

US EPA ARCHIVE DOCUMENT



April 20, 2011

U.S. Environmental Protection Agency  
75 Hawthorne Street  
San Francisco, CA 94105

TDD No: T02-09-10-08-0004  
Project No: 002693.2102.01RA

Attention: Harry Allen, USEPA On-Scene Coordinator  
Andrew Bain, USEPA

Subject: **Navajo Nation Water Well Sampling**  
Church Rock Chapter  
Navajo Nation

## INTRODUCTION

In October 2010 the U.S. Environmental Protection Agency (USEPA) tasked the Ecology and Environment Inc. Superfund Technical Assessment and Response Team (START) with technical assistance relating to residential water well sampling in various regions of the Navajo Nation. (Figure 1, Attachment A).

The purpose of this sampling event was to generate additional data to measure the impact of the former uranium mines on wells within the adjacent areas.

## SAMPLING ACTIVITIES

Well sampling was conducted on October 20 and 21, 2010. A total of eight wells were sampled. Table 1 (Appendix B) gives the GPS coordinates and chapter location of the wells. All of the wells are considered residential wells. Every effort was made to collect water samples in a manner consistent with resident collection and use (i.e. taps, pumps or bucket collect).

A Time Critical Quality Assurance and Sampling (QASP) Plan (Appendix D) was developed prior to sampling and followed with the following exceptions:

- Well 15R318A is no longer in use and was not sampled as tank was inaccessible.
- Well 17T-517 was not sampled due to inaccessible roads.

Water quality parameters were measured in the field using a Horiba, Ltd. multi-parameter water quality meter. The meter was calibrated daily using a buffer solution. Samples were collected and analyzed for metals, radionuclides and anions by GEL Laboratories Inc. (Charleston, SC). The QASP (Appendix D) contains all methods and volumes used in sample analysis. Table 2 (Appendix B) lists the full analyte list with associated reporting limits and action levels.

## WELL DESCRIPTIONS

### 16K-340

Well 16K-340 is a windmill powered well that feeds into an approximately 40,000 gallon covered metal tank. The well is currently in use and there is a trough and tap in the vicinity of the tank that are used to water livestock. Samples were collected from the tap in manner consistent with residential use.

**16-4-16**

Well 16-4-16 is a spring well that was powered by a hand pump. The well still contains water but the two taps used to access the well water appeared to be no longer in use. Samples were collected from the covered, below ground vault using a bucket and rope.

**Pigeon Springs Well**

The Pigeon Springs Well is a spring well that is powered by a hand pump. The well is still in use and contains an affiliated tap and trough. Samples were collected from the tap in a manner consistent with residential use.

**10-21-65 Well 17**

The 10-21-65 Well 17 Well is a spring well that is no longer in use. No trough, taps or tanks appeared to be associated with the well. It is unknown how the well was powered. Samples were collected from the covered, below ground vault using a bucket and rope.

**15R318A**

The 15R318A well is a windmill powered well that is no longer in use. The well fed in an approximately 10,000 gallon metal tank that was accessed through and tap and trough system. Residents indicated that livestock water is currently trucked in and stored in a polyethylene tank on the property.

**15T-529**

Well 15T-529 is a windmill powered well that feeds into an approximately 40,000 gallon uncovered metal tank. The well is currently in use but there is no affiliated trough or tap. Samples were collected from the top of the tank using a bucket.

**17T-545**

Well 17T-545 is a windmill powered well that feeds into an approximately 40,000 gallon covered metal tank. The well is currently in use and there is a trough and tap in the vicinity of the tank that are used to water livestock. Samples were collected from the tap in manner consistent with residential use.

**17T-589**

Well 17T-589 is a windmill powered well that feeds into an approximately 40,000 gallon covered metal tank. The well is currently in use and there is a trough and tap in the vicinity of the tank that are used to water livestock. Samples were collected from the tap in manner consistent with residential use.

**17T-519**

Well 17T-545 is a windmill powered well that feeds into an approximately 40,000 gallon covered metal tank. The well is currently in use and there is a trough and tap in the vicinity of the tank that are used to water livestock. Samples were collected from the tap in manner consistent with residential use.

**RESULTS**

Table 3 (Appendix B) gives a well specific summary of all applicable data. All laboratory data was validated by a START chemist using the *Region 9 Draft Superfund Data Evaluation/Validation Guidance*. Data validation indicated the laboratory data was acceptable with qualification as definitive data. A separate data validation report was generated under this project and is included in the project file.

This letter summarizes all activities conducted on the Navajo Water Well Sampling project. If you have any questions regarding START's activities associated with this project, please do not hesitate to contact me.

Respectfully,



Craig Tiballi  
START Member

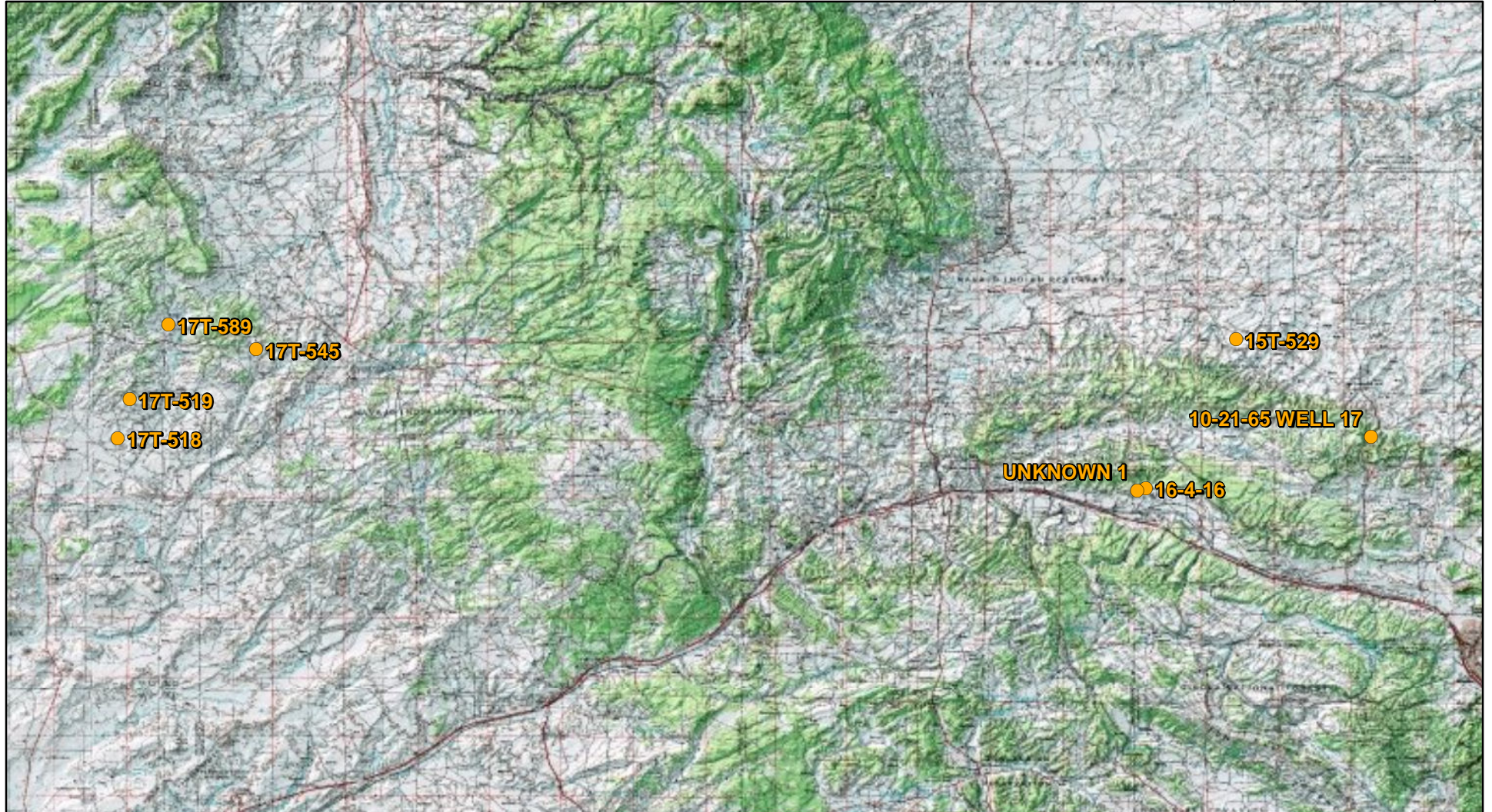
Attachments: A – Homesite Location Map  
B – Tables  
C – Photographic Documentation  
D – QASP  
E – Laboratory Analytical Results

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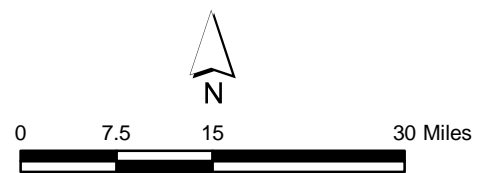


**ATTACHMENT A:  
Well Location Map**





**LEGEND**  
● Unregulated well



**Figure 1**  
**Navajo Nation**  
**Water Well Sampling**  
**Navajo Nation**



**ATTACHMENT B:  
Tables**

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**Table 1: Well Locations**

TDD:09-10-08-0004

PAN:002693.2102.01RA

	<b>Well ID</b>	<b>Chapter</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Sampled</b>
Navajo Nation Wells	10-21-65 Well 17	Crownpoint	35.609813790	-108.120762084	Yes
	16-4-16	Iyanbito	35.535030568	-108.451478386	Yes
	15T-529	Nahodishgish	35.753955645	-108.318938036	Yes
	Unknown 2 15R318A	Nahodishgish	35.696223776	-108.234445906	No
	17T-517	Steamboat	35.613142000	-109.847186000	No
	17T-518	Steamboat	35.608266690	-109.962640722	Yes
	17T-519	Steamboat	35.665779128	-109.945679459	Yes
	17T-545	Steamboat	35.738651960	-109.759558552	Yes
	17T-589	Steamboat	35.775660082	-109.888645901	Yes
	Unknown 1(Pigeon Springs Well)	Iyanbito	35.531461324	-108.464341033	Yes



**Table 2: Reporting Limits and Action levels**

TDD:09-10-08-0004

PAN:002693.2102.01RA

Analysis	Analyte	Action Level (mg/L)	Quantitation Limit (µg/L)
Anions by 300.0	Fluoride	4.0	0.10
Anions by 300.0	Chloride	250	1.0
Anions by 300.0	Nitrite as N	1.0	0.10
Anions by 300.0	Nitrate as N	10	0.10
Anions by 300.0	o-Phosphate, as P	Not Available	1.0
Anions by 300.0	Sulfate	250 (s)	0.50
Metals by 6010B	Aluminum	0.05 to 0.2	100
Metals by 6010B	Antimony	0.006	3.0
Metals by 6010B	Arsenic	0.01	10
Metals by 6010B	Barium	2.0	20
Metals by 6010B	Beryllium	0.004	5.0
Metals by 6010B	Cadmium	0.005	10
Metals by 6010B	Calcium	Not Available	1000
Metals by 6010B	Chromium	0.10	10
Metals by 6010B	Cobalt	Not Available	20
Metals by 6010B	Copper	1.3 (s)	20
Metals by 6010B	Iron	Not Available	50
Metals by 6010B	Lead	0.015	5.0
Metals by 6010B	Magnesium	Not Available	600
Metals by 6010B	Manganese	0.05 (s)	15
Metals by 6010B	Mercury	0.002	0.50
Metals by 6010B	Nickel	Not Available	20
Metals by 6010B	Potassium	Not Available	5000
Metals by 6010B	Selenium	0.05	10
Metals by 6010B	Silver	0.10 (s)	10
Metals by 6010B	Thallium	0.002	5.0
Metals by 6010B	Vanadium	Not Available	20
Metals by 6010B	Zinc	5.0 (s)	10
Gross alpha by 900.0	alpha	15 pCi/L	1.0 pCi/L
Gross beta by 900.0	beta	4 mrem/year	1.0 pCi/L
903.1	Ra-226	5 pCi/L	1.0 pCi/L
904	Ra-228	5 pCi/L	1.0 pCi/L
Isotopic Th by HASL 300 Th-01-RCmod	Th-238, 230, 232	1.0 pCi/L	1.0 pCi/L
Isotopic U by HASL 300 U-02-RC mod	U-233/234, U-235/236, U-238	1.0 pCi/L	1.0 pCi/L

Key:

mg/L = milligrams per liter;

µ/L = micrograms per Liter

pCi/L = pico Curies per Liter

(s) = National Secondary Drinking Water Regulation not enforceable and not an action limit for this assessment

Table 3: Navajo Nation Water Well Sampling Data

TDD:09-10-08-0004

PAN:002693.2102.01RA

	17T-518			17T-519			17T-545		
	Result	Units		Result	Units		Result	Units	
Water Quality	pH	8.9		pH	8.9		pH	8.8	
	Conductivity	0.10	S/m	Conductivity	0.05	S/m	Conductivity	0.09	S/m
	Turbidity	5.8	NTU	Turbidity	2.6	NTU	Turbidity	5.6	NTU
	Dissolved Oxygen	7.09	mg/L	Dissolved Oxygen	7.18	mg/L	Dissolved Oxygen	7.46	mg/L
	Temperature	14.7	°C	Temperature	14.3	°C	Temperature	12	°C
	Salinity	0.0	%	Salinity	0.0	%	Salinity	0.0	%
	Total Dissolved Solids	0.6	g/L	Total Dissolved Solids	0.3	g/L	Total Dissolved Solids	0.5	g/L
	Oxidation Reduction Potential	-2	mV	Oxidation Reduction Potential	34	mV	Oxidation Reduction Potential	-8	mV
Metals	Analyte	Result	Units	Analyte	Result	Units	Analyte	Result	Units
	Aluminum	<68	ug/L	Aluminum	<68	ug/L	Aluminum	<68	ug/L
	Antimony	<3.0	ug/L	Antimony	<3.0	ug/L	Antimony	<3.0	ug/L
	Arsenic	81.2	ug/L	Arsenic	<5.0	ug/L	Arsenic	26.8	ug/L
	Barium	11.8	ug/L	Barium	81.4	ug/L	Barium	4.96	ug/L
	Beryllium	<1.0	ug/L	Beryllium	<1.0	ug/L	Beryllium	<1.0	ug/L
	Cadmium	<1.0	ug/L	Cadmium	<1.0	ug/L	Cadmium	1.05	ug/L
	Calcium	1310	ug/L	Calcium	29000	ug/L	Calcium	813	ug/L
	Chromium	<1.0	ug/L	Chromium	<1.0	ug/L	Chromium	1.48	ug/L
	Cobalt	<1.0	ug/L	Cobalt	<1.0	ug/L	Cobalt	<1.0	ug/L
	Copper	<3.0	ug/L	Copper	22.3	ug/L	Copper	9.44	ug/L
	Iron	479	ug/L	Iron	82.2	ug/L	Iron	161	ug/L
	Lead	<3.3	ug/L	Lead	<3.3	ug/L	Lead	4.03	ug/L
	Magnesium	223	ug/L	Magnesium	6520	ug/L	Magnesium	155	ug/L
	Manganese	4.88	ug/L	Manganese	<2.0	ug/L	Manganese	3.41	ug/L
	Mercury	<0.066	ug/L	Mercury	<0.066	ug/L	Mercury	<0.066	ug/L
	Nickel	<1.5	ug/L	Nickel	<1.5	ug/L	Nickel	<1.5	ug/L
	Potassium	1890	ug/L	Potassium	3310	ug/L	Potassium	1300	ug/L
	Selenium	<5.0	ug/L	Selenium	<5.0	ug/L	Selenium	10.7	ug/L
	Silver	<1.0	ug/L	Silver	<1.0	ug/L	Silver	<1.0	ug/L
Sodium	186000	ug/L	Sodium	33200	ug/L	Sodium	175000	ug/L	
Thallium	<5.0	ug/L	Thallium	<5.0	ug/L	Thallium	<5.0	ug/L	
Vanadium	58	ug/L	Vanadium	<1.0	ug/L	Vanadium	74	ug/L	
Zinc	157	ug/L	Zinc	46.9	ug/L	Zinc	57.9	ug/L	
Radionuclides	Analyte	Result	Units	Analyte	Result	Units	Analyte	Result	Units
	ALPHA	6.58	pCi/L	ALPHA	6.81	pCi/L	ALPHA	17.2	pCi/L
	BETA	<5.0	pCi/L	BETA	<5.0	pCi/L	BETA	<5.0	pCi/L
	Pct Uranium-235	0.00	percent	Pct Uranium-235	0.00	percent	Pct Uranium-235	0.00	percent
	Radium-226	<1.0	pCi/L	Radium-226	3.10	pCi/L	Radium-226	<1.0	pCi/L
	Radium-228	<3.0	pCi/L	Radium-228	5.09	pCi/L	Radium-228	2.97	pCi/L
	Uranium-233/234	7.02	pCi/L	Uranium-233/234	2.18	pCi/L	Uranium-233/234	16.3	pCi/L
	Uranium-235/236	<1.0	pCi/L	Uranium-235/236	<1.0	pCi/L	Uranium-235/236	<1.0	pCi/L
Uranium-238	1.66	pCi/L	Uranium-238	1.22	pCi/L	Uranium-238	5.60	pCi/L	

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Table 3: Navajo Nation Water Well Sampling Data

TDD:09-10-08-0004

PAN:002693.2102.01RA

17T-589			10-21-65 WELL17			15T-529			
	Result	Units		Result	Units		Result	Units	
Water Quality	pH	8.6		pH	7.4		pH	7.8	
	Conductivity	0.21	S/m	Conductivity	0.43	S/m	Conductivity	0.13	S/m
	Turbidity	8.5	NTU	Turbidity	10.1	NTU	Turbidity	11.1	NTU
	Dissolved Oxygen	6.6	mg/L	Dissolved Oxygen	5.09	mg/L	Dissolved Oxygen	3.58	mg/L
	Temperature	15.0	°C	Temperature	13.2	°C	Temperature	16.5	°C
	Salinity	0.1	%	Salinity	0.2	%	Salinity	0.1	%
	Total Dissolved Solids	1.3	g/L	Total Dissolved Solids	2.7	g/L	Total Dissolved Solids	0.8	g/L
	Oxidation Reduction Potential	23	mV	Oxidation Reduction Potential	71	mV	Oxidation Reduction Potential	-38	mV
Metals	Analyte	Result	Units	Analyte	Result	Units	Analyte	Result	Units
	Aluminum	194	ug/L	Aluminum	1430	ug/L	Aluminum	<68	ug/L
	Antimony	<3.0	ug/L	Antimony	<3.0	ug/L	Antimony	<3.0	ug/L
	Arsenic	18.8	ug/L	Arsenic	<5.0	ug/L	Arsenic	<5.0	ug/L
	Barium	6.38	ug/L	Barium	47.9	ug/L	Barium	17.6	ug/L
	Beryllium	<1.0	ug/L	Beryllium	<5.0*	ug/L	Beryllium	<1.0	ug/L
	Cadmium	<1.0	ug/L	Cadmium	<1.0	ug/L	Cadmium	<1.0	ug/L
	Calcium	7130	ug/L	Calcium	541000	ug/L	Calcium	16500	ug/L
	Chromium	<1.0	ug/L	Chromium	<1.0	ug/L	Chromium	<1.0	ug/L
	Cobalt	<1.0	ug/L	Cobalt	1.54	ug/L	Cobalt	<1.0	ug/L
	Copper	10.7	ug/L	Copper	5.06	ug/L	Copper	30.5	ug/L
	Iron	372	ug/L	Iron	2060	ug/L	Iron	948	ug/L
	Lead	<3.3	ug/L	Lead	<16.5*	ug/L	Lead	<3.3	ug/L
	Magnesium	2870	ug/L	Magnesium	266000	ug/L	Magnesium	6220	ug/L
	Manganese	6.11	ug/L	Manganese	68.9	ug/L	Manganese	67.1	ug/L
	Mercury	<0.066	ug/L	Mercury	<0.066	ug/L	Mercury	<0.066	ug/L
	Nickel	<1.5	ug/L	Nickel	2.38	ug/L	Nickel	<1.5	ug/L
	Potassium	3280	ug/L	Potassium	9770	ug/L	Potassium	2220	ug/L
	Selenium	<5.0	ug/L	Selenium	<5.0	ug/L	Selenium	<5.0	ug/L
	Silver	<1.0	ug/L	Silver	<5.0*	ug/L	Silver	<1.0	ug/L
Sodium	402000	ug/L	Sodium	106000	ug/L	Sodium	217000	ug/L	
Thallium	<5.0	ug/L	Thallium	<5.0	ug/L	Thallium	<5.0	ug/L	
Vanadium	<1.0	ug/L	Vanadium	3.8	ug/L	Vanadium	<1.0	ug/L	
Zinc	72.7	ug/L	Zinc	12.4	ug/L	Zinc	623	ug/L	
Radionuclides	Analyte	Result	Units	Analyte	Result	Units	Analyte	Result	Units
	ALPHA	<5.0	pCi/L	ALPHA	14.5	pCi/L	ALPHA	<5.0	pCi/L
	BETA	<5.0	pCi/L	BETA	11.6	pCi/L	BETA	<5.0	pCi/L
	Pct Uranium-235	0.00	percent	Pct Uranium-235	2.05	percent	Pct Uranium-235	0.00	percent
	Radium-226	0.464	pCi/L	Radium-226	<1.0	pCi/L	Radium-226	0.584	pCi/L
	Radium-228	<3.0	pCi/L	Radium-228	<3.0	pCi/L	Radium-228	<3.0	pCi/L
	Uranium-233/234	0.754	pCi/L	Uranium-233/234	9.87	pCi/L	Uranium-233/234	<1.0	pCi/L
Uranium-235/236	<1.0	pCi/L	Uranium-235/236	0.782	pCi/L	Uranium-235/236	<1.0	pCi/L	
Uranium-238	<1.0	pCi/L	Uranium-238	5.80	pCi/L	Uranium-238	<1.0	pCi/L	
Anions				Analyte	Result	Units			
				Chloride	137	mg/L			
				Nitrate	0.191	mg/L			
				Nitrite	<0.033	mg/L			
				Ortho-phosphate	<0.66*	mg/L			
			Fluoride	1.58	mg/L				

Notes:

\*Sample diluted, detection limit increased

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Table 3: Navajo Nation Water Well Sampling Data

TDD:09-10-08-0004

PAN:002693.2102.01RA

16-4-16			PIGEON SPRINGS			
	Result	Units		Result	Units	
Water Quality	pH	7.3	pH			
	Conductivity	0.07	S/m	Conductivity	0.14	S/m
	Turbidity	3.8	NTU	Turbidity	3.3	NTU
	Dissolved Oxygen	5.05	mg/L	Dissolved Oxygen	5.26	mg/L
	Temperature	15	°C	Temperature	15.3	°C
	Salinity	0.0	%	Salinity	0.1	%
	Total Dissolved Solids	0.4	g/L	Total Dissolved Solids	0.9	g/L
	Oxidation Reduction Potential	40	mV	Oxidation Reduction Potential	33	mV
Metals	Analyte	Result	Units	Analyte	Result	Units
	Aluminum	87.7	ug/L	Aluminum	104	ug/L
	Antimony	3.6	ug/L	Antimony	<3.0	ug/L
	Arsenic	<5.0	ug/L	Arsenic	<5.0	ug/L
	Barium	199	ug/L	Barium	60.8	ug/L
	Beryllium	<1.0	ug/L	Beryllium	<1.0	ug/L
	Cadmium	<1.0	ug/L	Cadmium	<1.0	ug/L
	Calcium	16500	ug/L	Calcium	5140	ug/L
	Chromium	<1.0	ug/L	Chromium	<1.0	ug/L
	Cobalt	<1.0	ug/L	Cobalt	<1.0	ug/L
	Copper	<3.0	ug/L	Copper	67.3	ug/L
	Iron	48	ug/L	Iron	154	ug/L
	Lead	<3.3	ug/L	Lead	3.73	ug/L
	Magnesium	5060	ug/L	Magnesium	1520	ug/L
	Manganese	4.69	ug/L	Manganese	3.26	ug/L
	Mercury	<0.066	ug/L	Mercury	<0.066	ug/L
	Nickel	<1.5	ug/L	Nickel	<1.5	ug/L
	Potassium	1450	ug/L	Potassium	2960	ug/L
	Selenium	<5.0	ug/L	Selenium	<5.0	ug/L
	Silver	<1.0	ug/L	Silver	<1.0	ug/L
Sodium	116000	ug/L	Sodium	272000	ug/L	
Thallium	<5.0	ug/L	Thallium	<5.0	ug/L	
Vanadium	30.5	ug/L	Vanadium	57.1	ug/L	
Zinc	5.78	ug/L	Zinc	55.8	ug/L	
Radionuclides	Analyte	Result	Units	Analyte	Result	Units
	ALPHA	10.8	pCi/L	ALPHA	14.4	pCi/L
	BETA	<5.0	pCi/L	BETA	8.74	pCi/L
	Pct Uranium-235	0.00	percent	Pct Uranium-235	0.725	percent
	Radium-226	1.66	pCi/L	Radium-226	0.447	pCi/L
	Radium-228	0.987	pCi/L	Radium-228	3.55	pCi/L
	Uranium-233/234	6.64	pCi/L	Uranium-233/234	38.7	pCi/L
	Uranium-235/236	<1.0	pCi/L	Uranium-235/236	0.911	pCi/L
Uranium-238	3.72	pCi/L	Uranium-238	19.4	pCi/L	
Anions	Analyte	Result	Units			
	Chloride	11.5	mg/L			
	Nitrate	1.31	mg/L			
	Nitrite	<0.033	mg/L			
	Ortho-phosphate	<0.066	mg/L			
	Sulfate	21.4	mg/L			
	Fluoride	0.680	mg/L			

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**ATTACHMENT C:  
Photographic Documentation**

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# PHOTOGRAPHIC LOG

## Navajo Water Well Sampling Navajo Nation Reservation

002693.2102.01RA

T02-09-10-08-0004

**Date:**  
10/20/10

**Description:**

Well 16-4-16



**Date:**  
10/20/10

**Description:**

Pigeon Springs





# PHOTOGRAPHIC LOG

## Navajo Water Well Sampling Navajo Nation Reservation

002693.2102.01RA

T02-09-10-08-0004

**Date:**  
10/20/10

**Description:**

10-21-65 Well 17



**Date:**  
10/20/10

**Description:**

Well 15R318A





# PHOTOGRAPHIC LOG

## Navajo Water Well Sampling Navajo Nation Reservation

002693.2102.01RA

T02-09-10-08-0004

**Date:**  
10/20/10

**Description:**

15T-529



**Date:**  
10/21/10

**Description:**

17T-545







# PHOTOGRAPHIC LOG

## Navajo Water Well Sampling

Navajo Nation Reservation

002693.2102.01RA

T02-09-10-08-0004

**Date:**  
10/21/10

**Description:**  
17T-589



**Date:**  
10/21/10

**Description:**  
17T-519





# PHOTOGRAPHIC LOG

## Navajo Water Well Sampling Navajo Nation Reservation

002693.2102.01RA

T02-09-10-08-0004

**Date:**  
10/21/10

**Description:**

17T-518





**ATTACHMENT D:**  
**Time Critical Quality Assurance and Sampling Plan**

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**EPA Emergency Response Section (ERS)  
and Superfund Technical Assessment and Response Team (START)**

**Time-Critical  
Quality Assurance Sampling Plan  
For Radiation Assessment of  
Unregulated Drinking Water Sources**

Response Location: Navajo Nation Water Well Sampling / NECR Water Well Sampling,  
TDD#: T02-09-10-08-0004 / T02-09-10-08-0005

Date: October 8, 2010

Prepared by: Mike Folan \_\_\_\_\_ Date:

Reviewed by: Howard Edwards, Ecology and Environment, Inc. Date:

Andrew Bain, U.S. EPA \_\_\_\_\_ Date:

Cynthia Wetmore, U.S. EPA \_\_\_\_\_ Date:

Linda Reeves, U.S. EPA \_\_\_\_\_ Date:

\_\_\_\_\_, NNEPA \_\_\_\_\_ Date:

Approved by: Harry L. Allen, U.S. EPA \_\_\_\_\_ Date:

This sampling plan was prepared and delivered to the EPA Task Monitor:

**Prior to Sampling**       **Post Sampling (within one month of sampling)**

**This emergency sampling plan is intended to be used in conjunction with the EPA's Region 9 Emergency Response Section's Generic Data Quality Objectives (DQOs) for Time-Critical Evaluations.** This sampling plan has been designed to assist field responders in their preparation for collecting, analyzing, shipping, storing and handling samples collected during a time-critical response. The use of this generic sampling plan will involve forethought and planning that should help direct the sampling and analytical work. It is meant to be used in the case of emergency responses or time-critical responses when sampling teams may not have the opportunity to write a more thorough sampling plan. Sampling teams should always reference standard quality procedures, standard operations procedures, standard methods for sampling and analytical guidance.

US EPA ARCHIVE DOCUMENT

The development of this generic plan will improve the documentation, communication, planning, and overall quality associated with the sampling and analysis by:

- 1) encouraging field teams to consider their goals and objectives before the generation of environmental data,
- 2) documenting predetermined information in a standardize format,
- 3) increasing the communication between sampling personnel and decision makers, and
- 4) detailing expectations and objective before samples are collected.

**1.0 Introduction and Background.** *Describe the site and specify the geographic boundaries for the site and any specific areas of concern. What is the problem, what precipitated the response, which agencies and other entities (e.g., contractors) are on site, who has taken the lead for the response and for environmental clean-up actions?*

Many households on the Navajo Reservation obtain their water from wells that were drilled or dug without previously obtaining permits and that do not conform to ordinary practices for well completion. The wells are often used for a combination of residential, domestic or agricultural purposes. Some households use surface water sources, rather than groundwater, that are also of poor quality. Nearly all of these water sources are used or consumed without treatment. USEPA Region 9 and the Navajo Nation EPA need to obtain good information about contaminants, in particular radioactive contaminants, in these water sources, using the National Primary Drinking Water Regulations (NPDWR) Maximum Contaminant Levels (MCLs) For Drinking Water that are listed in 40CFR141 Subpart G, and most notably in 40CFR141.66, as benchmarks for water quality.

The USEPA has agreed to conduct well sampling as a one-time event. Sampling will be performed under two separate projects: (1) Navajo Nation Well Sampling and (2) Northeast Church Rock Water Well Sampling. Where a determination is made that a significant imminent threat exists, the data will be evaluated to identify sources that exceed federal primary and secondary maximum contaminant levels to determine next steps. The information will be given to those responsible for the operation of the water sources and residents using the sources on a case-by-case basis, as deemed appropriate by the Navajo Nation EPA. The USEPA will be responsible for the analysis of metals, radioactive parameters and additional water parameters.

One area of focus in the October 2010 sampling event will be approximately 10 wells within the Eastern Agency that were sampled in 2008 but require confirmation samples for data validation. This will be referred to as the Navajo Nation Well Sampling project.

The Centers of Disease Control (CDC) and USEPA sampled a total of 199 water sources during 2006/2007 and 2008 respectively, from non-municipal water sources within the Navajo Nation. A significant portion of the water sources were found to contain metals and/or radioactive parameter analytes which exceeded site-specific action levels determined by the USEPA including 22 water sources which exceeded primary drinking water standards for radionuclide's.

The other area of focus in the October 2010 sampling event will be approximately 7 wells in the vicinity of the Northeast Church Rock Mine near Gallup, NM. This project will look at the impact of Northeast Church Rock Mine on residential wells in that specific area. This project will be referred to as the Northeast Church Rock Water Well Sampling project.

The START and a commercial laboratory will assist with this investigation. The USEPA's States, Tribes, and Site Assessment Section is the lead USEPA section for the assessment. After the assessment data is collected, the EPA's Emergency Response Section will evaluate the data to determine whether there is an imminent and substantial threat to human health which could prompt further actions by the EPA under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) authority.

Ref: United States Army Corps of Engineers, IAG No. DW96955370-01-0, Data Quality Assurance Summary, Section 2, Field Operation Summary, Revision 3, December 2000

**2.0 Objectives.** *Brief statement on the general project objective. What is the overall goal or objective? Specific objectives are summarized in Table D in Section 3.5.*

The primary objective of this assessment is to verify previous analytical data and determine whether unregulated drinking water sources are contaminated above MCLs for the analytes investigated.

**2.1 Data Use Objectives.** (How will the data be used?)

**Radiation Monitoring Data**

Data from direct-reading instruments will be used:

- 1)  To be compared with established background radiation data.
- 2)  To compare with site-specific action levels or risk-based action levels to determine if acute or chronic health threats exist.
- 3)  To assist with determining the area of impact due to a release.
- 4)  To assist with determining whether radioactive materials have contaminated specific areas or movable objects.
- 5)  To assist in the identification of the potential source of radiation.
- 6)  Other objectives:

**Data from Collected Sample**

Analytical data for soil, water, air or other media samples, if generated, will be used:

- 7)  To be compared with site-specific action levels or risk-based action levels (e.g., EPA MCLs) to assist in determination if health threats exist.
- 8)  Other objectives: Provide Navajo agencies and public with information regarding quality of unregulated water sources that residents, against the advice of Navajo Nation EPA, use for potable water.

**2.2 Objectives.** (What are you proposing to do?)

**Radiation Measurement**

- 1)  Measurement to establish the presence or absence of radiation above site-specific action levels or risk-based action levels in the area of concern. (Initial assessment and post removal confirmation).
  - Airborne
    - Static
      - Activity
      - Dose Rate
      - Dose
    - Scanning
      - Activity
      - Dose Rate
  - Surface
    - Static
      - Activity
      - Dose Rate
      - Dose
    - Scanning
      - Activity
      - Dose Rate



- 2)  Measurement to determine the location of contamination within the area of concern.
  - Airborne (area)
  - Surface
  
- 3)  Activity screening to establish control points (exclusion, decontamination and support zones).
  - Airborne
    - Static
    - Scanning
  - Surface
    - Static
    - Scanning
  
- 4)  Activity screening to determine type of radiation.
  - Airborne
    - Static
    - Scanning
  - Surface
    - Static
    - Scanning
  
- 5)  Other:

**Sample Screening**

- 6)  Activity screening of samples for evaluation prior to definitive analysis.
- 7)  Other:

**Sampling**

- 8)  Surface soil sampling to estimate the lateral extent of contamination
  - Over specific source area(s) or areas of concern
  - Over the entire site
  - Off-site
  
- 9)  Subsurface soil sampling to estimate the vertical extent of contamination
  - Over specific source area(s) or areas of concern
  - Over the entire site
  - Off-site
  
- 10)  Air sampling to estimate airborne extent of contamination
  - Over specific source area(s) or areas of concern
  - Over the entire site
  - Off-site
  
- 11)  Wipe sampling to estimate removable extent of contamination
  - Over specific source area(s) or areas of concern
  - Over the entire site

Off-site

- 12)  Groundwater sampling to estimate extent of contamination  
 Over specific source area(s) or areas of concern  
 Over the entire site  
 Off-site

- 13)  Surface water sampling to estimate extent of contamination  
 Over specific source area(s) or areas of concern  
 Over the entire site  
 Off-site

- 14)  In-situ surface sampling to estimate extent of contamination  
 Over specific source area(s) or areas of concern  
 Over the entire site  
 Off-site

- 15)  In-situ airborne sampling to estimate extent of contamination  
 Over specific source area(s) or areas of concern  
 Over the entire site  
 Off-site

- 16)  Other:

**2.3 Matrices**

- Airborne (area) Monitoring
- In-situ measurement
  - Surface soil
  - Subsurface soil
  - Other (specify): floor, wall, and ceiling surface dose rate, area dose rate, and floor activity
- Surface soil
- Sub-surface soil
  - Depth(s):
- Wipe (removable contamination)
- Radon-222
- Particulates in air
- Water
  - : Surface water
  - : Groundwater
  - : Tanks or other containers
  - Wastewater
- Containerized waste
  - Solid
  - Liquid
- Other:

**2.4 Data Type**

In general, data type and data needs should be decided prior to data generation. The data can be generally divided into three categories: definitive methodology data (referred to as definitive data for brevity and generally generated using standardize methods), non-definitive methodology data (also referred to as screening data) and screening data with at least 10% definitive data confirmation (referred to as collaborative data). The generation of definitive data is preferable, however in emergency and time critical situations where definitive data is not available, non-definitive data should be generated. Note that the data type is not an indicator of precision, accuracy or documentation of completeness or quality! Reported data should be verified (by a party other than the laboratory) as meeting specific quality control and data category requirements by following a verification or validation procedure. Refer to the START or ERS Quality Assurance Plans for specific quality parameters and requirements.

Check appropriate box(es):

**For radiation monitoring data generated during the assessment and removal,**

- Time-Critical Screening Quality Data will be generated The data by itself may not be verifiable. The data will be reported for evaluation to make a decisions.

**For sampling data generated during the assessment and removal,**

- 1  **Time-Critical Screening Quality Data** will be generated. The data by itself may not be verifiable. **Due to the time critical situation, the data must be reported and may be used to make decisions.**
- 2a  **Time-Critical Collaborative Data** will be generated (screening data with at least 10 percent definitive data). Data using non-definitive analytical methodologies will be generated. **Due to the time critical situation, the data must be reported and may be used to make decisions prior to generation of definitive data.** The screening data by itself may not be verifiable. Screening data will be evaluated and reported with definitive data at a later time.
- 2b  **Collaborative Data Sets** will be generated (screening data with 10 percent definitive data). Data using non-definitive analytical methodologies will be generated. **Data will not be reported until it is evaluated against definitive data.**
- 3a  Time-Critical **Definitive Data Sets** will be generated without validation. The sampling and analysis must be done on an emergency basis. **Due to the time critical situation, the preliminary data must be reported and used for comparison without validation. Analytical data packages will be required. However, since the data was not used or intended for decision making, validation of the data package will not be performed.** (Document generic DQO deviation in Section 4.4)
- 3b  **Time-Critical Definitive Data Sets** will be generated with validation. The sampling must be done on an emergency basis. **Due to the time critical situation, preliminary data must be reported and may be used to make decisions without validation. The generated analytical documentation packages will be reviewed and validated. Qualified data will be reported after validation.**
- 3c  **Definitive Data Sets** will be generated with third-party validation. **Full documentation will be required. Analytical data packages will be reviewed and validated prior to reporting.**

## 2.5 Contaminants of Concern

The radiation parameters of concern, proposed analytical method or Field Operating Procedure (FOP), proposed action levels and available reporting limit are summarized in Table A-1. Metals of concern are summarized in Table A-2. If other analytes of concern exist, they should be addressed in a separate QASP.

<b>Table A-1 Radiation of Concern</b>			
<b>Radiation Type (check all that apply)</b>	<b>Proposed Monitoring Method</b>	<b>Proposed Action Level</b>	<b>Available Reporting Limit</b>
<input type="checkbox"/> Alpha Particles			
<input type="checkbox"/> Beta Particles			
<input type="checkbox"/> Gamma Rays			
<input type="checkbox"/> Neutrons			
<input type="checkbox"/> Radionuclide Identification	Gamma Spectroscopy	Qualitative	Qualitative
<b>Radionuclides of Concern</b>			
<b>Radionuclide (list all of concern)</b>	<b>Proposed Analytical Method</b>	<b>Proposed Action Level</b>	<b>Available Reporting Limit</b>
<input checked="" type="checkbox"/> Gross alpha	EPA Method 900 or equivalent	15 pCi/L <sup>(1)</sup>	1.0 pCi/L
<input checked="" type="checkbox"/> Gross beta and photon radioactivity	EPA Method 900 or equivalent	1.0 pCi/L <sup>(2)</sup>	1.0 pCi/L
<input checked="" type="checkbox"/> Radium-226	EPA Method 903.1 or equivalent	5 pCi/L <sup>(3)</sup>	1.0 pCi/L
<input checked="" type="checkbox"/> Radium-228	EPA Method 904.0 or equivalent	5 pCi/L <sup>(3)</sup>	1.0 pCi/L
<input checked="" type="checkbox"/> Isotopic Uranium (233/234, 235/236, 238)	HASL 300 U-01-RC mod	1.0 pCi/L <sup>(4)</sup>	1.0 pCi/L

<input checked="" type="checkbox"/> Isotopic Thorium (228, 230, 232)	HASL 300 Th-01-RC mod	1.0 pCi/L	1.0 pCi/L
Other Data Collection Activity (non-radiological) (circle all that apply)	<input checked="" type="checkbox"/> GPS <input checked="" type="checkbox"/> Visual      Interviews      Magnetometer Other Geophysical      Modeling      File Search Water quality parameters <sup>(5)</sup> (pH, temperature, conductivity, DO, salinity, TDS, Turbidity, ORP) Photograph of water source		

Add additional pages if necessary.

Key:

- (1) Includes radium-226 but excludes uranium and radon.
- (2) The MCLG is listed at zero. In this specific case 1.0 pCi/L is the lowest available reporting limit. The MCL is stated as 4 mrem/yr for man-made radionuclides; the annual dose equivalent to the total body or any internal organ is 4 mrem/yr.
- (3) Action level of 5 pCi/L is for combined radium-226 and radium-228.
- (4) Method will measure specific Uranium isotope activity rates. Total Uranium MCL is 30 ug/L.
- (5) Water quality parameters will be measured real time with an appropriate water quality instrument that reads all listed parameters.

Table A-2 Metals of Concern			
Metal (check all that apply)	Proposed Monitoring Method	Proposed Action Level	Available Reporting Limit
<input checked="" type="checkbox"/> Target Analyte List Metals	EPA 6010 B	See Table J	See Table J
Other Data Collection Activity (non-radiological) (circle all that apply)	<input checked="" type="checkbox"/> GPS <input checked="" type="checkbox"/> Visual      Interviews      Magnetometer Other Geophysical      Modeling      Photography      File Search		

**3.0 Approach and Sampling Methodologies**

**3.1 Sampling Approach**

Monitoring approach that is to be used with monitoring instruments (select approach):

- 1)  Due to the lack of site information the approach will be determined in the field based on professional judgment of START.
- 2)  Due to the lack of site information the approach will be determined in the field based on professional judgment of USEPA.
- 3)  Due to the lack of site information the approach will be determined in the field based on professional judgment of local regulator.
- 4)  Judgmental (Biased)
- 5)  Random
- 6)  Systematic- Non Search
- 7)  Transects
- 8)  Search-Grid (Systematic planning using tools like Visual Sample Plan or DQO-PRO)

If a search-grid, specify grid type (circle one):  Not Applicable  Square  Triangle  Rectangle

Size of contamination hot-spot to be detected:

Shape of hot-spot (circle one):  Circle  Elliptical  Elongated-Elliptical

Required Grid Spacing:

Acceptable probability of missing hot-spot (circle one):  5 %  10 %  20%  40%

- 9)  MARSSIM Final Status Survey (Documented in an attached document)

Sampling approach that is to be used to select samples (select approach):

- 1  High biased with radiation sampling instruments
- 2  Low biased with radiation sampling instruments
- 3  Random
- 4  Systematic-- Non Search
- 5  Transects
- 6  Search-Grid
- 7  Judgmental (Biased): Wells will be sampled for the NECR well project based on the vicinity to the NECR mine. Wells will be sampled for the Navajo Nation well project based data gaps from the previous investigations. Wells for both projects have been selected due to their use as community drinking water sources.

If a search-grid, specify grid type (circle one): **Not applicable** Square Triangle Rectangle

Indicate the size of contamination hot-spot to be detected:

Indicate the shape of hot-spot (circle one): Circle Elliptical Elongated-Elliptica

Indicate the required Grid Spacing:

Indicate the acceptable probability of missing hot-spot (circle one):

5 % 10 % 20% 40%

- 7  MARSSIM Final Status Survey (Documented in an attached document)



### 3.2 Field Analysis Equipment

Field analysis equipment requirements are summarized in Table B-1 .

Table B-1 Field Analytical Equipment				
Monitoring Equipment Specify the radiation monitoring instrument to be used. Select the appropriate boxes.	Meter range	Probe	Amount	Resource/Contractor
<input type="checkbox"/> Ludlum Model 19 Micro R Meter, (Gamma)	0-5000 $\mu$ R/hour	Integrated with Meter		
<input type="checkbox"/> Ludlum Model 3-97 (Gamma)	0-3000 $\mu$ R/hour	Integrated with Meter		
<input type="checkbox"/> Ludlum Model 44-38 Beta and Gamma	0-3000 $\mu$ R/hour 0-200 $\mu$ R/hour	Integrated with Meter. <input type="checkbox"/> External gamma/beta energy compensating Geiger-Mueller		
<input type="checkbox"/> Ludlum Model 2241-2 Ratemeter	0.0 cpm- 999 kcpm or 0.1-999 $\mu$ R/hour	<input type="checkbox"/> Pancake Probe Ludlum Model 44-9 <input type="checkbox"/> Alpha Scintillator Ludlum Model 43-90 <input type="checkbox"/> Beta Scintillator Ludlum Model 44-116 <input type="checkbox"/> Gamma Ludlum Model 44-10 <input type="checkbox"/> Gamma Ludlum Model 44-20		
<input type="checkbox"/> Ludlum Model 2221 Ratemeter/Scaler		<input type="checkbox"/> Alpha Scintillator Ludlum Model 43-90 <input type="checkbox"/> Beta Scintillator Ludlum Model 44-116 <input type="checkbox"/> Gamma Ludlum Model 44-10		
<input type="checkbox"/> Ludlum Model 192 Micro R Meter (Gamma)	0-5000 $\mu$ R/hour	Integrated with Meter		
<input type="checkbox"/> Bicon Surveyor M Ratemeter	0 cpm- 1,000 kcpm	<input type="checkbox"/> Pancake Probe PGM <input type="checkbox"/> Scintillator G1		
<input type="checkbox"/> BNC SAM 935 Gamma Spectrometer	0.01-99 $\mu$ R/hour	Spectrometer Integrated with Meter		
<input type="checkbox"/> Eberline RO20 Ion Chamber (Beta and Gamma)	0-50 R/hour	Integrated with Meter		
<input type="checkbox"/> Bicon Model 2221 Portable Scaler Ratemeter	50-5000k cpm	<input type="checkbox"/> Gamma Ludlum Model 44-10 <input type="checkbox"/> Alpha Scintillator Ludlum Model 43-90 <input type="checkbox"/> Beta Ludlum Model 44-116		
<input type="checkbox"/> SAIC Exploranium GR-130 mini-SPEC (gamma spectrometer)	0- 65,535 cps 1 $\mu$ R/hour- 5mR/hour	Spectrometer Integrated with Meter		

<input type="checkbox"/> Canberra AN/UDR-14 Mini-Radiac Monitor (gamma dosimeter)		Integrated with dosimeter		
<input type="checkbox"/> Ludlum Model 15 (gamma, beta, neutrons)		<input type="checkbox"/> Neutrons Ludlum Model 42-9BF <input type="checkbox"/> Gamma/beta Ludlum Model 44-7		
<input type="checkbox"/> Ludlum Model 3030 (alpha/beta counter)				
<input type="checkbox"/> Ludlum Model 78 Stretch Scope (gamma)				
<input type="checkbox"/> Ludlum Model 239-1F Floor Monitor (alpha and beta)				
<input type="checkbox"/> Other:				
<input type="checkbox"/> Other:				
<input type="checkbox"/> Other:				
Non Radiation Detection Analytical Equipment				
Monitoring Equipment Specify the Non-radiation monitoring instrument to be used. Select the appropriate boxes.	Make	Model	Amount	Resource/Contractor
<input type="checkbox"/> X-Ray Fluorescence (XRF) Device [for metals]	Innov-X			
<input type="checkbox"/> X-Ray Fluorescence (XRF) Device [for metals]	<input type="checkbox"/> Metals			
<input checked="" type="checkbox"/> Other: Water quality meter	YSI	To be determined		U.S. EPA
<input checked="" type="checkbox"/> Other: Water level meter	Solinst	To be determined		U.S. EPA
<input type="checkbox"/> Other:				
<input type="checkbox"/> Other:				
Check Standard for Analytical Instruments				
STANDARD	Type	Model	Amount	Resource/Contractor
<input type="checkbox"/> Metals	NIST	SRM 2709 SRM 2710 SRM 2711 Silicon Dioxide Blank		
<input type="checkbox"/> Metals	EPA QATS			

<input type="checkbox"/> Alpha radioisotope Check Source				
<input type="checkbox"/> Beta radioisotope Check Source				
<input type="checkbox"/> Gamma radioisotope Check Source	Cs-137			
<input type="checkbox"/> Other:				
<input type="checkbox"/> Other:				

### 3.3 Field Sampling Equipment

Field equipment requirements are summarized in Table B-2.

Table B-2 Field Sampling and Decontamination Equipment				
Analyses and Matrix	Sampling Equipment	Dedicated or Reusable	Decontamination Solution	Resource/ Contractor
All	Pre-existing monitoring well pump	N/A	Not required	Not Applicable
All	Polypropylene bailer with filament line, or 500 ml-1 L polypropylene sampling container	Dedicated	Not required	START

### 3.4 Field Methods and Procedures

#### 3.4.1 Sample/Measurement Locations.

Sample locations and location name are summarized in Attachment A. Seven wells will be sampled in the NECR mine region with one duplicate sample to be selected at random in the field depending on the ease of sample collection. Additionally, ten wells will be sampled at specific locations in the Eastern Agency of the Navajo Nation with one duplicate sample to be selected at random in the field depending on the ease of sample collection. Due to drought conditions, seasonal weather activity and/or access issues, some sources may not be able to be sampled.

Water sample access points are expected to be variable in type. Some may have pumps (wind-, electric-, or hand-powered), some may have taps (spigots), and some may need to be bailed. The preferred sampling method at each groundwater sampling location will be to collect the water in the same manner that the typical water source user obtains the water. Therefore, water sources will not be purged prior to sampling. When feasible, water temperature, pH, dissolved oxygen, conductivity, oxidation reduction potential, salinity, turbidity and total dissolved solids readings will be obtained at the sampling location. Due to the season and high elevations of some of the sampling locations, some water sampling locations may be iced over. If no liquid water component can be obtained (e.g., by breaking away covering ice), the sample cannot be collected.

#### Background Measurements

Background samples are not required since attribution is not within the scope of the assessment.

### Groundwater Sampling

Groundwater samples will be collected in accordance with the EPA's Emergency Response Team (ERT) standard operating procedure (SOP) number 2007, Groundwater Well Sampling. If possible, the depth from the top of the well casing to the water level will be measured in accordance with ERT's SOP number 2043, Manual Water Level Measurements. These SOPs will be followed if appropriate and possible. Each location will be assessed to determine the most appropriate method to collect a representative sample. The method of sample collection will be documented in the field logbook.

### Surface Water Sampling

Surface water samples will be collected in accordance with ERT's SOP number 2013, Surface Water Sampling. Each location will be assessed to determine the most appropriate method to collect a representative sample. The method of sample collection will be documented in the field logbook.

### Container Sampling

Container samples will be collected in accordance with ERT's SOP number 2010, Tank Sampling. Each location will be assessed to determine the most appropriate method to collect a representative sample. The method of sample collection will be documented in the field logbook.

## **3.4.2 Sample Labeling and Documentation**

### Sample Jar Labels

Sample labels will clearly identify the particular sample and should include the following:

1. Site name
2. Time and date samples were taken
3. Sample preservation
4. Analysis requested
5. Sample location and/or identification number

Sample labels will be securely affixed to the sample container.

### Chain of Custody Record

A chain of custody record will be maintained from the time the sample is taken to its final deposition. Every transfer of custody must be noted and signed for, and a copy of this record kept by each individual who has signed. When samples (or groups of samples) are not under direct control of the individual responsible for them, they must be stored in a secured container sealed with a custody seal.

The chain of custody record should include (at minimum) the following:

1. Sample identification number
2. Sample information
3. Sample location
4. Sample date and time
5. Names(s) and signature(s) of sampler(s)
6. Signature(s) of any individual(s) with control over samples

### Custody Seals

Custody seals demonstrate that a sample container has not been tampered with or opened. The individual in possession of the sample(s) will sign and date the seal, affixing it in such a manner that the container cannot be opened without breaking the seal. The name of this individual, along with a description of the samples packaging, should be noted in the field book.

All sample documents will be completed legibly in ink. Any corrections or revisions will be made by lining through the incorrect entry and by initialing the error. These include the logbooks, the chain of custody forms, this field QASP and any other tracking forms.

### Field Logbook

The field logbook is essentially a descriptive notebook detailing site activities and observations so that an accurate account of field procedures can be reconstructed in the writer's absence. All entries will be dated and signed by the individuals making the entries and will include the following:

1. Site name and project number
2. Names of sampling personnel
3. Dates and times of all entries (military time preferred)
4. Descriptions of all site activities, especially sampling start and ending times. Include site entry and exit times
5. Noteworthy events and discussions
6. Weather conditions
7. Site observations
8. Identification and description of samples, sampling method, and locations
9. Conditions that may influence radiation measurements (objects, geometry, source material)
10. Subcontractor information and names of on-site personnel
11. Date and time of sample collections, along with chain of custody information
12. Record of photographs
13. Site sketches
14. Exact times of various activities and occurrences related to sampling
15. Deviations from standard procedures or methods and the rationale for the deviations.

An electronic database will be generated for this project that includes information listed above combined with validated data.

### 3.4.3 Sample Containers and Preservatives

Containers and preservatives are summarized in Table C.

### 3.5 Analytical Methods and Procedures

The analytical methods per sample and sample location are presented in Table D. General field QC considerations and requirements are presented in Table E.

Table C Containers and Preservatives Water Samples				
Analyses	Laboratory	Container Type (per sample)	Preservation Method	Holding Time
Gross alpha/beta, EPA Method 900.0	GEL Laboratories	Three 1-liter HDPE (A total of 4 liters for MS/MSD sample)	pH<2.0 HNO <sub>3</sub> 4 ± 2 degrees Celsius	180 days
Ra-226/228, EPA Method 903.1/904.0			pH<2.0 HNO <sub>3</sub> 4 ± 2 degrees Celsius	180 days
TAL Metals EPA Method 9310	GEL Laboratories	One 500-ml HDPE (1000 ml for MS/MSD)	pH < 2.0 HNO <sub>3</sub> 4 ± 2 degrees Celsius	180 days 14 days mercury
Nitrate/Nitrite, EPA 300.0 Ortho Phosphate EPA 300.0	GEL Laboratories	One 500-ml HDPE (No additional volume required for QC)	4 ± 2 degrees Celsius	48 hours
Chloride EPA 300.0 Fluoride EPA 300.0 Sulfate EPA 300.0			4 ± 2 degrees Celsius	28 days
Isotopic Thorium (238, 230, 232) (HASL 300 Th-01-RC-mod)	GEL Laboratories	One 1-Liter HDPE	pH < 2.0 HNO <sub>3</sub> 4 ± 2 degrees Celsius	180 days
Isotopic Uranium (233/234, 235/236, 238) (HASL 300 U-02-RC mod)	GEL Laboratories	One 1-Liter HDPE	pH < 2.0 HNO <sub>3</sub> 4 ± 2 degrees Celsius	180 days
2H/1H and 18O/16O analysis of water	Isotech Laboratories	One 125 ml HDPE	4 ± 2 degrees Celsius	180 days

**Table D**  
**Sample Locations and Data Objective Summary**

Sampling Locations and Identifiers should correspond to location indicated on Figure A

Sample Locations	Sample Identifiers	Analytical Method Refer to Table A-1 and/or A-2	Data Use Objective(s) Refer to Section 2.1	Data Category Refer to Section 2.4	Samples & Matrix
All	The following code will be used for identifiers: W-#####-# W = Well #####-well ID	All as indicated in Table A-1 and A-2	7	3c	Radio-nuclides, metal / water



### 3.6 Quality Assurance and Quality Control

QA/QC considerations and requirements for field use of radiation monitoring instruments are presented in Table E-1.

Table E-1 Quality Control Samples and Data Quality Indicator Goals			
QC or QC Sample	Number/Frequency	Data Quality Indicator Goals & Evaluation Criteria	Site specific Comments
FIELD RADIATION MONITORING SPECIFIED QA/QC			
Battery Check	At least once per day	Battery must have sufficient charge (see operating manual for minimum voltage requirements for some meters). Check should be documented.	Not Applicable
Background Check	At least one set of measurements per day should be collected from an area believed to be unaffected by source contamination. Background may have to be determined off-site.	Background rates should be documented. Documented detections should be at least 2 times background.	Not Applicable
Field Duplicates or Replicates	Occasionally recheck a monitored area to determine if any variance is noted.	< 35 RPD%	Not Applicable
Reference Source Check	Check in morning or before first use, mid-day, and end of day for each day of use. If instrument is used on consecutive days then subsequent morning checks can be eliminated.	< 35 RPD%	Not Applicable
FIELD SAMPLE RADIATION MONITORING SPECIFIED QA/QC			
Battery Check	At least once per day	Battery must have sufficient charge. Check should be documented	Not Applicable
Background	At least one set of reading per day should be collected from an area believed to be unaffected by source contamination. Background may have to be determined off-site	Background rates should be documented. Documented detections should be at least 2 times background.	Not Applicable
Blank	Check a sample of standard that is documented to be non-detect every 20 samples.	Blank sample rates should be documented. Documented detections should be at background.	Not Applicable
Field Duplicates or Replicates	Recheck at every 10 samples.	< 35 RPD%	Not Applicable
Reference Source	At least one set of source reading per day should be documented.	< 35 RPD%	Not Applicable
<sup>1</sup> SDG = Sample Delivery Group (Maximum 20 samples) <sup>2</sup> RPD = Relative Percent Difference <sup>3</sup> %R = Percent Recovery			

General field sampling and analytical QA/QC considerations and requirements are presented in Table E-2.

**Table E-2  
Quality Control Samples and Data Quality Indicator Goals**

QC Sample	Number/Frequency	Data Quality Indicator Goals & Evaluation Criteria	*MANDATORY* Site specific Comments
FIELD SPECIFIED QA/QC			
<b>Background or reference location sample</b> Air: up-wind. Surface soil: up-slope. Surface water: upstream. Ground water: up-gradient.	At least one sample should be collected from an area believed to be unaffected by source contamination.	A contaminated sample should be at least two times background.	Not required
<b>Field Blanks</b> Required for water.	1 per SDG <sup>1</sup> , per matrix, per method	A contaminated sample should be at least two times the blank.	Field blanks will be prepared for each SDG shipped to each laboratory. Field blanks will be prepared from store-bought distilled water.
<b>Equipment Blanks</b> Required only when the use of decontaminated non-dedicated equipment is involved.	1 per SDG, per matrix, per method	Source samples should be at least two times the blank.	Not required
<b>Field Duplicates or Replicates</b> Required as needed by sampling objectives. The procedure for collecting the duplicate samples can greatly affect the reproducibility.	1 per SDG, per matrix, per method	Water - 25% RPD <sup>2</sup> Soil - 35% RPD <sup>2</sup> Other - 35% RPD <sup>2a</sup>	10% duplicates
<b>Performance Standards</b>	1 per project, per matrix, per method (if required by project)	75 -125 %R <sup>3</sup>	Not required
SELECTED LABORATORY QA/AC			
Method Blank	1 per SDG, per matrix, per method	Standards and samples should be at least 3 times the blank.	Mandatory.
Matrix Spike	1 per SDG, per matrix, per method on field designated sample.	75 -125 %R	Designate sample on COC.
Matrix Spike Duplicate or Replicate	1 per SDG, per matrix, per method on field designated sample.	≤20 RPD for metals	Designate sample on COC.
Second Source Reference Standards	1 per SDG, per matrix, per method	75 -125 %R	If available.
Internal Standards	All samples	50 -200 %R	All GC/MS and some GC analyses only.
Laboratory Control Standards	1 per SDG, per matrix, per method	75 - 125 %R	Per method for organic analyses.

<sup>1</sup> SDG = Sample Delivery Group (Maximum 20 samples)

<sup>2</sup> RPD = Relative Percent Difference

<sup>3</sup> %R = Percent Recovery

US EPA ARCHIVE DOCUMENT

#### 4.0 Project Organization and Responsibilities

##### 4.1 Schedule of Sampling Activities

Sampling activities are summarized in Table F.

<b>Table F Proposed Schedule of Work For Sampling Activities</b>		
<b>Activity</b>	<b>Start Date</b>	<b>End Date</b>
Collection of drinking water samples	October 2010	October 2010
Data validation	November 2010	November 2010
Draft Report	December 2010	December 2010
Final Report	January 2010	January 2010

Resultant data will be validated by a chemist experienced in data validation.

##### 4.2 Project Laboratories

Laboratories used for this project are summarized in Table G.

<b>Table G Laboratories</b>	
<b>Lab Name/ Location</b>	<b>Methods</b>
Isotech Laboratories, Inc Steve Pelphrey 1308 Parkland Court Champaign, IL 61821 Office: 217-398-3490 Email: steve@isotechlabs.com	2H/1H and 18O/16O analysis of water
GEL Laboratories, Charleston, SC Ship to: Jake Crook Project Manager GEL Laboratories, LLC 2040 Savage Road Charleston, SC (USA) 29407 Direct: 843.769.7390 Main: 843.556.8171 Fax: 843.766.1178 E-mail: jhc@gel.com	EPA Methods 900.0, 903.1, and 904.0  EPA Methods 9310  HASL 300 U-02 RC mod HASL 300 Th-01 RC mod  EPA Method 300

### 4.3 Project Personnel and Responsibilities

Personnel and responsibilities are summarized in Table H.

Table H Sample Team(s) Personnel	
Personnel (Agency)	Responsibility
Harry Allen, EPA ERS	Task Monitor
Mike Folan, START	Project Manager
Howard Edwards, START	Quality Assurance Officer
Craig Tiballi, START	Field Monitoring and Sampling
NNEPA and/or DiNEH	Sampling Team (TBD)

### 4.4 Modification or Additions to the Generic Data Quality Objective for Emergency and Time Critical Sampling

Review the generic DQO to verify that the actual project objectives were similar to generic DQO. Project specific modification to the generic DQO statements for this are summarized in Table I. Also indicate which DQO step corresponds to the addition or modification.

Table I DQO Modifications and Additions	
Additions or Modifications to the Generic DQO Output Statements	DQO Step

**Table J  
Reporting Limits, Action Levels, and Quality Control Limits**

Analysis	Analyte	Action Level (mg/L)	Quantitation Limit (µg/L)	Duplicate RPD	Matrix Spike	Matrix Spike RPD
Anions by 300.0	Fluoride	4	0.10	25	75-125	20
Anions by 300.0	Chloride	250	1.0	25	75-125	20
Anions by 300.0	Nitrite as N	1	0.10	25	75-125	20
Anions by 300.0	Nitrate as N	10	0.10	25	75-125	20
Anions by 300.0	o-Phosphate, as P	Not Available	1.0	25	75-125	20
Anions by 300.0	Sulfate	250 (s)	0.50	25	75-125	20
Metals by 6010B	Aluminum	0.1	100	25	75-125	20
Metals by 6010B	Antimony	0.1	100	25	75-125	20
Metals by 6010B	Arsenic	0.01	10	25	75-125	20
Metals by 6010B	Barium	2	20	25	75-125	20
Metals by 6010B	Beryllium	0.005	5	25	75-125	20
Metals by 6010B	Cadmium	0.01	10	25	75-125	20
Metals by 6010B	Calcium	Not Available	1000	25	75-125	20
Metals by 6010B	Chromium	0.10	10	25	75-125	20
Metals by 6010B	Cobalt	Not Available	20	25	75-125	20
Metals by 6010B	Copper	1.3 (s)	20	25	75-125	20
Metals by 6010B	Iron	Not Available	50	25	75-125	20
Metals by 6010B	Lead	0.015	5	25	75-125	20
Metals by 6010B	Magnesium	Not Available	600	25	75-125	20
Metals by 6010B	Manganese	0.05 (s)	15	25	75-125	20
Metals by 6010B	Mercury	0.002	0.5	25	75-125	20
Metals by 6010B	Nickel	Not Available	20	25	75-125	20
Metals by 6010B	Potassium	Not Available	5000	25	75-125	20
Metals by 6010B	Selenium	0.05	10	25	75-125	20
Metals by 6010B	Silver	0.10 (s)	10	25	75-125	20
Metals by 6010B	Thallium	0.002	10	25	75-125	20
Metals by 6010B	Vanadium	Not Available	20	25	75-125	20
Metals by 6010B	Zinc	5 (s)	10	25	75-125	20
Gross alpha by 900.0	alpha	See table A-1	1.0 piC/L	25	75-125	20
Gross beta by 900.0	beta	See table A-1	1.0 piC/L	25	75-125	20
903.1	Ra-226	See table A-1	1.0 piC/L	25	75-125	20
904.0	Ra-228	See table A-1	1.0 piC/L	25	75-125	20
Isotopic Th by HASL 300 Th-01-RCmod	Th-238, 230, 232	See table A-1	1.0 piC/L	25	75-125	20
Isotopic U by HASL 300 U-02-RC mod	U-233/234, U-235/236, U-238	See table A-1	1.0 piC/L	25	75-125	20

Key: RPD = relative percent difference; mg/L = milligrams per liter; µ/L = micrograms per Liter NA = Not Applicable  
(s) = National Secondary Drinking Water Regulation not enforceable and not an action limit for this assessment



**ATTACHMENT E:  
Laboratory Analytical Results**

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Sample#	LabMatrix	Analysis	Analyte	Result	Units	LabQualifier	MDL	MDLUnits	QCType
17T-518	GROUND WATER	SW846 3005/6010B	Aluminum	68.0	ug/L	U	68.0	ug/L	TRG
17T-518	GROUND WATER	SW846 3005/6010B	Antimony	3.00	ug/L	U	3.00	ug/L	TRG
17T-518	GROUND WATER	SW846 3005/6010B	Arsenic	81.2	ug/L		5.00	ug/L	TRG
17T-518	GROUND WATER	SW846 3005/6010B	Barium	11.8	ug/L		1.00	ug/L	TRG
17T-518	GROUND WATER	SW846 3005/6010B	Beryllium	1.00	ug/L	U	1.00	ug/L	TRG
17T-518	GROUND WATER	SW846 3005/6010B	Cadmium	1.00	ug/L	U	1.00	ug/L	TRG
17T-518	GROUND WATER	SW846 3005/6010B	Calcium	1310	ug/L		50.0	ug/L	TRG
17T-518	GROUND WATER	SW846 3005/6010B	Chromium	1.00	ug/L	U	1.00	ug/L	TRG
17T-518	GROUND WATER	SW846 3005/6010B	Cobalt	1.00	ug/L	U	1.00	ug/L	TRG
17T-518	GROUND WATER	SW846 3005/6010B	Copper	3.00	ug/L	U	3.00	ug/L	TRG
17T-518	GROUND WATER	SW846 3005/6010B	Iron	479	ug/L		30.0	ug/L	TRG
17T-518	GROUND WATER	SW846 3005/6010B	Lead	3.30	ug/L	U	3.30	ug/L	TRG
17T-518	GROUND WATER	SW846 3005/6010B	Magnesium	223	ug/L	B	85.0	ug/L	TRG
17T-518	GROUND WATER	SW846 3005/6010B	Manganese	4.88	ug/L	B	2.00	ug/L	TRG
17T-518	GROUND WATER	SW846 7470A	Mercury	0.066	ug/L	U	0.066	ug/L	TRG
17T-518	GROUND WATER	SW846 3005/6010B	Nickel	1.50	ug/L	U	1.50	ug/L	TRG
17T-518	GROUND WATER	SW846 3005/6010B	Potassium	1890	ug/L		50.0	ug/L	TRG
17T-518	GROUND WATER	SW846 3005/6010B	Selenium	5.00	ug/L	U	5.00	ug/L	TRG
17T-518	GROUND WATER	SW846 3005/6010B	Silver	1.00	ug/L	U	1.00	ug/L	TRG
17T-518	GROUND WATER	SW846 3005/6010B	Sodium	186000	ug/L		100	ug/L	TRG
17T-518	GROUND WATER	SW846 3005/6010B	Thallium	5.00	ug/L	U	5.00	ug/L	TRG
17T-518	GROUND WATER	SW846 3005/6010B	Vanadium	58	ug/L		1.00	ug/L	TRG
17T-518	GROUND WATER	SW846 3005/6010B	Zinc	157	ug/L		3.30	ug/L	TRG
17T-518	GROUND WATER	EPA 900.0/SW846 9310	ALPHA	6.58	pCi/L		4.30	pCi/L	TRG
17T-518	GROUND WATER	EPA 900.0/SW846 9310	BETA	3.48	pCi/L	U	4.41	pCi/L	TRG
17T-518	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Pct Uranium-235	0.00	percent	U		percent	TRG
17T-518	GROUND WATER	EPA 903.1 Modified	Radium-226	0.0626	pCi/L	U	0.451	pCi/L	TRG
17T-518	GROUND WATER	EPA 904.0/SW846 9320 Modified	Radium-228	1.21	pCi/L	U	2.30	pCi/L	TRG
17T-518	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Uranium-233/234	7.02	pCi/L		0.269	pCi/L	TRG
17T-518	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Uranium-235/236	0.222	pCi/L	U	0.333	pCi/L	TRG
17T-518	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Uranium-238	1.66	pCi/L		0.497	pCi/L	TRG
17T-519	GROUND WATER	SW846 3005/6010B	Aluminum	68.0	ug/L	U	68.0	ug/L	TRG
17T-519	GROUND WATER	SW846 3005/6010B	Antimony	3.00	ug/L	U	3.00	ug/L	TRG
17T-519	GROUND WATER	SW846 3005/6010B	Arsenic	5.00	ug/L	U	5.00	ug/L	TRG
17T-519	GROUND WATER	SW846 3005/6010B	Barium	81.4	ug/L		1.00	ug/L	TRG
17T-519	GROUND WATER	SW846 3005/6010B	Beryllium	1.00	ug/L	U	1.00	ug/L	TRG
17T-519	GROUND WATER	SW846 3005/6010B	Cadmium	1.00	ug/L	U	1.00	ug/L	TRG
17T-519	GROUND WATER	SW846 3005/6010B	Calcium	29000	ug/L		50.0	ug/L	TRG
17T-519	GROUND WATER	SW846 3005/6010B	Chromium	1.00	ug/L	U	1.00	ug/L	TRG
17T-519	GROUND WATER	SW846 3005/6010B	Cobalt	1.00	ug/L	U	1.00	ug/L	TRG
17T-519	GROUND WATER	SW846 3005/6010B	Copper	22.3	ug/L		3.00	ug/L	TRG
17T-519	GROUND WATER	SW846 3005/6010B	Iron	82.2	ug/L	B	30.0	ug/L	TRG

17T-519	GROUND WATER	SW846 3005/6010B	Lead	3.30	ug/L	U	3.30	ug/L	TRG
17T-519	GROUND WATER	SW846 3005/6010B	Magnesium	6520	ug/L		85.0	ug/L	TRG
17T-519	GROUND WATER	SW846 3005/6010B	Manganese	2.00	ug/L	U	2.00	ug/L	TRG
17T-519	GROUND WATER	SW846 7470A	Mercury	0.066	ug/L	U	0.066	ug/L	TRG
17T-519	GROUND WATER	SW846 3005/6010B	Nickel	1.50	ug/L	U	1.50	ug/L	TRG
17T-519	GROUND WATER	SW846 3005/6010B	Potassium	3310	ug/L		50.0	ug/L	TRG
17T-519	GROUND WATER	SW846 3005/6010B	Selenium	5.00	ug/L	U	5.00	ug/L	TRG
17T-519	GROUND WATER	SW846 3005/6010B	Silver	1.00	ug/L	U	1.00	ug/L	TRG
17T-519	GROUND WATER	SW846 3005/6010B	Sodium	33200	ug/L		100	ug/L	TRG
17T-519	GROUND WATER	SW846 3005/6010B	Thallium	5.00	ug/L	U	5.00	ug/L	TRG
17T-519	GROUND WATER	SW846 3005/6010B	Vanadium	1.00	ug/L	U	1.00	ug/L	TRG
17T-519	GROUND WATER	SW846 3005/6010B	Zinc	46.9	ug/L		3.30	ug/L	TRG
17T-519	GROUND WATER	EPA 900.0/SW846 9310	ALPHA	6.81	pCi/L		3.80	pCi/L	TRG
17T-519	GROUND WATER	EPA 900.0/SW846 9310	BETA	3.22	pCi/L	U	3.92	pCi/L	TRG
17T-519	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Pct Uranium-235	0.00	percent	U		percent	TRG
17T-519	GROUND WATER	EPA 903.1 Modified	Radium-226	3.10	pCi/L		0.446	pCi/L	TRG
17T-519	GROUND WATER	EPA 904.0/SW846 9320 Modified	Radium-228	5.09	pCi/L		2.79	pCi/L	TRG
17T-519	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Uranium-233/234	2.18	pCi/L		0.419	pCi/L	TRG
17T-519	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Uranium-235/236	0.216	pCi/L	U	0.324	pCi/L	TRG
17T-519	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Uranium-238	1.22	pCi/L		0.262	pCi/L	TRG
17T-545	GROUND WATER	SW846 3005/6010B	Aluminum	68.0	ug/L	U	68.0	ug/L	TRG
17T-545	GROUND WATER	SW846 3005/6010B	Antimony	3.00	ug/L	U	3.00	ug/L	TRG
17T-545	GROUND WATER	SW846 3005/6010B	Arsenic	26.8	ug/L	B	5.00	ug/L	TRG
17T-545	GROUND WATER	SW846 3005/6010B	Barium	4.96	ug/L	B	1.00	ug/L	TRG
17T-545	GROUND WATER	SW846 3005/6010B	Beryllium	1.00	ug/L	U	1.00	ug/L	TRG
17T-545	GROUND WATER	SW846 3005/6010B	Cadmium	1.05	ug/L	B	1.00	ug/L	TRG
17T-545	GROUND WATER	SW846 3005/6010B	Calcium	813	ug/L		50.0	ug/L	TRG
17T-545	GROUND WATER	SW846 3005/6010B	Chromium	1.48	ug/L	B	1.00	ug/L	TRG
17T-545	GROUND WATER	SW846 3005/6010B	Cobalt	1.00	ug/L	U	1.00	ug/L	TRG
17T-545	GROUND WATER	SW846 3005/6010B	Copper	9.44	ug/L	B	3.00	ug/L	TRG
17T-545	GROUND WATER	SW846 3005/6010B	Iron	161	ug/L		30.0	ug/L	TRG
17T-545	GROUND WATER	SW846 3005/6010B	Lead	4.03	ug/L	B	3.30	ug/L	TRG
17T-545	GROUND WATER	SW846 3005/6010B	Magnesium	155	ug/L	B	85.0	ug/L	TRG
17T-545	GROUND WATER	SW846 3005/6010B	Manganese	3.41	ug/L	B	2.00	ug/L	TRG
17T-545	GROUND WATER	SW846 7470A	Mercury	0.066	ug/L	U	0.066	ug/L	TRG
17T-545	GROUND WATER	SW846 3005/6010B	Nickel	1.50	ug/L	U	1.50	ug/L	TRG
17T-545	GROUND WATER	SW846 3005/6010B	Potassium	1300	ug/L		50.0	ug/L	TRG
17T-545	GROUND WATER	SW846 3005/6010B	Selenium	10.7	ug/L	B	5.00	ug/L	TRG
17T-545	GROUND WATER	SW846 3005/6010B	Silver	1.00	ug/L	U	1.00	ug/L	TRG
17T-545	GROUND WATER	SW846 3005/6010B	Sodium	175000	ug/L		100	ug/L	TRG
17T-545	GROUND WATER	SW846 3005/6010B	Thallium	5.00	ug/L	U	5.00	ug/L	TRG
17T-545	GROUND WATER	SW846 3005/6010B	Vanadium	74	ug/L		1.00	ug/L	TRG
17T-545	GROUND WATER	SW846 3005/6010B	Zinc	57.9	ug/L		3.30	ug/L	TRG



17T-545	GROUND WATER	EPA 900.0/SW846 9310	ALPHA	17.2	pCi/L		4.10	pCi/L	TRG
17T-545	GROUND WATER	EPA 900.0/SW846 9310	BETA	-0.726	pCi/L	U	3.47	pCi/L	TRG
17T-545	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Pct Uranium-235	0.00	percent	U		percent	TRG
17T-545	GROUND WATER	EPA 903.1 Modified	Radium-226	0.218	pCi/L	U	0.441	pCi/L	TRG
17T-545	GROUND WATER	EPA 904.0/SW846 9320 Modified	Radium-228	2.97	pCi/L		2.89	pCi/L	TRG
17T-545	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Uranium-233/234	16.3	pCi/L		0.646	pCi/L	TRG
17T-545	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Uranium-235/236	0.363	pCi/L	U	0.799	pCi/L	TRG
17T-545	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Uranium-238	5.60	pCi/L		0.350	pCi/L	TRG
17T-589	GROUND WATER	SW846 3005/6010B	Aluminum	194	ug/L	B	68.0	ug/L	TRG
17T-589	GROUND WATER	SW846 3005/6010B	Antimony	3.00	ug/L	U	3.00	ug/L	TRG
17T-589	GROUND WATER	SW846 3005/6010B	Arsenic	18.8	ug/L	B	5.00	ug/L	TRG
17T-589	GROUND WATER	SW846 3005/6010B	Barium	6.38	ug/L		1.00	ug/L	TRG
17T-589	GROUND WATER	SW846 3005/6010B	Beryllium	1.00	ug/L	U	1.00	ug/L	TRG
17T-589	GROUND WATER	SW846 3005/6010B	Cadmium	1.00	ug/L	U	1.00	ug/L	TRG
17T-589	GROUND WATER	SW846 3005/6010B	Calcium	7130	ug/L		50.0	ug/L	TRG
17T-589	GROUND WATER	SW846 3005/6010B	Chromium	1.00	ug/L	U	1.00	ug/L	TRG
17T-589	GROUND WATER	SW846 3005/6010B	Cobalt	1.00	ug/L	U	1.00	ug/L	TRG
17T-589	GROUND WATER	SW846 3005/6010B	Copper	10.7	ug/L		3.00	ug/L	TRG
17T-589	GROUND WATER	SW846 3005/6010B	Iron	372	ug/L		30.0	ug/L	TRG
17T-589	GROUND WATER	SW846 3005/6010B	Lead	3.30	ug/L	U	3.30	ug/L	TRG
17T-589	GROUND WATER	SW846 3005/6010B	Magnesium	2870	ug/L		85.0	ug/L	TRG
17T-589	GROUND WATER	SW846 3005/6010B	Manganese	6.11	ug/L	B	2.00	ug/L	TRG
17T-589	GROUND WATER	SW846 7470A	Mercury	0.066	ug/L	U	0.066	ug/L	TRG
17T-589	GROUND WATER	SW846 3005/6010B	Nickel	1.50	ug/L	U	1.50	ug/L	TRG
17T-589	GROUND WATER	SW846 3005/6010B	Potassium	3280	ug/L		50.0	ug/L	TRG
17T-589	GROUND WATER	SW846 3005/6010B	Selenium	5.00	ug/L	U	5.00	ug/L	TRG
17T-589	GROUND WATER	SW846 3005/6010B	Silver	1.00	ug/L	U	1.00	ug/L	TRG
17T-589	GROUND WATER	SW846 3005/6010B	Sodium	402000	ug/L		100	ug/L	TRG
17T-589	GROUND WATER	SW846 3005/6010B	Thallium	5.00	ug/L	U	5.00	ug/L	TRG
17T-589	GROUND WATER	SW846 3005/6010B	Vanadium	1.00	ug/L	U	1.00	ug/L	TRG
17T-589	GROUND WATER	SW846 3005/6010B	Zinc	72.7	ug/L		3.30	ug/L	TRG
17T-589	GROUND WATER	EPA 900.0/SW846 9310	ALPHA	0.504	pCi/L	U	4.79	pCi/L	TRG
17T-589	GROUND WATER	EPA 900.0/SW846 9310	BETA	2.42	pCi/L	U	4.25	pCi/L	TRG
17T-589	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Pct Uranium-235	0.00	percent	U		percent	TRG
17T-589	GROUND WATER	EPA 903.1 Modified	Radium-226	0.464	pCi/L		0.375	pCi/L	TRG
17T-589	GROUND WATER	EPA 904.0/SW846 9320 Modified	Radium-228	1.95	pCi/L	U	2.46	pCi/L	TRG
17T-589	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Uranium-233/234	0.754	pCi/L		0.450	pCi/L	TRG
17T-589	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Uranium-235/236	-0.0278	pCi/L	U	0.556	pCi/L	TRG
17T-589	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Uranium-238	0.0713	pCi/L	U	0.450	pCi/L	TRG

Sample#	LabMatrix	Analysis	Analyte	Result	Units	LabQualifier	MDL	MDLUnits	QCType
10-21-65 WELL17	GROUND WATER	SW846 3005/6010B	Aluminum	1430	ug/L		340	ug/L	TRG
10-21-65 WELL17	GROUND WATER	SW846 3005/6010B	Antimony	3.00	ug/L	U	3.00	ug/L	TRG
10-21-65 WELL17	GROUND WATER	SW846 3005/6010B	Arsenic	5.00	ug/L	U	5.00	ug/L	TRG
10-21-65 WELL17	GROUND WATER	SW846 3005/6010B	Barium	47.9	ug/L		1.00	ug/L	TRG
10-21-65 WELL17	GROUND WATER	SW846 3005/6010B	Beryllium	5.00	ug/L	U	5.00	ug/L	TRG
10-21-65 WELL17	GROUND WATER	SW846 3005/6010B	Cadmium	1.00	ug/L	U	1.00	ug/L	TRG
10-21-65 WELL17	GROUND WATER	SW846 3005/6010B	Calcium	541000	ug/L		250	ug/L	TRG
10-21-65 WELL17	GROUND WATER	SW846 3005/6010B	Chromium	1.00	ug/L	U	1.00	ug/L	TRG
10-21-65 WELL17	GROUND WATER	SW846 3005/6010B	Cobalt	1.54	ug/L	B	1.00	ug/L	TRG
10-21-65 WELL17	GROUND WATER	SW846 3005/6010B	Copper	5.06	ug/L	B	3.00	ug/L	TRG
10-21-65 WELL17	GROUND WATER	EPA 300.0	Fluoride	1.58	mg/L		0.330	mg/L	TRG
10-21-65 WELL17	GROUND WATER	SW846 3005/6010B	Iron	2060	ug/L		30.0	ug/L	TRG
10-21-65 WELL17	GROUND WATER	SW846 3005/6010B	Lead	16.5	ug/L	U	16.5	ug/L	TRG
10-21-65 WELL17	GROUND WATER	SW846 3005/6010B	Magnesium	266000	ug/L		85.0	ug/L	TRG
10-21-65 WELL17	GROUND WATER	SW846 3005/6010B	Manganese	68.9	ug/L		2.00	ug/L	TRG
10-21-65 WELL17	GROUND WATER	SW846 7470A	Mercury	0.066	ug/L	U	0.066	ug/L	TRG
10-21-65 WELL17	GROUND WATER	SW846 3005/6010B	Nickel	2.38	ug/L	B	1.50	ug/L	TRG
10-21-65 WELL17	GROUND WATER	SW846 3005/6010B	Potassium	9770	ug/L		250	ug/L	TRG
10-21-65 WELL17	GROUND WATER	SW846 3005/6010B	Selenium	5.00	ug/L	U	5.00	ug/L	TRG
10-21-65 WELL17	GROUND WATER	SW846 3005/6010B	Silver	5.00	ug/L	U	5.00	ug/L	TRG
10-21-65 WELL17	GROUND WATER	SW846 3005/6010B	Sodium	106000	ug/L		100	ug/L	TRG
10-21-65 WELL17	GROUND WATER	SW846 3005/6010B	Thallium	5.00	ug/L	U	5.00	ug/L	TRG
10-21-65 WELL17	GROUND WATER	SW846 3005/6010B	Vanadium	3.8	ug/L	B	1.00	ug/L	TRG
10-21-65 WELL17	GROUND WATER	SW846 3005/6010B	Zinc	12.4	ug/L		3.30	ug/L	TRG
10-21-65 WELL17	GROUND WATER	EPA 900.0/SW846 9310	ALPHA	14.5	pCi/L		4.42	pCi/L	TRG
10-21-65 WELL17	GROUND WATER	EPA 900.0/SW846 9310	BETA	11.6	pCi/L		5.73	pCi/L	TRG
10-21-65 WELL17	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Pct Uranium-235	2.05	percent			percent	TRG
10-21-65 WELL17	GROUND WATER	EPA 903.1 Modified	Radium-226	0.0842	pCi/L	U	0.202	pCi/L	TRG
10-21-65 WELL17	GROUND WATER	EPA 904.0/SW846 9320 Modified	Radium-228	2.09	pCi/L	U	2.77	pCi/L	TRG
10-21-65 WELL17	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Uranium-233/234	9.87	pCi/L		0.644	pCi/L	TRG
10-21-65 WELL17	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Uranium-235/236	0.782	pCi/L		0.391	pCi/L	TRG
10-21-65 WELL17	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Uranium-238	5.80	pCi/L		0.316	pCi/L	TRG
10-21-65 WELL17	GROUND WATER	EPA 300.0	Chloride	137	mg/L		0.660	mg/L	TRG
10-21-65 WELL17	GROUND WATER	EPA 300.0	Nitrate	0.191	mg/L		0.033	mg/L	TRG
10-21-65 WELL17	GROUND WATER	EPA 300.0	Nitrite	0.100	mg/L	U	0.033	mg/L	TRG
10-21-65 WELL17	GROUND WATER	EPA 300.0	Ortho-phosphate	0.00	mg/L	HU	0.660	mg/L	TRG
10-21-65 WELL17	GROUND WATER	EPA 300.0	Sulfate	2450	mg/L		100	mg/L	TRG
15T-529	GROUND WATER	SW846 3005/6010B	Aluminum	68.0	ug/L	U	68.0	ug/L	TRG
15T-529	GROUND WATER	SW846 3005/6010B	Antimony	3.00	ug/L	U	3.00	ug/L	TRG
15T-529	GROUND WATER	SW846 3005/6010B	Arsenic	5.00	ug/L	U	5.00	ug/L	TRG
15T-529	GROUND WATER	SW846 3005/6010B	Barium	17.6	ug/L		1.00	ug/L	TRG
15T-529	GROUND WATER	SW846 3005/6010B	Beryllium	1.00	ug/L	U	1.00	ug/L	TRG
15T-529	GROUND WATER	SW846 3005/6010B	Cadmium	1.00	ug/L	U	1.00	ug/L	TRG

15T-529	GROUND WATER	SW846 3005/6010B	Calcium	16500	ug/L		50.0	ug/L	TRG
15T-529	GROUND WATER	SW846 3005/6010B	Chromium	1.00	ug/L	U	1.00	ug/L	TRG
15T-529	GROUND WATER	SW846 3005/6010B	Cobalt	1.00	ug/L	U	1.00	ug/L	TRG
15T-529	GROUND WATER	SW846 3005/6010B	Copper	30.5	ug/L		3.00	ug/L	TRG
15T-529	GROUND WATER	SW846 3005/6010B	Iron	948	ug/L		30.0	ug/L	TRG
15T-529	GROUND WATER	SW846 3005/6010B	Lead	3.30	ug/L	U	3.30	ug/L	TRG
15T-529	GROUND WATER	SW846 3005/6010B	Magnesium	6220	ug/L		85.0	ug/L	TRG
15T-529	GROUND WATER	SW846 3005/6010B	Manganese	67.1	ug/L		2.00	ug/L	TRG
15T-529	GROUND WATER	SW846 7470A	Mercury	0.066	ug/L	U	0.066	ug/L	TRG
15T-529	GROUND WATER	SW846 3005/6010B	Nickel	1.50	ug/L	U	1.50	ug/L	TRG
15T-529	GROUND WATER	SW846 3005/6010B	Potassium	2220	ug/L		50.0	ug/L	TRG
15T-529	GROUND WATER	SW846 3005/6010B	Selenium	5.00	ug/L	U	5.00	ug/L	TRG
15T-529	GROUND WATER	SW846 3005/6010B	Silver	1.00	ug/L	U	1.00	ug/L	TRG
15T-529	GROUND WATER	SW846 3005/6010B	Sodium	217000	ug/L		100	ug/L	TRG
15T-529	GROUND WATER	SW846 3005/6010B	Thallium	5.00	ug/L	U	5.00	ug/L	TRG
15T-529	GROUND WATER	SW846 3005/6010B	Vanadium	1.00	ug/L	U	1.00	ug/L	TRG
15T-529	GROUND WATER	SW846 3005/6010B	Zinc	623	ug/L		3.30	ug/L	TRG
15T-529	GROUND WATER	EPA 900.0/SW846 9310	ALPHA	0.510	pCi/L	U	4.63	pCi/L	TRG
15T-529	GROUND WATER	EPA 900.0/SW846 9310	BETA	3.47	pCi/L	U	3.47	pCi/L	TRG
15T-529	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Pct Uranium-235	0.00	percent	U		percent	TRG
15T-529	GROUND WATER	EPA 903.1 Modified	Radium-226	0.584	pCi/L		0.224	pCi/L	TRG
15T-529	GROUND WATER	EPA 904.0/SW846 9320 Modified	Radium-228	1.46	pCi/L	U	2.43	pCi/L	TRG
15T-529	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Uranium-233/234	0.181	pCi/L	U	0.433	pCi/L	TRG
15T-529	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Uranium-235/236	-0.0268	pCi/L	U	0.535	pCi/L	TRG
15T-529	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Uranium-238	0.0686	pCi/L	U	0.433	pCi/L	TRG
15T-529100	GROUND WATER	SW846 3005/6010B	Aluminum	68.0	ug/L	U	68.0	ug/L	TRG
15T-529100	GROUND WATER	SW846 3005/6010B	Antimony	3.00	ug/L	U	3.00	ug/L	TRG
15T-529100	GROUND WATER	SW846 3005/6010B	Arsenic	5.00	ug/L	U	5.00	ug/L	TRG
15T-529100	GROUND WATER	SW846 3005/6010B	Barium	16.8	ug/L		1.00	ug/L	TRG
15T-529100	GROUND WATER	SW846 3005/6010B	Beryllium	1.00	ug/L	U	1.00	ug/L	TRG
15T-529100	GROUND WATER	SW846 3005/6010B	Cadmium	1.00	ug/L	U	1.00	ug/L	TRG
15T-529100	GROUND WATER	SW846 3005/6010B	Calcium	15900	ug/L		50.0	ug/L	TRG
15T-529100	GROUND WATER	SW846 3005/6010B	Chromium	1.00	ug/L	U	1.00	ug/L	TRG
15T-529100	GROUND WATER	SW846 3005/6010B	Cobalt	1.00	ug/L	U	1.00	ug/L	TRG
15T-529100	GROUND WATER	SW846 3005/6010B	Copper	28.1	ug/L		3.00	ug/L	TRG
15T-529100	GROUND WATER	SW846 3005/6010B	Iron	859	ug/L		30.0	ug/L	TRG
15T-529100	GROUND WATER	SW846 3005/6010B	Lead	3.30	ug/L	U	3.30	ug/L	TRG
15T-529100	GROUND WATER	SW846 3005/6010B	Magnesium	5970	ug/L		85.0	ug/L	TRG
15T-529100	GROUND WATER	SW846 3005/6010B	Manganese	64.4	ug/L		2.00	ug/L	TRG
15T-529100	GROUND WATER	SW846 7470A	Mercury	0.066	ug/L	U	0.066	ug/L	TRG
15T-529100	GROUND WATER	SW846 3005/6010B	Nickel	1.50	ug/L	U	1.50	ug/L	TRG
15T-529100	GROUND WATER	SW846 3005/6010B	Potassium	2160	ug/L		50.0	ug/L	TRG
15T-529100	GROUND WATER	SW846 3005/6010B	Selenium	5.00	ug/L	U	5.00	ug/L	TRG
15T-529100	GROUND WATER	SW846 3005/6010B	Silver	1.00	ug/L	U	1.00	ug/L	TRG

15T-529100	GROUND WATER	SW846 3005/6010B	Sodium	212000	ug/L		100	ug/L	TRG
15T-529100	GROUND WATER	SW846 3005/6010B	Thallium	5.00	ug/L	U	5.00	ug/L	TRG
15T-529100	GROUND WATER	SW846 3005/6010B	Vanadium	1.00	ug/L	U	1.00	ug/L	TRG
15T-529100	GROUND WATER	SW846 3005/6010B	Zinc	591	ug/L		3.30	ug/L	TRG
15T-529100	GROUND WATER	EPA 900.0/SW846 9310	ALPHA	0.849	pCi/L	U	4.73	pCi/L	TRG
15T-529100	GROUND WATER	EPA 900.0/SW846 9310	BETA	4.21	pCi/L		2.97	pCi/L	TRG
15T-529100	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Pct Uranium-235	0.00	percent	U		percent	TRG
15T-529100	GROUND WATER	EPA 903.1 Modified	Radium-226	0.737	pCi/L		0.272	pCi/L	TRG
15T-529100	GROUND WATER	EPA 904.0/SW846 9320 Modified	Radium-228	1.70	pCi/L	U	2.96	pCi/L	TRG
15T-529100	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Uranium-233/234	0.0414	pCi/L	U	0.521	pCi/L	TRG
15T-529100	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Uranium-235/236	0.105	pCi/L	U	0.316	pCi/L	TRG
15T-529100	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Uranium-238	0.0853	pCi/L	U	0.256	pCi/L	TRG
16-4-16	GROUND WATER	SW846 3005/6010B	Aluminum	87.7	ug/L	B	68.0	ug/L	TRG
16-4-16	GROUND WATER	SW846 3005/6010B	Antimony	3.6	ug/L	B	3.00	ug/L	TRG
16-4-16	GROUND WATER	SW846 3005/6010B	Arsenic	5.00	ug/L	U	5.00	ug/L	TRG
16-4-16	GROUND WATER	SW846 3005/6010B	Barium	199	ug/L		1.00	ug/L	TRG
16-4-16	GROUND WATER	SW846 3005/6010B	Beryllium	1.00	ug/L	U	1.00	ug/L	TRG
16-4-16	GROUND WATER	SW846 3005/6010B	Cadmium	1.00	ug/L	U	1.00	ug/L	TRG
16-4-16	GROUND WATER	SW846 3005/6010B	Calcium	16500	ug/L		50.0	ug/L	TRG
16-4-16	GROUND WATER	SW846 3005/6010B	Chromium	1.00	ug/L	U	1.00	ug/L	TRG
16-4-16	GROUND WATER	SW846 3005/6010B	Cobalt	1.00	ug/L	U	1.00	ug/L	TRG
16-4-16	GROUND WATER	SW846 3005/6010B	Copper	3.00	ug/L	U	3.00	ug/L	TRG
16-4-16	GROUND WATER	EPA 300.0	Fluoride	0.680	mg/L		0.033	mg/L	TRG
16-4-16	GROUND WATER	SW846 3005/6010B	Iron	48	ug/L	B	30.0	ug/L	TRG
16-4-16	GROUND WATER	SW846 3005/6010B	Lead	3.30	ug/L	U	3.30	ug/L	TRG
16-4-16	GROUND WATER	SW846 3005/6010B	Magnesium	5060	ug/L		85.0	ug/L	TRG
16-4-16	GROUND WATER	SW846 3005/6010B	Manganese	4.69	ug/L	B	2.00	ug/L	TRG
16-4-16	GROUND WATER	SW846 7470A	Mercury	0.066	ug/L	U	0.066	ug/L	TRG
16-4-16	GROUND WATER	SW846 3005/6010B	Nickel	1.50	ug/L	U	1.50	ug/L	TRG
16-4-16	GROUND WATER	SW846 3005/6010B	Potassium	1450	ug/L		50.0	ug/L	TRG
16-4-16	GROUND WATER	SW846 3005/6010B	Selenium	5.00	ug/L	U	5.00	ug/L	TRG
16-4-16	GROUND WATER	SW846 3005/6010B	Silver	1.00	ug/L	U	1.00	ug/L	TRG
16-4-16	GROUND WATER	SW846 3005/6010B	Sodium	116000	ug/L		100	ug/L	TRG
16-4-16	GROUND WATER	SW846 3005/6010B	Thallium	5.00	ug/L	U	5.00	ug/L	TRG
16-4-16	GROUND WATER	SW846 3005/6010B	Vanadium	30.5	ug/L		1.00	ug/L	TRG
16-4-16	GROUND WATER	SW846 3005/6010B	Zinc	5.78	ug/L	B	3.30	ug/L	TRG
16-4-16	GROUND WATER	EPA 900.0/SW846 9310	ALPHA	10.8	pCi/L		4.66	pCi/L	TRG
16-4-16	GROUND WATER	EPA 900.0/SW846 9310	BETA	1.65	pCi/L	U	3.51	pCi/L	TRG
16-4-16	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Pct Uranium-235	0.00	percent	U		percent	TRG
16-4-16	GROUND WATER	EPA 903.1 Modified	Radium-226	1.66	pCi/L		0.218	pCi/L	TRG
16-4-16	GROUND WATER	EPA 904.0/SW846 9320 Modified	Radium-228	0.987	pCi/L	U	2.66	pCi/L	TRG
16-4-16	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Uranium-233/234	6.64	pCi/L		0.512	pCi/L	TRG
16-4-16	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Uranium-235/236	0.114	pCi/L	U	0.343	pCi/L	TRG
16-4-16	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Uranium-238	3.72	pCi/L		0.565	pCi/L	TRG

16-4-16	GROUND WATER	EPA 300.0	Chloride	11.5	mg/L		0.066	mg/L	TRG
16-4-16	GROUND WATER	EPA 300.0	Nitrate	1.31	mg/L		0.033	mg/L	TRG
16-4-16	GROUND WATER	EPA 300.0	Nitrite	0.100	mg/L	U	0.033	mg/L	TRG
16-4-16	GROUND WATER	EPA 300.0	Ortho-phosphate	0.200	mg/L	U	0.066	mg/L	TRG
16-4-16	GROUND WATER	EPA 300.0	Sulfate	21.4	mg/L		0.100	mg/L	TRG
PIGEON SPRINGS	GROUND WATER	SW846 3005/6010B	Aluminum	104	ug/L	B	68.0	ug/L	TRG
PIGEON SPRINGS	GROUND WATER	SW846 3005/6010B	Antimony	3.00	ug/L	U	3.00	ug/L	TRG
PIGEON SPRINGS	GROUND WATER	SW846 3005/6010B	Arsenic	5.00	ug/L	U	5.00	ug/L	TRG
PIGEON SPRINGS	GROUND WATER	SW846 3005/6010B	Barium	60.8	ug/L		1.00	ug/L	TRG
PIGEON SPRINGS	GROUND WATER	SW846 3005/6010B	Beryllium	1.00	ug/L	U	1.00	ug/L	TRG
PIGEON SPRINGS	GROUND WATER	SW846 3005/6010B	Cadmium	1.00	ug/L	U	1.00	ug/L	TRG
PIGEON SPRINGS	GROUND WATER	SW846 3005/6010B	Calcium	5140	ug/L		50.0	ug/L	TRG
PIGEON SPRINGS	GROUND WATER	SW846 3005/6010B	Chromium	1.00	ug/L	U	1.00	ug/L	TRG
PIGEON SPRINGS	GROUND WATER	SW846 3005/6010B	Cobalt	1.00	ug/L	U	1.00	ug/L	TRG
PIGEON SPRINGS	GROUND WATER	SW846 3005/6010B	Copper	67.3	ug/L		3.00	ug/L	TRG
PIGEON SPRINGS	GROUND WATER	SW846 3005/6010B	Iron	154	ug/L		30.0	ug/L	TRG
PIGEON SPRINGS	GROUND WATER	SW846 3005/6010B	Lead	3.73	ug/L	B	3.30	ug/L	TRG
PIGEON SPRINGS	GROUND WATER	SW846 3005/6010B	Magnesium	1520	ug/L		85.0	ug/L	TRG
PIGEON SPRINGS	GROUND WATER	SW846 3005/6010B	Manganese	3.26	ug/L	B	2.00	ug/L	TRG
PIGEON SPRINGS	GROUND WATER	SW846 7470A	Mercury	0.066	ug/L	U	0.066	ug/L	TRG
PIGEON SPRINGS	GROUND WATER	SW846 3005/6010B	Nickel	1.50	ug/L	U	1.50	ug/L	TRG
PIGEON SPRINGS	GROUND WATER	SW846 3005/6010B	Potassium	2960	ug/L		50.0	ug/L	TRG
PIGEON SPRINGS	GROUND WATER	SW846 3005/6010B	Selenium	5.00	ug/L	U	5.00	ug/L	TRG
PIGEON SPRINGS	GROUND WATER	SW846 3005/6010B	Silver	1.00	ug/L	U	1.00	ug/L	TRG
PIGEON SPRINGS	GROUND WATER	SW846 3005/6010B	Sodium	272000	ug/L		100	ug/L	TRG
PIGEON SPRINGS	GROUND WATER	SW846 3005/6010B	Thallium	5.00	ug/L	U	5.00	ug/L	TRG
PIGEON SPRINGS	GROUND WATER	SW846 3005/6010B	Vanadium	57.1	ug/L		1.00	ug/L	TRG
PIGEON SPRINGS	GROUND WATER	SW846 3005/6010B	Zinc	55.8	ug/L		3.30	ug/L	TRG
PIGEON SPRINGS	GROUND WATER	EPA 900.0/SW846 9310	ALPHA	14.4	pCi/L		4.81	pCi/L	TRG
PIGEON SPRINGS	GROUND WATER	EPA 900.0/SW846 9310	BETA	8.74	pCi/L		3.12	pCi/L	TRG
PIGEON SPRINGS	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Pct Uranium-235	0.725	percent			percent	TRG
PIGEON SPRINGS	GROUND WATER	EPA 903.1 Modified	Radium-226	0.447	pCi/L		0.268	pCi/L	TRG
PIGEON SPRINGS	GROUND WATER	EPA 904.0/SW846 9320 Modified	Radium-228	3.55	pCi/L		2.47	pCi/L	TRG
PIGEON SPRINGS	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Uranium-233/234	38.7	pCi/L		0.285	pCi/L	TRG
PIGEON SPRINGS	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Uranium-235/236	0.911	pCi/L		0.563	pCi/L	TRG
PIGEON SPRINGS	GROUND WATER	DOE EML HASL-300, U-02-RC Modified	Uranium-238	19.4	pCi/L		0.285	pCi/L	TRG

Notes:

B = Analyte found in the associated blank, as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

HU = Not Detected and the analyte in question was quantitated using peak heights rather than peak areas for both the analyte and its internal standard.

U = Not Detected

J = Estimated Value