Department of Energy
Office of Legacy Management

APR 0 2 2008

Mr. William von Till
Nuclear Regulatory Commission
Uranium Recovery Licensing Branch, Mail Stop T8-F5
Two White Flint North
11545 Rockville Pike
Rockville, Maryland 20852-2738

Subject: Transmittal of Data Validation Package for the Canonsburg, Pennsylvania, Disposal Site, October 2007

Dear Mr. von Till:

Enclosed for your review is the subject document that presents the results of the October 2007 sampling at the U.S Department of Energy's Canonsburg disposal site. Six ground water samples and three surface water samples were collected to demonstrate compliance with standards set forth in the *Ground Water Compliance Action Plan for the Canonsburg, Pennsylvania, UMTRCA Title I Project Site*. Sampling and analysis was conducted as specified in *Ground Water and Surface Water Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites* (DOE 2006). Water levels were measured at each sampled well.

The results from this sampling event indicate that the alternate concentration limit for uranium was not exceeded either in the point-of-compliance wells or the point-of-exposure in Chartiers Creek. Moreover, site-related impacts to water quality in Chartiers Creek were deemed negligible. A detailed evaluation of the sample results is presented in the enclosed data validation package.

Please contact me at (412) 386-4754 if you have any questions.

Sincerely,

Jack Craig
Site Manager

Enclosures (5)

cc /w enclosures:
S. Harper, Pennsylvania Dept. of Environmental Protection
D. Shearer, Pennsylvania Dept. of Environmental Protection

APR 0 2 2008

cc w/o enclosure:
M. Miller, Stoller (e)
File CAN 410.02 (Roberts)

Sampling Events-DVPs\DVP Canonsburg October 2007.doc

DOE–LM/1567–2008

Data Validation Package

October 2007
Groundwater and Surface Water Sampling at Canonsburg, Pennsylvania

January 2008

U.S. Department of Energy
Office of Legacy Management

Work Performed by the S.M. Stoller Corporation Under DOE Contract No. DE–AC01–02GJ79491
for the U.S. Department of Energy Office of Legacy Management.

Contents

End of current text

Sampling Event Summary

Site: Canonsburg, Pennsylvania, Disposal Site

Sampling Period: October 9, 2007

Six groundwater samples and three surface water samples were collected at the Canonsburg, Pennsylvania, Disposal Site to demonstrate compliance with standards as set forth in the *Ground Water Compliance Action Plan for the Canonsburg, Pennsylvania, UMTRA Project Site*. Water levels were measured at each sampled well. Sampling and analysis was conducted as specified in *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites* (2006). One duplicate sample was collected from location 0424.

The U.S. Department of Energy monitors groundwater and surface water at the Canonsburg site to demonstrate that uranium concentrations do not exceed U.S. Nuclear Regulatory Commission-approved alternate concentration limits (ACL) of 1.0 milligram per liter (mg/L) in groundwater and 0.01 mg/L at the point of exposure in Chartiers Creek.

The ACL for uranium was not exceeded in point-of-compliance wells 0412, 0413, and 0414. Although the uranium concentration in well 0412 has been generally increasing since 2002 as illustrated in the time-concentration graphs included with the analytical data, it remains below the ACL.

Comparisons of the analytical results from Chartiers Creek downstream locations 0602 and 0603 to the results from the upstream location 0601 indicate negligible site-related impacts to water quality in Chartiers Creek. The uranium concentration did not exceed the ACL at any of the surface locations.

Review of the data indicates that the alkalinity and sulfate results reported for location 0410 from the analytical laboratory were rejected.

Michele Miller
Site Lead, S.M. Stoller

Date January 30, 2008

Sample Location, Canonsburg, Pennsylvania, Disposal Site

Data Assessment Summary

Water Sampling Field Activities Verification Checklist

Project	Canonsburg, Pennsylvania	**Date(s) of Water Sampling**	October 9, 2007
Date(s) of Verification	December 5, 2007	**Name of Verifier**	

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures?	Yes	
List other documents, SOP's, instructions.		Work Order Letter dated September 12, 2007
2. Were the sampling locations specified in the planning documents sampled?	Yes	
3. Was a pre-trip calibration conducted as specified in the above named documents?	Yes	Pre-trip calibration was performed on October 2, 2007.
4. Was an operational check of the field equipment conducted twice daily?	Yes	Two operational checks were performed on October 9, 2007.
Did the operational checks meet criteria?	Yes	
5. Were the number and types (alkalinity, temperature, Ec, 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?		
If a portable pump was used, was there a 4 hour delay between pump installation and sampling?	NA	

Water Sampling Field Activities Verification Checklist (continued)

	Response (Yes, No, NA)	Comments
8. Were the following conditions met when purging a Category II well:		
Was the flow rate less than 500 mL/min?	Yes	
Was one pump/tubing volume removed prior to sampling?	Yes	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	Yes, a duplicate sample was collected from location 0424.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	NA	An equipment blank was not required because dedicated and/or new tubing was used at each location.
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	The duplicate sample was assigned a location ID of 5424.
Was the true identity of the samples recorded on the Quality Assurance Sample Log?	No	There was no entry on the Quality Assurance Sample Log. The field notes incorrectly indicated that a QC sample was collected from location 0412.
13. Were samples collected in the containers specified?	No	A separate bottle for alkalinity and sulfate was submitted from locations 0410 and 0412. It is suspected that the bottle for location 0410 was a duplicate of 0412, see above.
14. Were samples filtered and preserved as specified?	Yes	The metals bottle from location 0412 was preserved by the laboratory upon receipt.
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?	No	The presence of ice was not documented at locations 0410 and 0414B.
20. Were water levels measured at the locations specified in the planning documents?	Yes	

Laboratory Performance Assessment

General Information

Report Number (RIN): 07101195
Sample Event: October 9, 2007
Site(s): Canonsburg, Pennsylvania
Laboratory: Paragon Analytics, Fort Collins, Colorado
Work Order No.: 0710127
Analysis: Metals, Inorganics, and Radiochemistry
Validator: Steve Donivan
Review Date: December 5, 2007

This validation was performed according to the *Environmental Procedures Catalog* (STO 6), "Standard Practice for Validation of Laboratory Data," GT-9(P) Rev 1 (2006). The procedure was applied at Level 3, Data Validation. See attached Data Validation Worksheets for supporting documentation on the data review and validation. The analysis was successfully completed. The sample was prepared and analyzed using accepted procedures based on methods specified by line item code, which are listed in Table 1.

Table 1. Analytes and Methods

Analyte	Line Item Code	Prep Method	Analytical Method
Alkalinity	WCH-A-002	MCAWW 310.1	MCAWW 310.1
Calcium, Magnesium, Potassium, Sodium	MET-A-020	SW-846 3005A	SW-846 6010B
Chloride, Cl	MIS-A-039	SW-846 9056	SW-846 9056
Gross Alpha/Beta	GPC-A-001	EPA 900.0	EPA 900.0
Manganese, Mn	GJO-17	SW-846 3005A	SW-846 6010B
Molybdenum, Mo	GJO-15	SW-846 3005A	SW-846 6020
Sulfate, SO_4	MIS-A-044	SW-846 9056	SW-846 9056
Uranium, U	GJO-01	SW-846 3005A	SW-846 6020

Sample Shipping/Receiving

Paragon Analytics, Fort Collins, Colorado, received 10 water samples on October 12, 2007, accompanied by a Chain of Custody (COC) form. The COC form was checked to confirm that all of the samples were listed on the form and that signatures and dates were present indicating sample relinquishment and receipt. The sample submittal had no errors or omissions.

Preservation and Holding Times

The sample shipments were received cool and intact with the temperature within the chilled cooler of 5.2 °C, which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses with the exception of the metals bottle from location 0412. This sample was acidified and allowed to equilibrate upon receipt. All samples were analyzed within the applicable holding times.

Data Qualifier Summary

The analytical results were qualified as listed in Table 2.

Table 2. Data Qualifier Summary

Sample Number	Location	Analyte	Flag	Reason
All	All	Potassium	J	Matrix spike failure
All	All	Sodium	J	Serial dilution failure
0710127-1	0406A	Gross Beta	J	Less than 3 times the MDC
0710127-2	0410	Alkalinity	R	Incorrect sample submitted
0710127-2	0410	Gross Alpha	J	Less than 3 times the MDC
0710127-2	0410	Molybdenum	U	Less than 5 times the calibration blank
0710127-2	0410	Sulfate	R	Incorrect sample submitted
0710127-2	0410	Uranium	U	Less than 5 times the calibration blank
0710127-3	0424 Duplicate	Uranium	U	Less than 5 times the calibration blank
0710127-5	0414B	Gross Beta	J	Less than 3 times the MDC

MDC = minimum detectable concentration

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 6010B

Calibrations for calcium, magnesium, molybdenum, potassium, and sodium were performed on October 18, 2007, using one calibration standard and a blank. 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 ten CCVs. All calibration check results met the acceptance criteria. A reporting limit verification check was made at the required frequency to verify the linearity of the calibration curve near the practical quantitation limit. The check results were within the acceptance range.

Method SW-846 6020

Calibrations for molybdenum and uranium were performed October 15, 2007. The initial calibrations were performed using six calibration standards resulting in calibration curves with correlation coefficient (r^2) values greater than 0.995. The absolute values of the curve intercepts were less than 3 times the method detection limits (MDL). Calibration and laboratory spike standards were prepared from independent sources. Initial and CCV checks were made at the

required frequency resulting in four CCVs. All initial and CCV results were within the acceptance range with the exception of CCV1 for molybdenum. There were no samples associated with this CCV. 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 SW-846 9056

Initial calibrations were performed for chloride and sulfate using five calibration standards on October 12, 2007. The resulting calibration curves had r^2 values greater than 0.995 and intercepts less than 3 times the MDL. Initial calibration and calibration check standards were prepared from independent sources. Initial and CCV checks were made at the required frequency resulting in eight CCVs. All initial and CCV results were within the acceptance range.

Radiochemical Analysis

Radiochemical results are qualified with a "J" flag (estimated) when the result is greater than the minimum detectable concentration (MDC), but less than 3 times the MDC. Radiochemical results are qualified with a "U" flag (not detected) when the result is greater than the MDC, but less than the two sigma total propagated uncertainty.

Gross Alpha/Beta

Plateau calibrations were performed on November 6, 2006. Alpha and beta attenuation calibrations were performed on November 26, 2006, covering a range of 0 to 204 milligrams (mg). All standards were counted to a minimum of 10,000 counts. All calibration and background checks met acceptance criteria. The residual mass was less than 100 mg for all samples.

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 initial and continuing calibration blank (CCB) results were below the practical quantitation limits for calcium, magnesium, manganese, molybdenum, potassium, sodium, and uranium with the exception of CCB1 for molybdenum. There were no samples associated with this CCB. 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. The method blank results for chloride and sulfate were below the MDL with the exception of CCB3 for chloride. There were no samples associated with this CCB. The gross alpha and gross beta method blank results were below the MDC.

Inductively Coupled Plasma (ICP) Interference Check Sample 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 all analytes as a measure of method performance in the sample matrix. MS data are not evaluated when the concentration of the unspiked sample is greater than 4 times the spike concentration. The MS/MSD recoveries met the acceptance criteria for all analytes evaluated with the exception of the MSD for potassium. The associated potassium result is qualified with a "J" flag (estimated).

Laboratory Replicate Analysis

The relative percent difference values for the laboratory replicate sample and MSD sample results for all non-radiochemical analytes were less than twenty percent and the relative error ratio for gross alpha and gross beta was less than 3.0, 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 categories.

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 calcium, magnesium, manganese, potassium, and sodium. The acceptance criteria were met for all analytes with the exception of sodium. The associated sodium result is qualified with a "J" flag (estimated).

Detection Limits/Dilutions

Samples were diluted in a consistent and acceptable manner when required. Dilutions were not required to reduce interferences. The required detection limits were met for all analytes with the following exception. The required detection limits were not met for gross alpha and gross beta in some cases because of the elevated levels of dissolved solids in the samples.

Completeness

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

Chromatography Peak Integration

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

Anion/Cation Balance

The anion/cation balance is used to determine if major ion concentrations have been quantified correctly. The total anions should balance with the total cations when expressed in milliequivalents per liter (meq/L). Table 3 shows the total anion and cation results from this event and the charge balance, which is a relative percent difference calculation. Typically, a charge balance difference of 10 percent is considered acceptable.

Table 3. Cation/Anion Balance

Site Code	Location	Cations (meq/L)	Anions (meq/L)	Charge Balance (%)
CAN01	0406A	18.28	17.98	0.8
CAN01	0410	7.77	22.12	48.0
CAN01	0412	39.00	34.05	6.8
CAN01	0413	8.85	8.43	2.4
CAN01	0414B	7.45	7.54	0.6
CAN01	0424	13.46	14.79	4.7
CAN01	0601	10.40	9.86	2.7
CAN01	0602	10.54	10.38	0.8
CAN01	0603	10.68	9.92	3.7

With the exception of location 0410, the charge balance value for all locations was less than 10 percent indicating acceptable data quality. Review of the data for location 0410 indicates that the alkalinity and sulfate data are anomalous. A separate bottle was collected for alkalinity and sulfate from locations 0410 and 0412. The alkalinity and sulfate data reported for these locations are equivalent, with alkalinity values of 690 mg/L and 750 mg/L respectively. However the alkalinity for these locations measured in the field was 34 mg/L and 641 mg/L. It is suspected that the alkalinity and sulfate bottle submitted for location 0410 was actually a duplicate of the sample from location 0412. The alkalinity and sulfate results for location 0410 are qualified with an "R" flag as rejected.

Electronic Data Deliverable (EDD) File

The EDD file arrived on October 29, 2007, and was loaded into the SEEPro database on December 17, 2007. 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: 12/5/2007

EDD File: \\condor\sms\07101195\07101195.txt

EDD Errors: 0

Record	Error Type	Field	Error Description
			NO ERRORS DETECTED

SAMPLE MANAGEMENT SYSTEM

General Data Validation Report

RIN: 07101195 **Lab Code:** PAR **Validator:** _____ **Validation Date:** 12/5/2007

Project: Canonsburg **Analysis Type:** ☐ Metals ☐ General Chem ☐ Rad ☐ Organics

# of Samples: 10 **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	There are 2 detection limit failures.
☐ Field/Trip Blanks	
☑ Field Duplicates	There was 1 duplicate evaluated.

SAMPLE MANAGEMENT SYSTEM

RIN: 07101195 Lab Code: PAR

Non-Compliance Report: Detection Limits

Project: Canonsburg

Validation Date: 12/5/2007

Ticket	Location	Lab Sample ID	Method Code	Lab Method	Analyte Name	Result	Qualifier	Reported Detection Limit	Required Detection Limit	Units
FLX 780	412	0710127-3	GPC-A-001	SOP724R10	GROSS BETA	72.5		8.57	4	pCi/L
FLX 780	412	0710127-3	GPC-A-001	SOP724R10	GROSS ALPHA	269		3.77	2	pCi/L

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 07101195 **Lab Code:** PAR **Date Due:** 10/26/2007

Matrix: Water **Site Code:** CAN01 **Date Completed:** 10/29/2007

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								
Calcium	10/18/2007			OK	OK	OK	OK			106.0	104.0	0.0	101.0	6.0	101.0
Calcium	10/18/2007												102.0		
Calcium	10/18/2007												99.0		
Magnesium	10/18/2007			OK	OK	OK	OK			120.0	120.0	0.0	103.0	4.0	103.0
Magnesium	10/18/2007												105.0		
Magnesium	10/18/2007												103.0		
Manganese	10/18/2007			OK	OK	OK	OK			0.0	0.0	0.0	91.0	4.0	101.0
Manganese	10/18/2007												93.0		
Manganese	10/18/2007												*90.0*		
Molybdenum	10/15/2007	0.0000	1.0000	OK	OK	OK	OK			102.0	102.0	0.0	115.0		99.4
Potassium	10/18/2007			OK	OK	OK	OK			131.0	131.0	0.0			85.0
Sodium	10/18/2007			OK	OK	OK	OK			123.0	123.0	0.0		12.0	87.0
Uranium	10/15/2007	0.0000	1.0000	OK	OK	OK	OK			104.0	104.0	1.0	101.0		111.0

SAMPLE MANAGEMENT SYSTEM

Wet Chemistry Data Validation Worksheet

RIN: 07101195 **Lab Code:** PAR **Date Due:** 10/26/2007

Matrix: Water **Site Code:** CAN01 **Date Completed:** 10/29/2007

Analyte	Date Analyzed	CALIBRATION						Method Blank	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R^2	ICV	CCV	ICB	CCB						
ALKALINITY, Total as CaCO3	10/19/2007			OK	OK	OK	OK	OK	99.0				
Chloride	10/16/2007	0.000	0.9999	OK	OK	OK	OK	OK	98.0	110.0	111.0	0	
Sulfate	10/16/2007	0.000	0.9999	OK	OK	OK	OK	OK	96.0	103.0	103.0	0	

SAMPLE MANAGEMENT SYSTEM
Radiochemistry Data Validation Worksheet

RIN: 07101195 **Lab Code:** PAR **Date Due:** 10/26/2007

Matrix: Water **Site Code:** CAN01 **Date Completed:** 10/29/2007

Sample	Analyte	Date Analyzed	Result	Flag	Tracer %R	LCS %R	MS %R	Duplicate
Method Blank	Gross Alpha	10/24/2007	-0.0319	U				
MS	Gross Alpha	10/24/2007					116	
LCS	Gross Alpha	10/24/2007				109		
LCS	Gross Beta	10/24/2007				102		
Method Blank	Gross Beta	10/24/2007	0.173	U				
MS	Gross Beta	10/24/2007					107	

Sampling Quality Control Assessment

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

Sampling Protocol

All monitor well sample results were qualified with an "F" flag in the database indicating the wells were purged and sampled using the low-flow sampling method. Additionally, sample results for wells 0406A, 0410, 0413, and 0414B were qualified with a "Q" flag indicating the data are qualitative because these wells are Category II based on turbidity and water level drawdown.

Equipment Blank Assessment

An equipment blank was not necessary because new pump-head tubing was used at each location.

Field Duplicate Assessment

Field duplicate samples are collected and analyzed as an indication of overall precision of the measurement process. The precision observed includes both field and laboratory precision and has more variability than laboratory duplicates which measure only laboratory performance. Duplicate samples were collected from location 0424. The non-radiochemical duplicate results met the U.S. Environmental Protection Agency recommended laboratory duplicate criteria of having a relative percent difference of less than 20 percent for results that are greater than 5 times the practical quantitation limit. The gross alpha and gross beta duplicate results had relative error ratios less than three demonstrating acceptable precision.

SAMPLE MANAGEMENT SYSTEM

Validation Report: Field Duplicates

RIN: 07101195 **Lab Code:** PAR **Project:** Canonsburg **Validation Date:** 12/5/2007

Duplicate: 5424 **Sample:** 424

Analyte	Sample Result	Sample Flag	Sample Error	Duplicate Result	Duplicate Flag	Duplicate Error	RPD	RER	Units
BICARBONATE AS CaCO3	410			400			2.47		MG/L
CALCIUM	110000			110000			0		UG/L
CARBONATE AS CaCO3	50	U		50	U				MG/L
CHLORIDE	160			160			0		MG/L
GROSS ALPHA	1.7	U	1.19	0.32	U	1.01		1.7	pCi/L
GROSS BETA	2.42	U	1.69	2.22	U	1.91		0.2	pCi/L
MAGNESIUM	32000			31000			3.17		UG/L
MANGANESE	6000			5800			3.39		UG/L
MOLYBDENUM	0.39	B		0.44	B				UG/L
POTASSIUM	4700			4700			0		UG/L
SODIUM	120000			120000			0		UG/L
SULFATE	89			89			0		MG/L
TOTAL ALKALINITY AS CaCO3	410			400			2.47		MG/L
URANIUM	0.074	B		0.037	B		66.67		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: 1-3-2008

Data Validation Lead: Steve Donivan — Date: 1-3-2008

Attachment 1
Assessment of Anomalous Data

Potential Outliers Report

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 Studentized Range 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 alkalinity and sulfate data for location 0410 were identified as potential outliers. These data were rejected because of a sample bottle misidentification. The data for this RIN are acceptable as qualified.

Data Validation Outliers Report - No Field Parameters
Laboratory: PARAGON (Fort Collins, CO)
RIN: 07101195
Comparison: All Historical Data
Report Date: 12/26/2007

Site Code	Location Code	Sample Date	Analyte	Current Result	Current Qualifiers Lab	Current Qualifiers Data	Historical Maximum Result	Historical Maximum Qualifiers Lab	Historical Maximum Qualifiers Data	Historical Minimum Result	Historical Minimum Qualifiers Lab	Historical Minimum Qualifiers Data	Count N	Count N Below Detect	Normally Distributed	Statistical Outlier
CAN01	0406A	10/09/2007	Calcium	250			230		FQ	194		F	5	0	Yes	No
CAN01	0406A	10/09/2007	Potassium	6.3			5.5		FQ	3.73		F	5	0	Yes	No
CAN01	0406A	10/09/2007	Uranium	0.0021			0.0019		F	0.00029		FQ	5	0	Yes	No
CAN01	0410	10/09/2007	Alkalinity, Total (As CaCO3)	690			120		F	10		FQ	31	0	Yes	Yes
CAN01	0410	10/09/2007	Chloride	22			182		L	36		F	30	0	Yes	No
CAN01	0410	10/09/2007	Magnesium	25			20.4		L	11.4		FQ	30	0	Yes	No
CAN01	0410	10/09/2007	Molybdenum	0.0001	B		0.2		F	0.00017	U	FQ	30	28	Yes	No
CAN01	0410	10/09/2007	Sodium	74			65.1		F	32.1		F	30	0	No	Yes
CAN01	0410	10/09/2007	Sulfate	1000			171			72		FQ	30	0	Yes	Yes
CAN01	0410	10/09/2007	Uranium	0.000019	B		0.003	U	F	0.000033	B	UFQ	31	28	Yes	No
CAN01	0412	10/09/2007	Calcium	590			561		F	166			36	0	Yes	No
CAN01	0412	10/09/2007	Gross Alpha	269			212		F	12			17	0	Yes	No
CAN01	0412	10/09/2007	Manganese	29			26.9		F	4.05			36	0	No	No
CAN01	0412	10/09/2007	Uranium	0.36			0.259		F	0.0176			36	0	Yes	No
CAN01	0424	10/09/2007	Chloride	160			150			91		F	18	0	Yes	No
CAN01	0424	10/09/2007	Gross Beta	3.06	U		4.4			3.1			5	1	Yes	No
CAN01	0424	10/09/2007	Gross Beta	2.67	U		4.4			3.1			5	1	Yes	No
CAN01	0424	10/09/2007	Magnesium	32			31		F	23.5		L	18	0	Yes	No
CAN01	0424	10/09/2007	Sulfate	89			230			120		F	18	0	Yes	No
CAN01	0424	10/09/2007	Uranium	0.000037	B		0.001	U		0.000048	B	UF	20	20	No	No

Data Validation Outliers Report - No Field Parameters
Laboratory: PARAGON (Fort Collins, CO)
RIN: 07101195
Comparison: All Historical Data
Report Date: 12/26/2007

Site Code	Location Code	Sample Date	Analyte	Current Result	Current Qualifiers Lab	Current Qualifiers Data	Historical Maximum Result	Historical Maximum Qualifiers Lab	Historical Maximum Qualifiers Data	Historical Minimum Result	Historical Minimum Qualifiers Lab	Historical Minimum Qualifiers Data	Count N	Count N Below Detect	Normally Distributed	Statistical Outlier
CAN01	0601	10/09/2007	Manganese	0.033			0.2		RX	0.0569			23	0	No	No
CAN01	0601	10/09/2007	Potassium	14			10.4		RX	3.2		RX	22	0	No	No
CAN01	0602	10/09/2007	Potassium	14			10.2		RX	3.3		RX	25	0	No	Yes
CAN01	0603	10/09/2007	Manganese	0.036			0.13			0.051			19	0	Yes	No
CAN01	0603	10/09/2007	Potassium	14			9.6			3.68			18	0	Yes	No

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 using the Studentized Range 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

Groundwater Quality Data

Groundwater Quality Data by Location (USEE100) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 12/26/2007
Location: 0406A WELL Replacement well for 0406.

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Bicarbonate (As CaCO3)	mg/L	10/09/2007	0001	5	-	15	720		FQ	#	50	
Alkalinity, Carbonate (As CaCO3)	mg/L	10/09/2007	0001	5	-	15	50	U	FQ	#	50	
Alkalinity, Total (As CaCO3)	mg/L	10/09/2007	0001	5	-	15	720		FQ	#	50	
Alkalinity, Total (As CaCO3)	mg/L	10/09/2007	0001	5	-	15	770		FQ	#		
Calcium	mg/L	10/09/2007	0001	5	-	15	250		FQ	#	.013	
Chloride	mg/L	10/09/2007	0001	5	-	15	110		FQ	#	4	
Gross Alpha	pCi/L	10/09/2007	0001	5	-	15	1.63	U	FQ	#	1.63	1.05
Gross Beta	pCi/L	10/09/2007	0001	5	-	15	4.15		FQJ	#	2.93	1.95
Magnesium	mg/L	10/09/2007	0001	5	-	15	48		FQ	#	.0088	
Manganese	mg/L	10/09/2007	0001	5	-	15	2.5		FQ	#	.00016	
Molybdenum	mg/L	10/09/2007	0001	5	-	15	0.0026		FQ	#	.000096	
Oxidation Reduction Potential	mV	10/09/2007	N001	5	-	15	-55.4		FQ	#		
pH	s.u.	10/09/2007	N001	5	-	15	6.73		FQ	#		
Potassium	mg/L	10/09/2007	0001	5	-	15	6.3		FQJ	#	.043	
Sodium	mg/L	10/09/2007	0001	5	-	15	39		FQJ	#	.0044	
Specific Conductance	umhos /cm	10/09/2007	N001	5	-	15	1443		FQ	#		
Sulfate	mg/L	10/09/2007	0001	5	-	15	23		FQ	#	2.5	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 12/26/2007
Location: 0406A WELL Replacement well for 0406.

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Temperature	C	10/09/2007	N001	5	-	15	19.73		FQ	#		
Turbidity	NTU	10/09/2007	0001	5	-	15	9.8		FQ	#		
Uranium	mg/L	10/09/2007	0001	5	-	15	0.0021		FQ	#	.0000059	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 12/26/2007
Location: 0410 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	10/09/2007	0001	11.48	-	16.08	34		FQ	#		
Calcium	mg/L	10/09/2007	0001	11.48	-	16.08	49		FQ	#	.013	
Chloride	mg/L	10/09/2007	0001	11.48	-	16.08	22		FQ	#	4	
Gross Alpha	pCi/L	10/09/2007	0001	11.48	-	16.08	1.64		FQJ	#	1.1	.791
Gross Beta	pCi/L	10/09/2007	0001	11.48	-	16.08	1.81	U	FQ	#	1.81	1.15
Magnesium	mg/L	10/09/2007	0001	11.48	-	16.08	25		FQ	#	.0088	
Manganese	mg/L	10/09/2007	0001	11.48	-	16.08	2.7		FQ	#	.00016	
Molybdenum	mg/L	10/09/2007	0001	11.48	-	16.08	0.0001	B	UFQ	#	.000096	
Oxidation Reduction Potential	mV	10/09/2007	N001	11.48	-	16.08	101.5		FQ	#		
pH	s.u.	10/09/2007	N001	11.48	-	16.08	5.4		FQ	#		
Potassium	mg/L	10/09/2007	0001	11.48	-	16.08	2		FQJ	#	.043	
Sodium	mg/L	10/09/2007	0001	11.48	-	16.08	74		FQJ	#	.0044	
Specific Conductance	umhos /cm	10/09/2007	N001	11.48	-	16.08	863		FQ	#		
Temperature	C	10/09/2007	N001	11.48	-	16.08	17.81		FQ	#		
Turbidity	NTU	10/09/2007	N001	11.48	-	16.08	25.4		FQ	#		
Uranium	mg/L	10/09/2007	0001	11.48	-	16.08	0.000019	B	UFQ	#	.0000059	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 12/26/2007
Location: 0412 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Bicarbonate (As CaCO3)	mg/L	10/09/2007	0001	13.21	-	18.21	750		F	#	50	
Alkalinity, Carbonate (As CaCO3)	mg/L	10/09/2007	0001	13.21	-	18.21	50	U	F	#	50	
Alkalinity, Total (As CaCO3)	mg/L	10/09/2007	0001	13.21	-	18.21	641		F	#		
Alkalinity, Total (As CaCO3)	mg/L	10/09/2007	0001	13.21	-	18.21	750		F	#	50	
Calcium	mg/L	10/09/2007	0001	13.21	-	18.21	590		F	#	.064	
Chloride	mg/L	10/09/2007	0001	13.21	-	18.21	22		F	#	4	
Gross Alpha	pCi/L	10/09/2007	0001	13.21	-	18.21	269		F	#	3.77	44.2
Gross Beta	pCi/L	10/09/2007	0001	13.21	-	18.21	72.5		F	#	8.57	13.1
Magnesium	mg/L	10/09/2007	0001	13.21	-	18.21	90		F	#	.0088	
Manganese	mg/L	10/09/2007	0001	13.21	-	18.21	29		F	#	.00082	
Molybdenum	mg/L	10/09/2007	0001	13.21	-	18.21	0.00048	B	UF	#	.000096	
Oxidation Reduction Potential	mV	10/09/2007	N001	13.21	-	18.21	-76		F	#		
pH	s.u.	10/09/2007	N001	13.21	-	18.21	6.3		F	#		
Potassium	mg/L	10/09/2007	0001	13.21	-	18.21	6.3		FJ	#	.043	
Sodium	mg/L	10/09/2007	0001	13.21	-	18.21	46		FJ	#	.0044	
Specific Conductance	umhos /cm	10/09/2007	N001	13.21	-	18.21	2173		F	#		
Sulfate	mg/L	10/09/2007	0001	13.21	-	18.21	990		F	#	10	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 12/26/2007
Location: 0412 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Temperature	C	10/09/2007	N001	13.21	-	18.21	17.55		F	#		
Turbidity	NTU	10/09/2007	N001	13.21	-	18.21	9.8		F	#		
Uranium	mg/L	10/09/2007	0001	13.21	-	18.21	0.36		F	#	.00003	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 12/26/2007
Location: 0413 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Bicarbonate (As CaCO3)	mg/L	10/09/2007	0001	6.05	-	11.05	320		FQ	#	50	
Alkalinity, Carbonate (As CaCO3)	mg/L	10/09/2007	0001	6.05	-	11.05	50	U	FQ	#	50	
Alkalinity, Total (As CaCO3)	mg/L	10/09/2007	0001	6.05	-	11.05	320		FQ	#	50	
Alkalinity, Total (As CaCO3)	mg/L	10/09/2007	0001	6.05	-	11.05	323		FQ	#		
Calcium	mg/L	10/09/2007	0001	6.05	-	11.05	120		FQ	#	.013	
Chloride	mg/L	10/09/2007	0001	6.05	-	11.05	24		FQ	#	1	
Gross Alpha	pCi/L	10/09/2007	0001	6.05	-	11.05	28.9		FQ	#	1.06	4.92
Gross Beta	pCi/L	10/09/2007	0001	6.05	-	11.05	14.4		FQ	#	1.68	2.61
Magnesium	mg/L	10/09/2007	0001	6.05	-	11.05	17		FQ	#	.0088	
Manganese	mg/L	10/09/2007	0001	6.05	-	11.05	2.3		FQ	#	.00016	
Molybdenum	mg/L	10/09/2007	0001	6.05	-	11.05	0.0021		FQ	#	.000096	
Oxidation Reduction Potential	mV	10/09/2007	N001	6.05	-	11.05	-95.8		FQ	#		
pH	s.u.	10/09/2007	N001	6.05	-	11.05	6.84		FQ	#		
Potassium	mg/L	10/09/2007	0001	6.05	-	11.05	4.4		FQJ	#	.043	
Sodium	mg/L	10/09/2007	0001	6.05	-	11.05	31		FQJ	#	.0044	
Specific Conductance	umhos /cm	10/09/2007	N001	6.05	-	11.05	756		FQ	#		
Sulfate	mg/L	10/09/2007	0001	6.05	-	11.05	62		FQ	#	2.5	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 12/26/2007
Location: 0413 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Temperature	C	10/09/2007	N001	6.05	-	11.05	17.5		FQ	#		
Turbidity	NTU	10/09/2007	N001	6.05	-	11.05	9.27		FQ	#		
Uranium	mg/L	10/09/2007	0001	6.05	-	11.05	0.061		FQ	#	.0000059	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 12/26/2007
Location: 0414B WELL Replacement well for 0414A.

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Bicarbonate (As CaCO3)	mg/L	10/09/2007	0001	-	220		FQ	#	20	
Alkalinity, Carbonate (As CaCO3)	mg/L	10/09/2007	0001	-	20	U	FQ	#	20	
Alkalinity, Total (As CaCO3)	mg/L	10/09/2007	0001	-	218		FQ	#		
Alkalinity, Total (As CaCO3)	mg/L	10/09/2007	0001	-	220		FQ	#	20	
Calcium	mg/L	10/09/2007	0001	-	110		FQ	#	.013	
Chloride	mg/L	10/09/2007	0001	-	24		FQ	#	1	
Gross Alpha	pCi/L	10/09/2007	0001	-	2.81		FQ	#	.859	.813
Gross Beta	pCi/L	10/09/2007	0001	-	1.84		FQJ	#	1.47	.956
Magnesium	mg/L	10/09/2007	0001	-	18		FQ	#	.0088	
Manganese	mg/L	10/09/2007	0001	-	9.3		FQ	#	.00016	
Molybdenum	mg/L	10/09/2007	0001	-	0.0015		FQ	#	.000096	
Oxidation Reduction Potential	mV	10/09/2007	N001	-	-7.6		FQ	#		
pH	s.u.	10/09/2007	N001	-	6.45		FQ	#		
Potassium	mg/L	10/09/2007	0001	-	2	N	FQJ	#	.043	
Sodium	mg/L	10/09/2007	0001	-	9.8	EN	FQJ	#	.0044	
Specific Conductance	umhos /cm	10/09/2007	N001	-	597		FQ	#		
Sulfate	mg/L	10/09/2007	0001	-	120		FQ	#	2.5	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 12/26/2007
Location: 0414B WELL Replacement well for 0414A.

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Temperature	C	10/09/2007	N001	-	15.92		FQ	#		
Turbidity	NTU	10/09/2007	N001	-	54.6		FQ	#		
Uranium	mg/L	10/09/2007	0001	-	0.004		FQ	#	.0000059	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 12/26/2007
Location: 0424 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Bicarbonate (As CaCO3)	mg/L	10/09/2007	0001	7.58 - 12.58	410		F	#	50	
Alkalinity, Bicarbonate (As CaCO3)	mg/L	10/09/2007	0002	7.58 - 12.58	400		F	#	50	
Alkalinity, Carbonate (As CaCO3)	mg/L	10/09/2007	0001	7.58 - 12.58	50	U	F	#	50	
Alkalinity, Carbonate (As CaCO3)	mg/L	10/09/2007	0002	7.58 - 12.58	50	U	F	#	50	
Alkalinity, Total (As CaCO3)	mg/L	10/09/2007	0001	7.58 - 12.58	410		F	#	50	
Alkalinity, Total (As CaCO3)	mg/L	10/09/2007	0001	7.58 - 12.58	421		F	#		
Alkalinity, Total (As CaCO3)	mg/L	10/09/2007	0002	7.58 - 12.58	400		F	#	50	
Calcium	mg/L	10/09/2007	0001	7.58 - 12.58	110		F	#	.013	
Calcium	mg/L	10/09/2007	0002	7.58 - 12.58	110		F	#	.013	
Chloride	mg/L	10/09/2007	0001	7.58 - 12.58	160		F	#	2	
Chloride	mg/L	10/09/2007	0002	7.58 - 12.58	160		F	#	2	
Gross Alpha	pCi/L	10/09/2007	0001	7.58 - 12.58	1.82	U	F	#	1.82	1.19
Gross Alpha	pCi/L	10/09/2007	0002	7.58 - 12.58	1.71	U	F	#	1.71	1.01
Gross Beta	pCi/L	10/09/2007	0001	7.58 - 12.58	2.67	U	F	#	2.67	1.69
Gross Beta	pCi/L	10/09/2007	0002	7.58 - 12.58	3.06	U	F	#	3.06	1.91
Magnesium	mg/L	10/09/2007	0001	7.58 - 12.58	32		F	#	.0088	
Magnesium	mg/L	10/09/2007	0002	7.58 - 12.58	31		F	#	.0088	
Manganese	mg/L	10/09/2007	0001	7.58 - 12.58	6		F	#	.00016	
Manganese	mg/L	10/09/2007	0002	7.58 - 12.58	5.8		F	#	.00016	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 12/26/2007
Location: 0424 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Molybdenum	mg/L	10/09/2007	0001	7.58	-	12.58	0.00039	B	F	#	.000096	
Molybdenum	mg/L	10/09/2007	0002	7.58	-	12.58	0.00044	B	F	#	.000096	
Oxidation Reduction Potential	mV	10/09/2007	N001	7.58	-	12.58	-51.6		F	#		
pH	s.u.	10/09/2007	N001	7.58	-	12.58	6.55		F	#		
Potassium	mg/L	10/09/2007	0001	7.58	-	12.58	4.7		FJ	#	.043	
Potassium	mg/L	10/09/2007	0002	7.58	-	12.58	4.7		FJ	#	.043	
Sodium	mg/L	10/09/2007	0001	7.58	-	12.58	120		FJ	#	.0044	
Sodium	mg/L	10/09/2007	0002	7.58	-	12.58	120		FJ	#	.0044	
Specific Conductance	umhos /cm	10/09/2007	N001	7.58	-	12.58	1298		F	#		
Sulfate	mg/L	10/09/2007	0001	7.58	-	12.58	89		F	#	5	
Sulfate	mg/L	10/09/2007	0002	7.58	-	12.58	89		F	#	5	
Temperature	C	10/09/2007	N001	7.58	-	12.58	18.11		F	#		
Turbidity	NTU	10/09/2007	N001	7.58	-	12.58	9.78		F	#		
Uranium	mg/L	10/09/2007	0001	7.58	-	12.58	0.000074	B	F	#	.0000059	
Uranium	mg/L	10/09/2007	0002	7.58	-	12.58	0.000037	B	F	#	.0000059	

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.

Surface Water Quality Data

Surface Water Quality Data by Location (USEE102) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 12/26/2007
Location: 0601 SURFACE LOCATION RESERVED MGILBERT, WQD, 4/24/89

Parameter	Units	Sample Date	ID	Result	Qualifiers Lab	Data	QA	Detection Limit	Uncertainty
Alkalinity, Bicarbonate (As CaCO3)	mg/L	10/09/2007	0001	110			#	10	
Alkalinity, Carbonate (As CaCO3)	mg/L	10/09/2007	0001	10	U		#	10	
Alkalinity, Total (As CaCO3)	mg/L	10/09/2007	0001	110			#	10	
Alkalinity, Total (As CaCO3)	mg/L	10/09/2007	0001	112			#		
Calcium	mg/L	10/09/2007	0001	81			#	.013	
Chloride	mg/L	10/09/2007	0001	130			#	2	
Magnesium	mg/L	10/09/2007	0001	20			#	.0088	
Manganese	mg/L	10/09/2007	0001	0.033			#	.00016	
Molybdenum	mg/L	10/09/2007	0001	0.09			#	.000096	
Oxidation Reduction Potential	mV	10/09/2007	N001	40.2			#		
pH	s.u.	10/09/2007	N001	8.12			#		
Potassium	mg/L	10/09/2007	0001	14		J	#	.043	
Sodium	mg/L	10/09/2007	0001	100		J	#	.0044	
Specific Conductance	umhos/cm	10/09/2007	N001	963			#		
Sulfate	mg/L	10/09/2007	0001	190			#	5	
Temperature	C	10/09/2007	N001	22.17			#		
Uranium	mg/L	10/09/2007	0001	0.00023			#	.0000059	

Surface Water Quality Data by Location (USEE102) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 12/26/2007
Location: 0602 SURFACE LOCATION RESERVED MGILBERT, WQD, 4/24/89

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Bicarbonate (As CaCO3)	mg/L	10/09/2007	0001	110			#	10	
Alkalinity, Carbonate (As CaCO3)	mg/L	10/09/2007	0001	10	U		#	10	
Alkalinity, Total (As CaCO3)	mg/L	10/09/2007	0001	110			#	10	
Alkalinity, Total (As CaCO3)	mg/L	10/09/2007	0001	138			#		
Calcium	mg/L	10/09/2007	0001	84			#	.013	
Chloride	mg/L	10/09/2007	0001	130			#	2	
Magnesium	mg/L	10/09/2007	0001	20			#	.0088	
Manganese	mg/L	10/09/2007	0001	0.044			#	.00016	
Molybdenum	mg/L	10/09/2007	0001	0.087			#	.000096	
Oxidation Reduction Potential	mV	10/09/2007	N001	11			#		
pH	s.u.	10/09/2007	N001	8.02			#		
Potassium	mg/L	10/09/2007	0001	14		J	#	.043	
Sodium	mg/L	10/09/2007	0001	100		J	#	.0044	
Specific Conductance	umhos/cm	10/09/2007	N001	527			#		
Sulfate	mg/L	10/09/2007	0001	190			#	5	
Temperature	C	10/09/2007	N001	22.01			#		
Uranium	mg/L	10/09/2007	0001	0.00024			#	.0000059	

Surface Water Quality Data by Location (USEE102) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 12/26/2007
Location: 0603 SURFACE LOCATION WS CHARTIERS CREEK UDR CONRAIL OVPS

Parameter	Units	Sample Date	ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Bicarbonate (As CaCO3)	mg/L	10/09/2007	0001	110			#	10	
Alkalinity, Carbonate (As CaCO3)	mg/L	10/09/2007	0001	10	U		#	10	
Alkalinity, Total (As CaCO3)	mg/L	10/09/2007	0001	110			#	10	
Alkalinity, Total (As CaCO3)	mg/L	10/09/2007	0001	115			#		
Calcium	mg/L	10/09/2007	0001	85			#	.013	
Chloride	mg/L	10/09/2007	0001	130			#	2	
Magnesium	mg/L	10/09/2007	0001	21			#	.0088	
Manganese	mg/L	10/09/2007	0001	0.036			#	.00016	
Molybdenum	mg/L	10/09/2007	0001	0.087			#	.000096	
Oxidation Reduction Potential	mV	10/09/2007	N001	94.4			#		
pH	s.u.	10/09/2007	N001	8.16			#		
Potassium	mg/L	10/09/2007	0001	14		J	#	.043	
Sodium	mg/L	10/09/2007	0001	100		J	#	.0044	
Specific Conductance	umhos/cm	10/09/2007	N001	971			#		
Sulfate	mg/L	10/09/2007	0001	190			#	5	
Temperature	C	10/09/2007	N001	21.98			#		
Uranium	mg/L	10/09/2007	0001	0.00027			#	.0000059	

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

STATIC WATER LEVELS (USEE700) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 12/26/2007

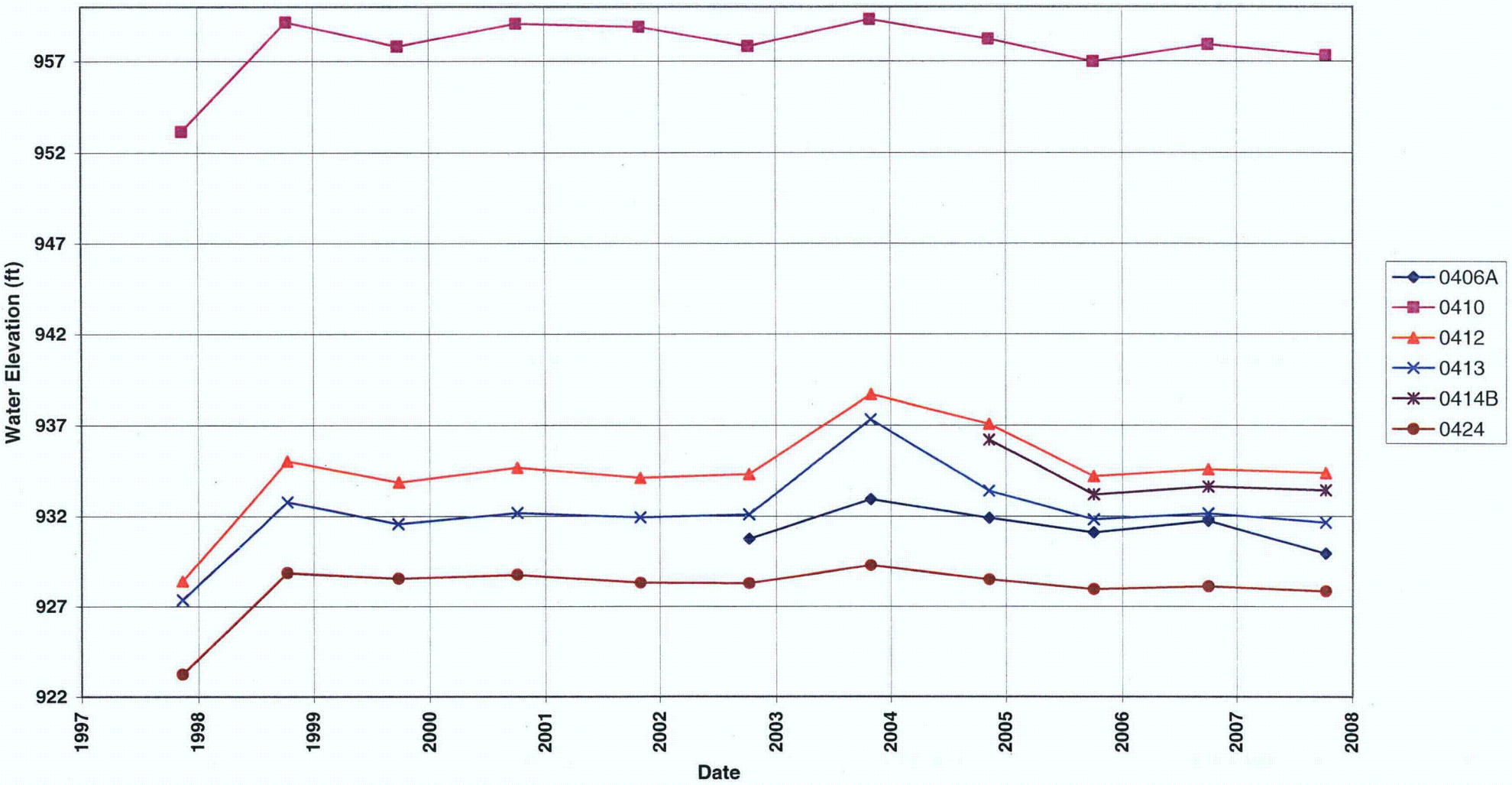
Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0406A		941.26	10/09/2007		11.31	929.95	
0410	U	969.16	10/09/2007		11.82	957.34	
0412	O	949.7	10/09/2007		15.32	934.38	
0413	O	940.36	10/09/2007		8.7	931.66	
0414B		943.65	10/09/2007		10.22	933.43	
0424	C	942.25	10/09/2007		14.4	927.85	

FLOW CODES: B BACKGROUND C CROSS GRADIENT D DOWN GRADIENT O ON SITE
U UPGRADIENT

WATER LEVEL FLAGS: D Dry

Hydrograph

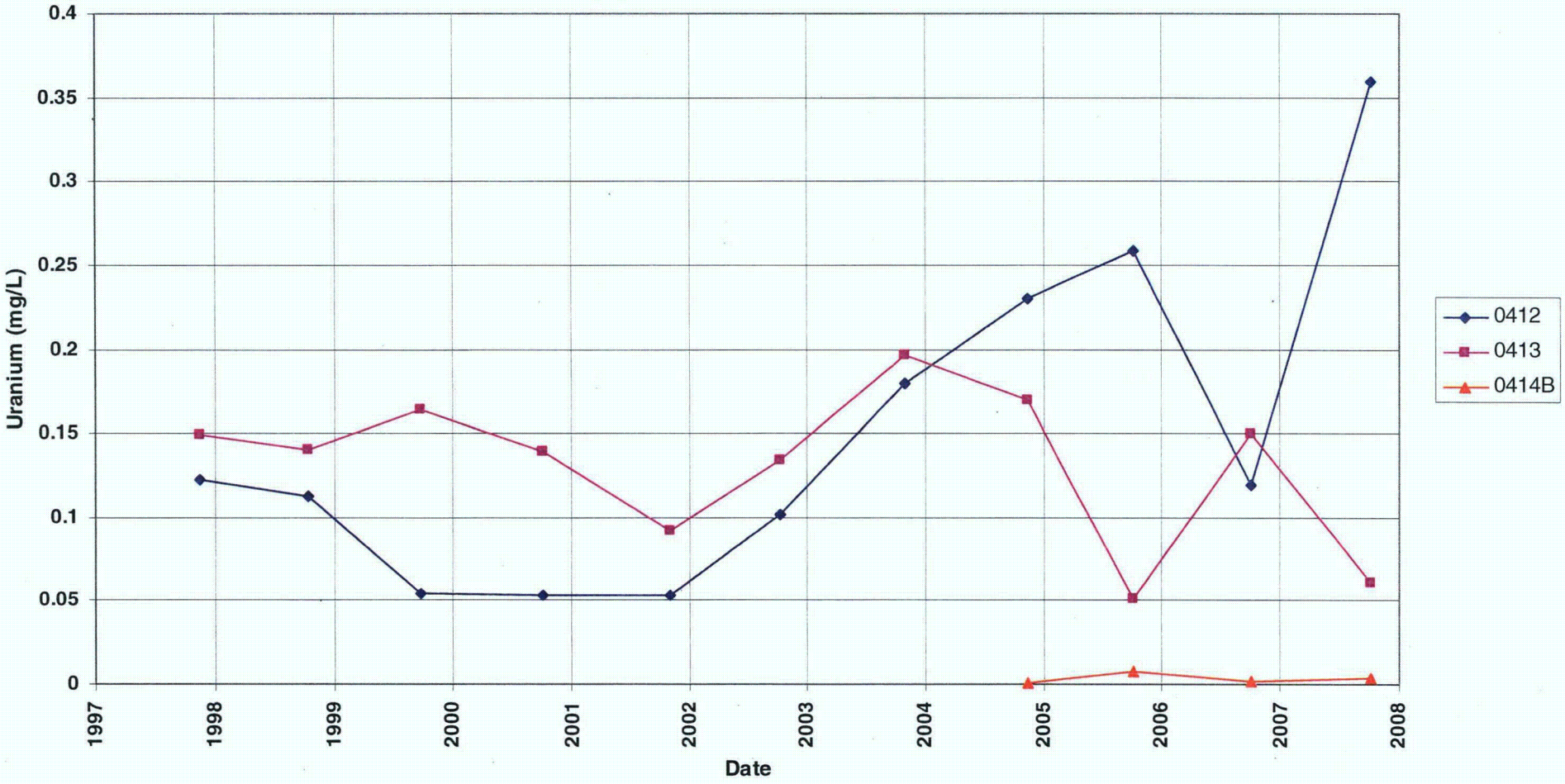
Canonsburg Disposal Site
Hydrograph



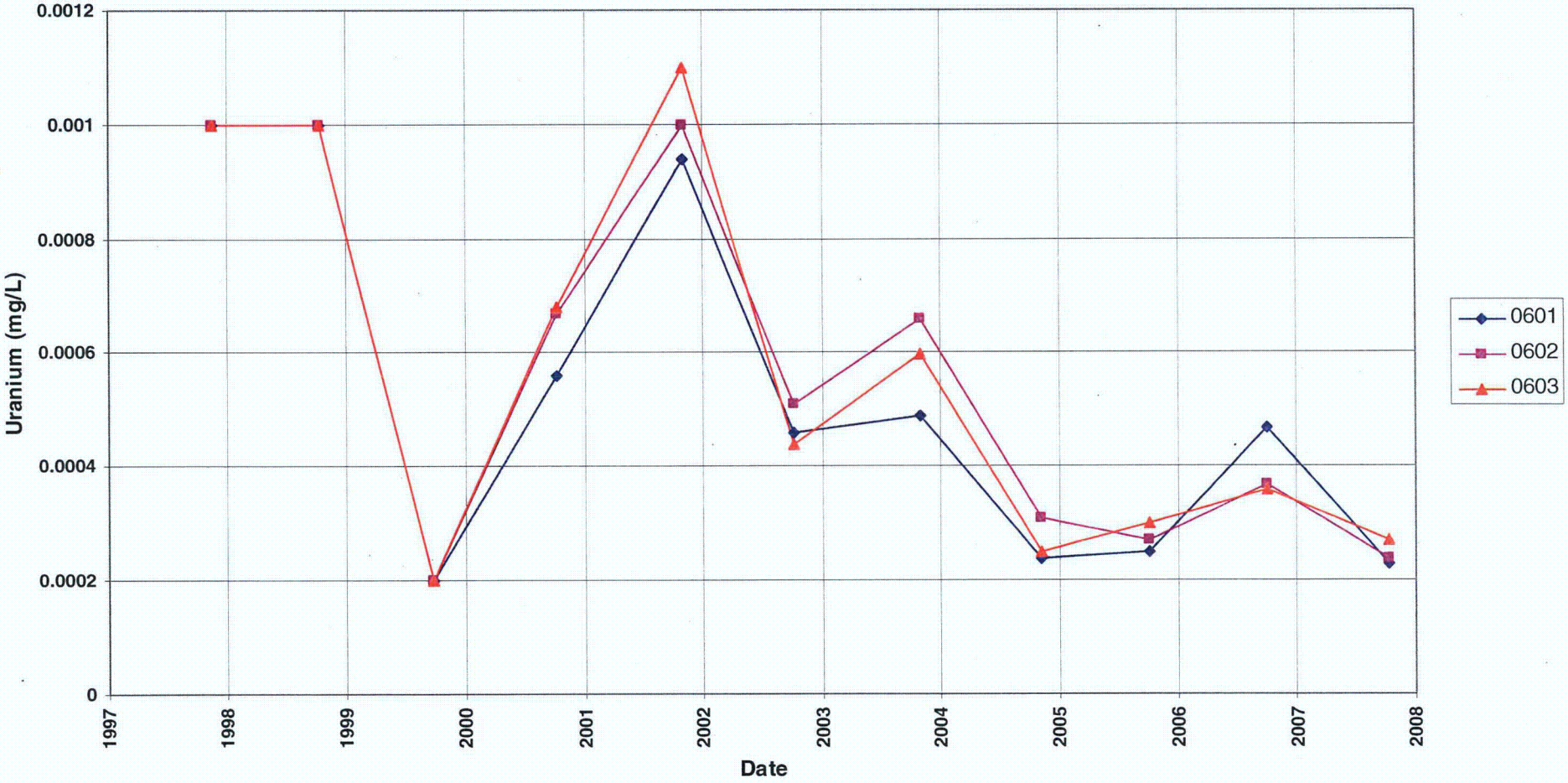
Time Versus Concentration Graphs

Canonsburg Disposal Site Point of Compliance Wells
Uranium Concentration

Alternate Concentration Limit = 1.0 mg/L



Canonsburg Disposal Site surface Locations
Uranium Concentration
Alternate Concentration Limit = 0.01 mg/L



Attachment 3
Sampling and Analysis Work Order

Stoller

established 1959

Task Order ST07-101
Control Number 1000-T07-1408

September 12, 2007

Mr. Jack R. Craig
Program Manager, LM-20
U.S. Department of Energy
Office of Legacy Management
626 Cochrans Mill Road
Pittsburgh, PA 15236-0940

SUBJECT: Contract No. DE-AC01-02GJ79491, Stoller
October 2007 Environmental Sampling at Canonsburg, Pennsylvania

Reference: FY 2007 LM Task Order No. ST07-101-07

Dear Mr. Craig:

The purpose of this letter is to inform you of the upcoming sampling event at Canonsburg, Pennsylvania. 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 October 1, 2007.

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

Monitor Wells (filtered)*

406A Um	410 Um	412 Um	413 Um	414B Nr	424 Um

*NOTE: Um = Unconsolidated materials; Nr = No recovery of data for classifying

Surface Locations (filtered)*

601	602	603

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

If you have any questions, please call me at 937-847-8350 ext. 320 or Mike Widdop at extension 970-248-6793.

Sincerely,

Robert Ransbottom
Project Manager

RR/lcg/mat
Enclosures (3)

cc: C. I. Bahrke, Stoller
S. E. Donivan, Stoller (e)
B. J. Gallagher, Stoller (e)
L. C. Goodknight, Stoller (e)
EDD Delivery (e)

cc w/o enclosures:
Correspondence Control File (Thru C. Weston)

V:\07101195\07101195_DocProd.doc

Site	Canonsburg	
Analyte	**Groundwater**	**Surface Water**
Approx. No. Samples/yr	6	3
Field Measurements		
Alkalinity	X	X
Dissolved Oxygen		
Redox Potential	X	X
pH	X	X
Specific Conductance	X	X
Turbidity	X	
Temperature	X	X
Laboratory Measurements		
Aluminum		
Ammonia as N (NH3-N)		
Antimony		
Arsenic		
Beryllium		
Bromide		
Cadmium		
Calcium	X	X
Chloride	X	X
Chromium		
Cobalt		
Copper		
Fluoride		
Gamma Spec		
Gross Alpha	X	
Gross Beta	X	
Iron		
Lead		
Lead-210		
Magnesium	X	X
Manganese	X	X
Molybdenum	X	X
Nickel		
Nickel-63		
Nitrate + Nitrite as N (NO3+NO2)-N		
PCBs		
Phosphate		
Polonium-210		
Potassium	X	X
Radium-226		
Radium-228		
Selenium		

Analyte	Groundwater	Surface Water
Silica		
Sodium	X	X
Strontium		
Sulfate	X	X
Sulfide		
Thallium		
Thorium-230		
Tin		
Total Dissolved Solids		
Total Organic Carbon		
Uranium	X	X
Vanadium		
Zinc		
Total No. of Analytes	11	9

Note: All analyte samples are considered filtered 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

Stoller

established 1959

Grand Junction Office

Memorandum

DATE: October 16, 2007

TO: Bob Ransbottom

FROM: Dan Sellers

SUBJECT: Trip Report

Site: Canonsburg, PA

Dates of Sampling Event: October 8, through October 10, 2006

Team Members: Mike Stott, Jim Gore, and Dan Sellers

Number of Locations Sampled: Nine locations were sampled: 6 monitor wells and 3 surface water locations. One duplicate sample was taken at monitor well 0424. A total of 10 sample sets were collected.

Locations Not Sampled/Reason: None.

Location Specific Information: The following table includes the established well type identified for each sampled well location.

Ticket Number	Location	Sample Date	Well Type/Comments	Water Levels
FLX 773	0406A	10/9/07	CAT II	11.31
FLX 778	0424	10/9/07	CAT I	14.40
FLX 780	0412	10/9/07	CAT I, QA/QC sample taken.	15.32
FLX 781	0413	10/9/07	CAT II	8.70
FLX 782	0414B	10/9/07	CAT II, Purged 1 liter before Parameters taken; large amount of iron present. Did not reach turbidity.	10.27
FLX 779	0410	10/9/07	Cat II	11.82
FLX 788	0601	10/9/07	Surface	N/A
FLX 789	0602	10/9/07	Surface	N/A
FLX 790	0603	10/9/07	Surface	N/A

Water Level Measurements: Water level measurements were taken at all sampled wells. Water level data are provided in the table above and represent depth to water (ft btoc) measurements.

Field Variance: None.

Quality Control Sample Cross Reference: An equipment blank was not necessary because dedicated or new pump head tubing was used at each location and all downhole tubing is dedicated.

False ID	True ID	Sample Type	Associated Matrix	Ticket Number
5424	0424	Duplicate	Groundwater	FLX 787

Requisition Numbers Assigned: All samples were assigned to RIN 07101195.

Sample Shipment: Samples were shipped overnight FedEx to Paragon Analytics, Inc., from Fernald, Ohio, on October 11, 2007 .

Well Inspection Summary: Well inspections were conducted at all sampled wells. Monitor well 0412 had a new lock placed on it and needs a new well cap. All other wells were in good condition.

Equipment: All wells and surface water locations were sampled using a peristaltic pump, pump head tubing, and dedicated downhole tubing. All equipment operated fine.

Institutional Controls: All gates were appropriately closed and locked during the sampling event.

Fences, Gates, Locks: Lock replaced on southern side of site near well 0410.
Signs: No problems observed.
Trespassing/Site Disturbances: None observed.

Site Issues:

Disposal Cell/Drainage Structure Integrity: N/A
Vegetation/Noxious Weed Concerns: N/A
Maintenance Requirements: None observed.

Corrective Action Taken / Needs: Well 0414B needs new dedicated poly tubing. All wells need new dedicated pump head tubing placed on existing dedicated poly tubing. Additionally, they all need to be clearly marked.

(DLS/lcg)

cc: J. R. Craig, DOE–LM (e)
C. I. Bahrke, Stoller (e)
S. E. Donivan, Stoller (e)
EDD Delivery (e)