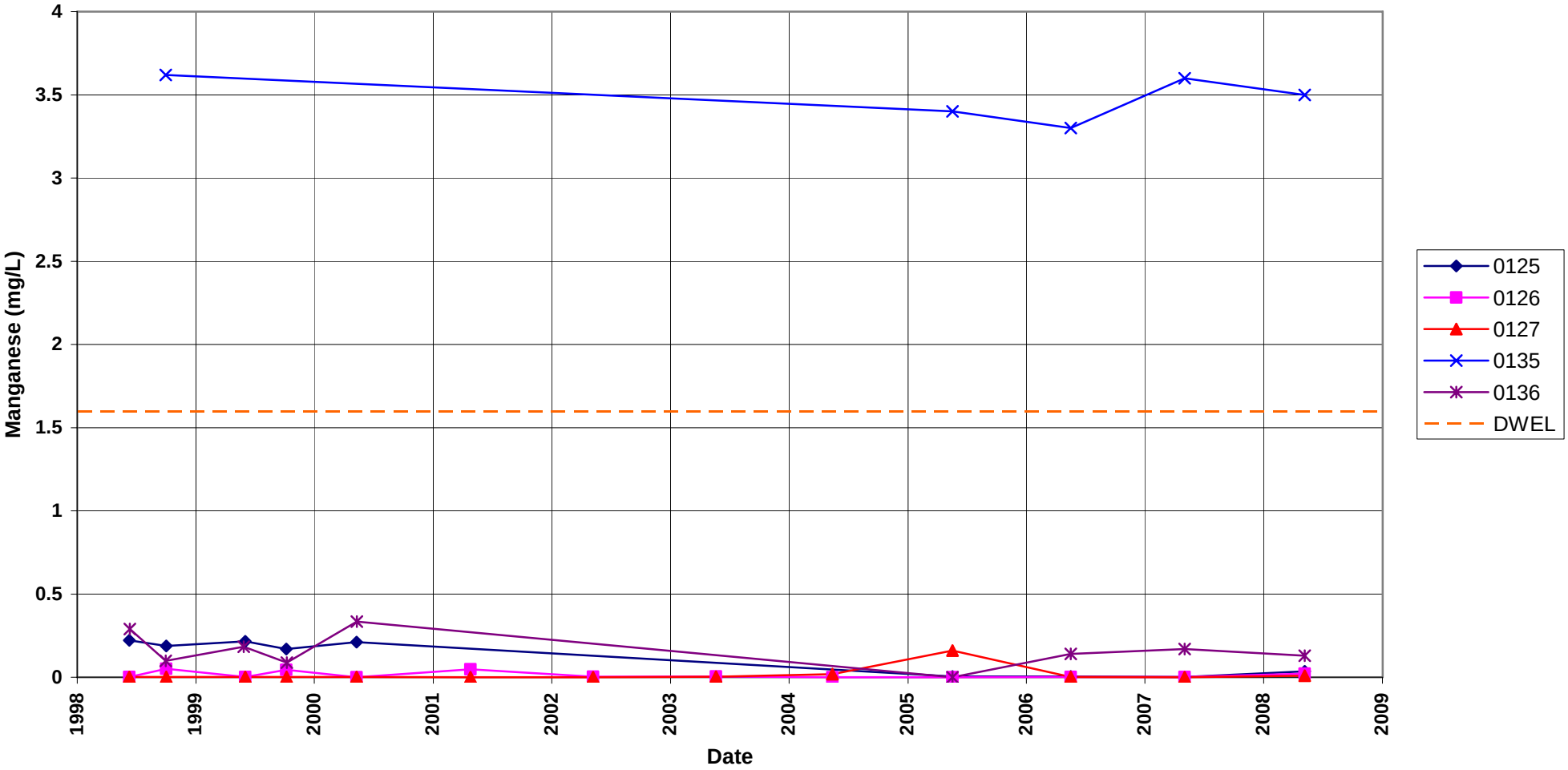
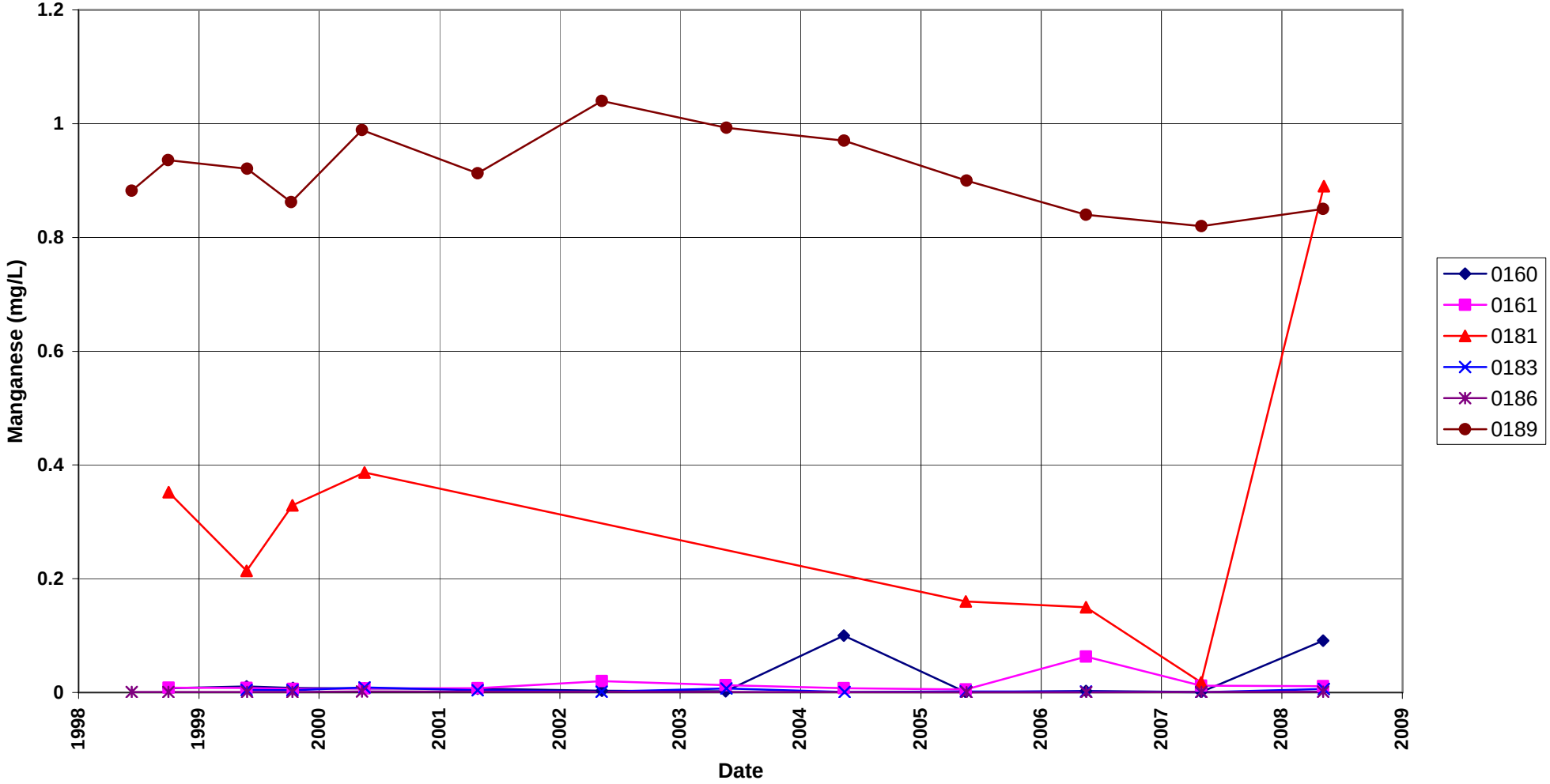
Gunnison Processing Site
Manganese Concentration
Drinking Water Equivalent Level (DWEL) = 1.6 mg/L



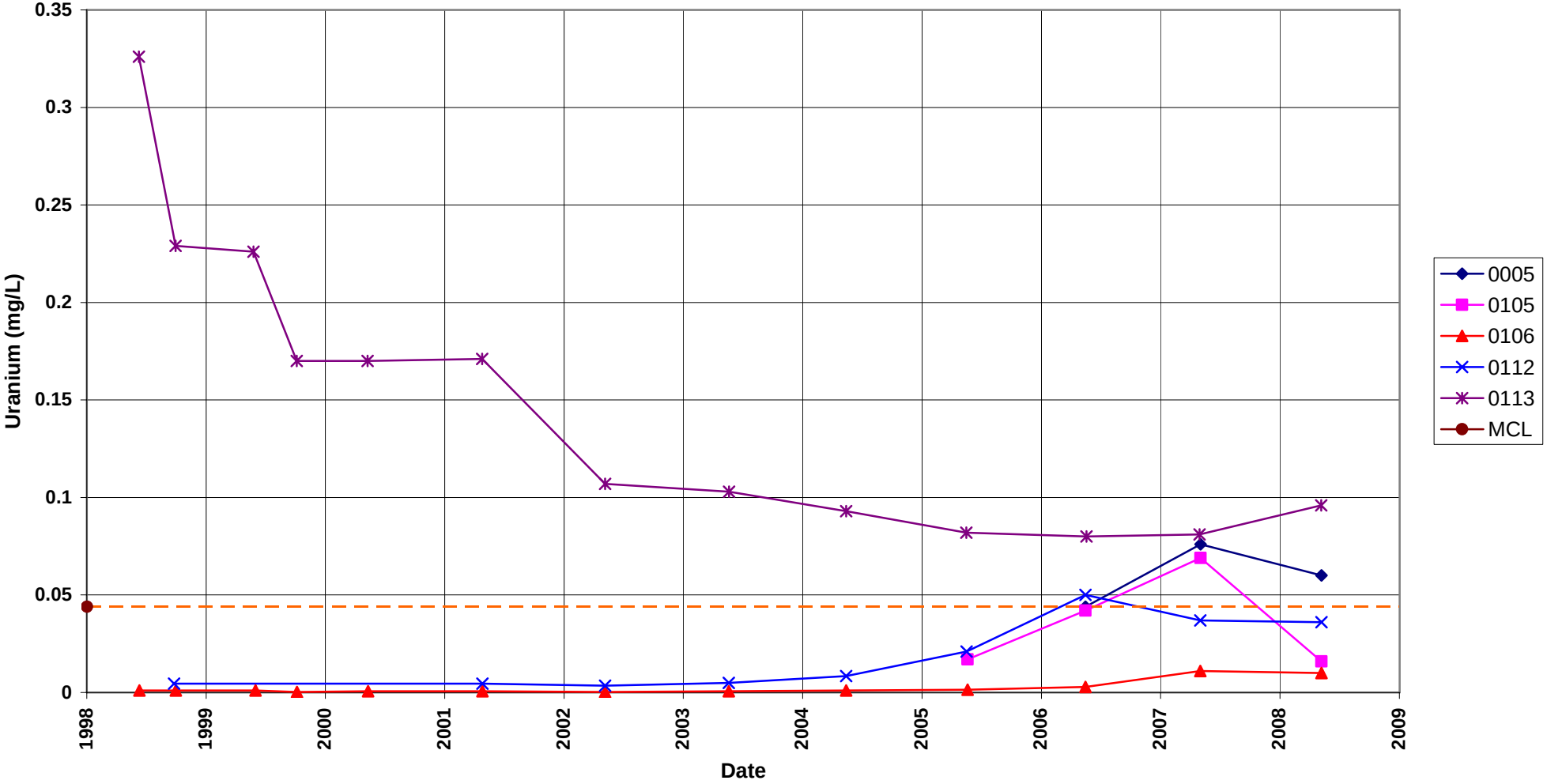
Gunnison Processing Site
Manganese Concentration
Drinking Water Equivalent Level (DWEL) = 1.6 mg/L



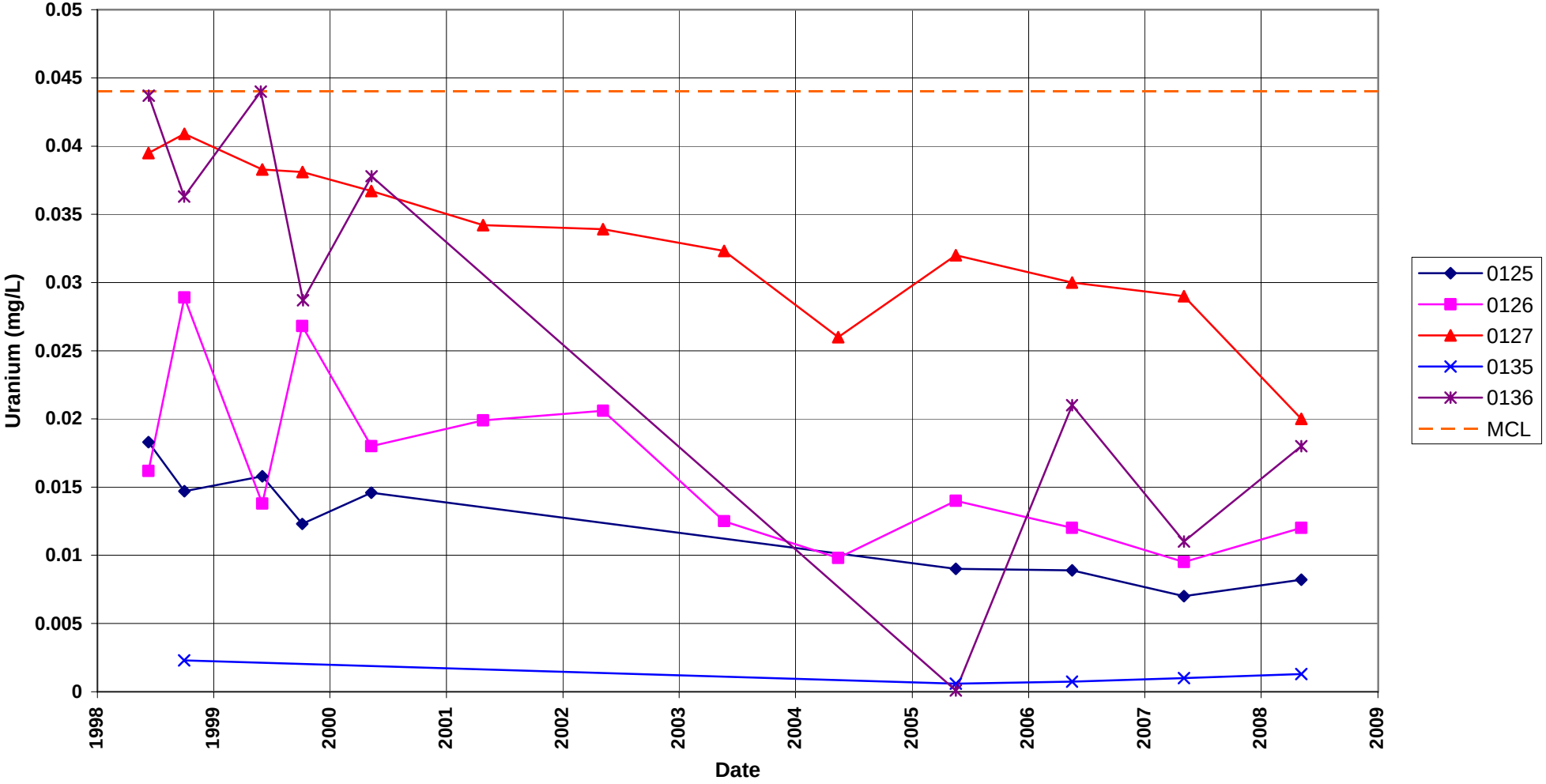
Gunnison Processing Site
Manganese Concentration
Drinking Water Equivalent Level (DWEL) = 1.6 mg/L



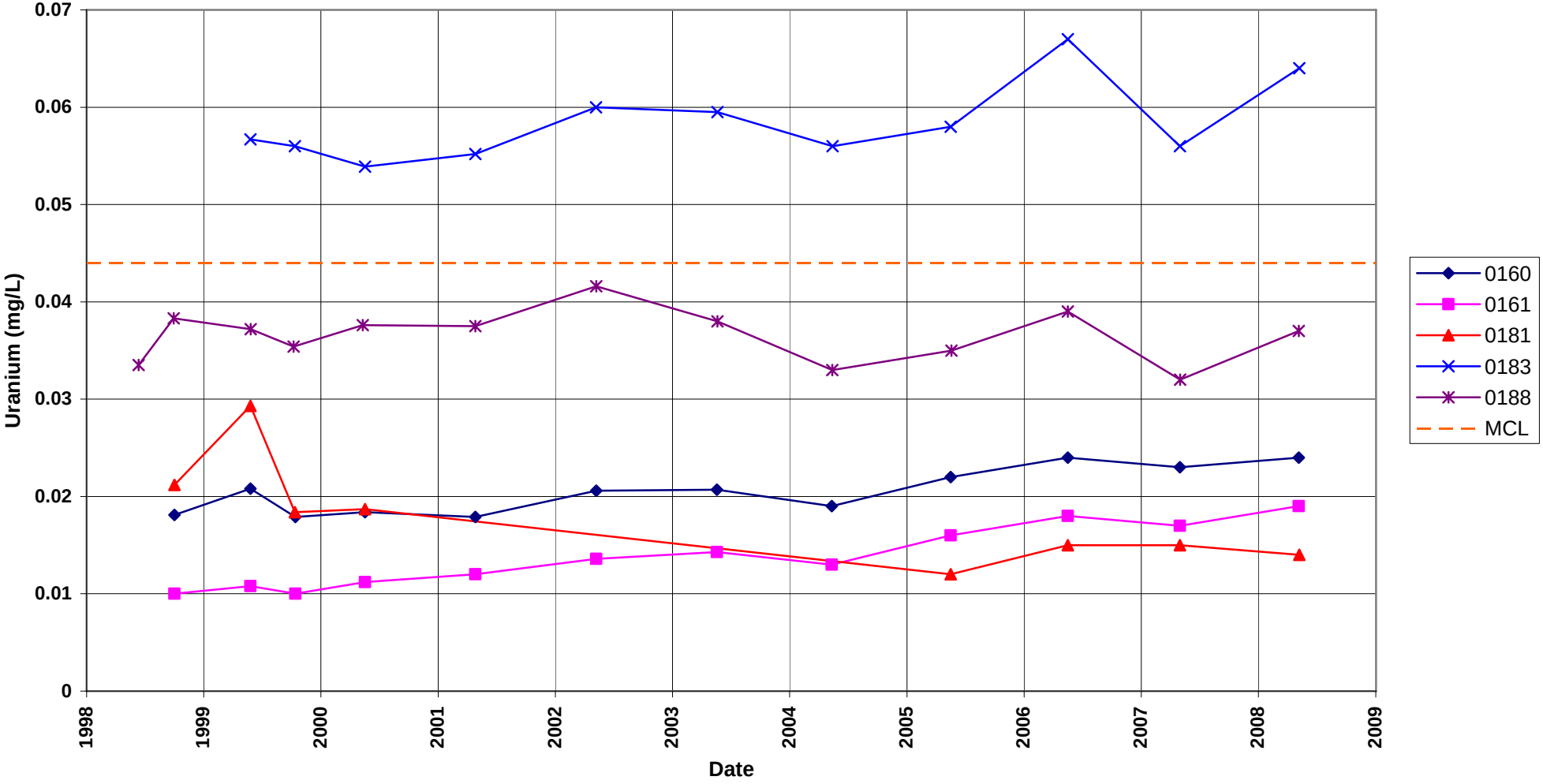
Gunnison Processing Site
Uranium Concentration
Maximum Contaminant Level = 0.044 mg/L



Gunnison Processing Site
Uranium Concentration
Maximum Contaminant Level = 0.044 mg/L



Gunnison Processing Site
Uranium Concentration
Maximum Contaminant Level = 0.044 mg/L



Attachment 3
Sampling and Analysis Work Order

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Stoller
Grand Junction Office

established 1959

Task Order LM-501-02-108
Control Number: 08-0083

March 28, 2008

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

SUBJECT: Contract No. DE-AM01-07LM00060, Stoller
April 2008 Environmental Sampling at Gunnison, Colorado

Reference: FY 2008 LM Task Order No. LM-501-02-108-402

Dear Mr. Desormeau:

The purpose of this letter is to inform you of the upcoming sampling at Gunnison, Colorado. Enclosed are the map and tables specifying sample locations and analytes for monitoring at the Gunnison, Colorado, Processing Site. Water quality data will be collected at this site as part of the routine environmental sampling currently scheduled to begin the week of April 28, 2008.

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

Processing Site (GUN01) Monitor Wells*

002 Al	062 Al	066 Al	106 Al	126 Al	160 Al	186 Al
005 Al	063 Al	067 Al	112 Al	127 Al	161 Al	187 Al
006 Al	064 Al	102 Al	113 Al	135 Al	181 Al	188 Al
012 Al	065 Al	105 Al	125 Al	136 Al	183 Al	189 Al
013 Al						

Processing Site (GUN01) Domestic Wells*

080 Nr	082 Nr	469 Al	477 Nr	478 Nr	667 Al	683 Nr
081 Nr	468 Al	476 Nr				

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

Surface Locations (GUN01)

248	777	780	792	795

Constituent Sampling Breakdown

Gunnison						
Analyte	**Groundwater**		**Surface Water**	**Required Detection Limit (mg/L)**	**Analytical Method**	**Line Item Code**
Approx. No. Samples/yr	29		5			
Field Measurements						
Alkalinity	X		X			
Dissolved Oxygen						
Redox Potential	X		X			
pH	X		X			
Specific Conductance	X		X			
Turbidity	X		X			
Temperature	X		X			
Laboratory Measurements	*GUN01*	*GUN08*				
Aluminum						
Ammonia as N (NH3-N)						
Antimony						
Cadmium						
Calcium		X		5	SW-846 6010	LMM-01
Chloride		X		0.5	SW-846 9056	WCH-A-039
Chromium						
Gross Alpha						
Gross Beta						
Iron		X		0.05	SW-846 6020	LMM-02
Lead						
Lead-210						
Magnesium		X		5	SW-846 6010	LMM-01
Manganese	X	X	X	0.005	SW-846 6010	LMM-01
Molybdenum						
Nickel						
Potassium		X		1	SW-846 6010	LMM-01
Selenium						
Silica						
Sodium		X		1	SW-846 6010	LMM-01
Strontium						
Sulfate		X		0.5	SW-846 9056	MIS-A-044
Sulfide						
Thallium						
Total Dissolved Solids		X		10	SM2540 C	WCH-A-033
Total Organic Carbon						
Uranium	X	X	X	0.0001	SW-846 6020	LMM-02
Vanadium						
Zinc						
Total No. of Analytes	2	10	2			

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

Attachment 4
Trip Report

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Stoller
established 1959
Grand Junction Office

Memorandum

Control Number N/A

DATE: June 16, 2008

TO: Sam Campbell

FROM: Jeff Price/Jeff Walters

SUBJECT: Trip Report

Site: Gunnison, Colorado, Processing Site

Dates of Sampling Event: May 5-7, 2008; June 10, 2008

Team Members: Dan Sellers, Jeff Price, and Jeff Walters.

Number of Locations Sampled: 28 monitor wells, 5 surface water locations, and 8 domestic wells were sampled May 5-7; well 12R was installed and sampled on June 10, 2008.

Locations Not Sampled/Reason: Private well 0468 was not sampled because the homeowner built a wooden deck over the well. Private well 0478 was not sampled because the home is empty and the well is not on. Well 0012 was not sampled because a cobble, which became lodged last year during well reconstruction, is blocking access to the water table.

Location Specific Information: All monitor wells were purged and sampled using Category I criteria; wells 0136 and 0189 are Category II. Well 12R has not been surveyed or had GPS coordinates done yet.

Field Variance: None.

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

False ID	True ID	Sample Type	Ticket Number
2597	0102	Duplicate	NFD-059
2598	0112	Duplicate	NFD-071

Requisition Numbers Assigned: Samples were assigned to requisition identification number (RIN) 08041519. RIN 08051593 was assigned to sample 12R.

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

Well Inspection Summary: All wells in the sampling network were redeveloped the week of April 28-30. Well 12R was developed June 10.

Equipment: All equipment functioned properly.

Regulatory: None.

Institutional Controls

Fences, Gates, Locks: No issues identified.
Signs: Not applicable.
Trespassing/Site Disturbances: None.

Site Issues: None.

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

Access Issues: None.

Corrective Action Required/Taken: None.

(JP/JW/lcg)

cc: Joe Desormeau, DOE (e)
Cheri Bahrke, Stoller (e)
Steve Donivan, Stoller (e)
EDD Delivery (e)

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