

**Old Church Rock Mine
Eastern Abandoned Uranium Mine Region**

**OCRM Removal Assessment
Appendix I
Volumetric Estimates**

Response, Assessment, and Evaluation Services

Contract No. EP-S9-17-03

Task Order 0035

Date

August 25, 2023

Submitted to

U.S. Environmental Protection Agency

Submitted by

Tetra Tech, Inc.

1999 Harrison Street, Suite 500

Oakland, CA 94612



TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
ACRONYMS AND ABBREVIATIONS	I-iii
1.0 INTRODUCTION	I-1
2.0 SETTLING POND ESTIMATES.....	I-2
2.1 CALCULATION METHODOLOGY	I-2
2.2 POND ESTIMATES.....	I-6
3.0 CONCRETE SLAB ESTIMATES	I-9
4.0 TIME-CRITICAL REMOVAL ACTION VOLUMES.....	I-11
4.1 2013 INVESTIGATION RESULTS	I-11
4.2 CORRELATING 2013 RAW MEASUREMENTS WITH REMOVAL ASSESSMENT GAMMA-RADIUM CORRELATION	I-11
4.3 WASTE REMOVAL VOLUME ESTIMATES.....	I-19
5.0 REFERENCES	I-28

FIGURES

Figure I-1. Old Church Rock Mine AUM and AUM – Related Features.....	I-3
Figure I-2. Settling Pond Cross Section.....	I-4
Figure I-3. Old Church Rock Mine Areas of Concern.....	I-20
Figure I-4. Old Church Rock Mine Estimated Depth of Radium-226 Contamination at 2 pCi/g	I-21
Figure I-5. Old Church Rock Mine Estimated Depth of Radium-226 Contamination at 5 pCi/g	I-22
Figure I-6. Old Church Rock Mine Estimated Depth of Radium-226 Contamination at 10 pCi/g	I-23
Figure I-7. Old Church Rock Mine Estimated Depth of Radium-226 Contamination at 15 pCi/g	I-24
Figure I-8. Old Church Rock Mine Estimated Depth of Radium-226 Contamination at 25 pCi/g	I-25



TABLES

Table I-1. Estimation of Former Settling Pond Volumes	I-7
Table I-2. Summary of Volume Estimates of Settling Ponds.....	I-8
Table I-3. Estimates of Concrete Slab Volumes.....	I-10
Table I-4. 2013 Downhole Gamma Surface Measurements with Co-Located 2022 Removal Assessment Gamma Survey Measurements.....	I-12
Table I-5. 2013 Downhole Gamma Equivalents to Ra-226 Concentrations (Estimated).....	I-14
Table I-6. Estimated Maximum Depths of Various Ra-226 Concentrations.....	I-15
Table I-7. Area of Concern Volume Estimates.....	I-26

ATTACHMENTS

Attachment I-1: HRI Letter
Attachment I-2: 2013 Intera Investigation Soil Boring Locations
Attachment I-3: 2013 Intera Investigation Soil Boring Logs



ACRONYMS AND ABBREVIATIONS

AUM	Abandoned uranium mine
bgs	Below ground surface
cpm	Counts per minute
CY	Cubic yard
HRI	HydroResources, Inc.
IDW	Inverse distance weight
OCRM	Old Church Rock Mine
pCi/g	Picocuries per gram
R ²	Coefficient of determination
SF	Square foot
TCRA	Time-critical removal action
USEPA	United States Environmental Protection Agency



1.0 INTRODUCTION

This Appendix I to the Old Church Rock Mine (OCRM) removal assessment report presents methodology and estimates related to a future cleanup at OCRM, including volumes of former settling ponds and concrete slabs, and areas subject to cleanup in the event of a Time-Critical Removal Action (TCRA).

2.0 SETTLING POND ESTIMATES

Five former settling ponds are on site at OCRM, as identified on [Figure I-1](#). Because these ponds are potential temporary repositories for waste, calculation of the air volume in each pond is necessary.

2.1 CALCULATION METHODOLOGY

To estimate the airspace volume of each settling pond, dimensions of each pond were obtained from a letter from HydroResources, Inc. (HRI) to the New Mexico Energy, Minerals, and Natural Resources Department (HRI 1996). This letter with pond dimensions is in [Attachment I-1](#).

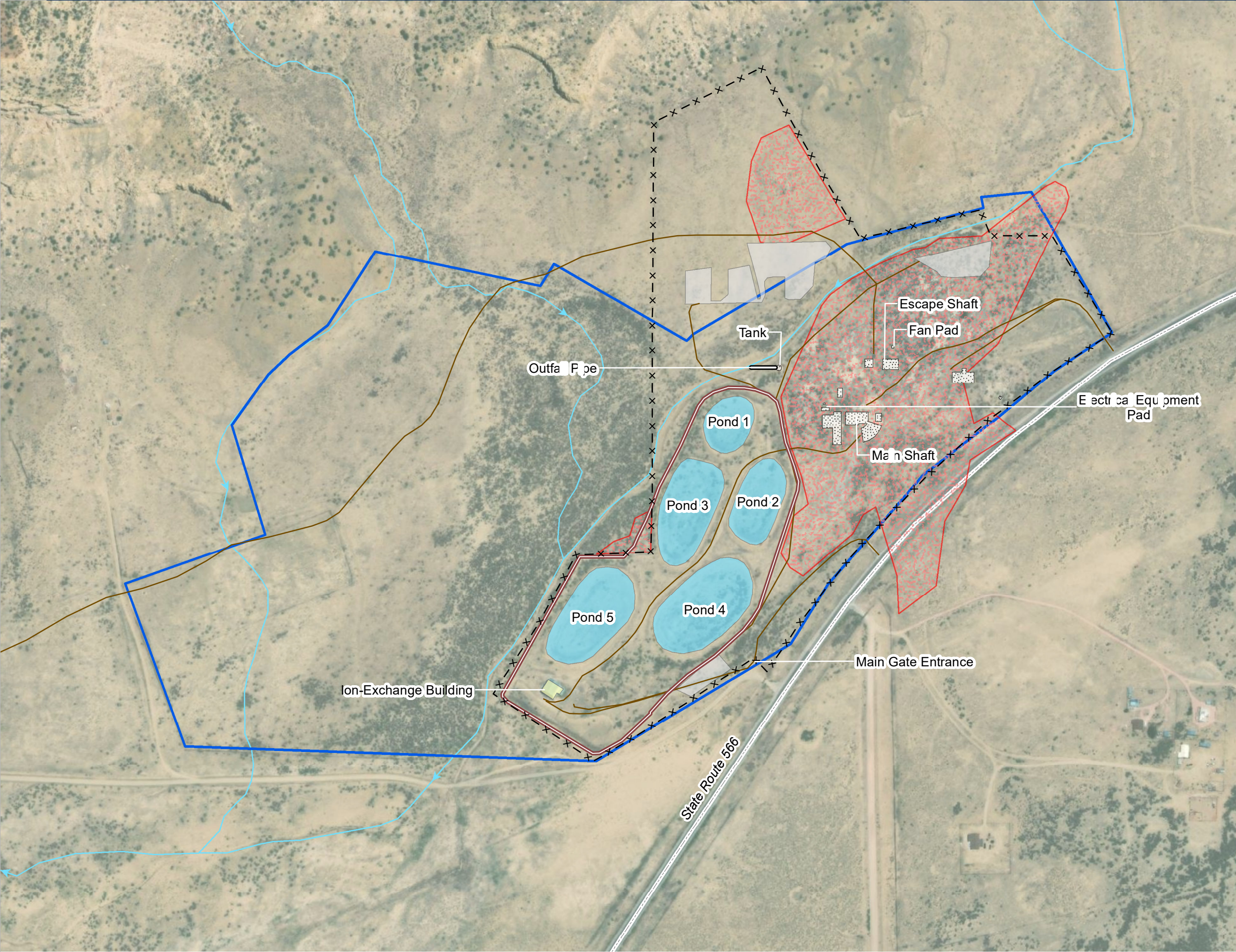
For the airspace volume calculation of each settling pond, the following dimensions were taken from [Attachment I-1](#):

H:	Average height from the base of the pond to top of the berm around the settling pond
SL _{N,E,S,W} :	Length of berm slope in four cardinal directions
PB _{NS,EW} :	Length of pond bed across two opposite cardinal directions (N-S, E-W)

From the dimensions in [Attachment I-1](#), the following features were calculated for each pond:

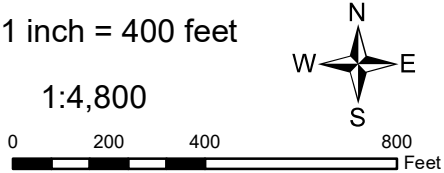
SB _{N,E,S,W}	Length of the base formed by the berm slope in four cardinal directions
B _{NS,EW}	Total length of the base between berm edges in opposite cardinal directions
A _{PB}	Pond bed area
A _T	Total area
V _S	Soil volume of the berm
V _T	Total airspace volume of the settling pond and the soil volume of the berm
V	Airspace Volume of the settling pond

[Figure I-2](#) shows a north-south (NS) cross section, east-west (EW) cross section, and overhead view of an example settling pond with the above-defined dimensions identified.



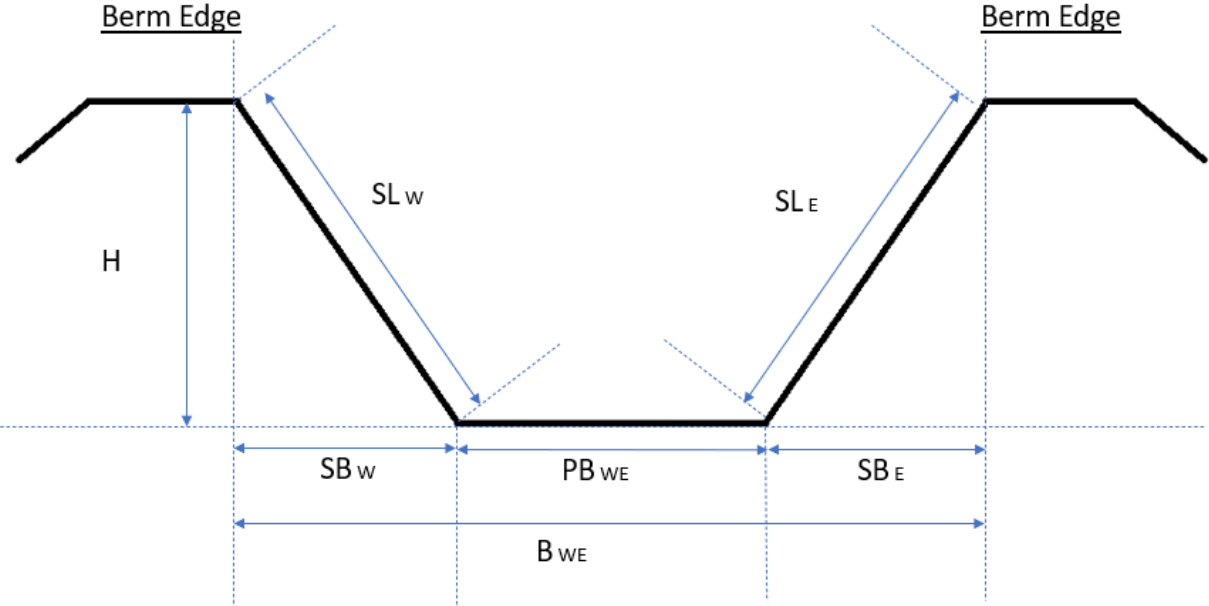
- AUM Site Boundary
- Site Features**
- Berm
 - Fenced Boundary
 - Outfall Pipe
 - Facility Road
 - Concrete Pad
 - Former Pond
 - Ion-Exchange Building
 - Surface Soil Stripping Area (2022)
 - Approximate Waste Disposal Area
 - Community Road
 - Surface Water Pathway¹

Notes:
¹All surface water pathways drain to the
Puerco River.
AUM = Abandoned uranium mine

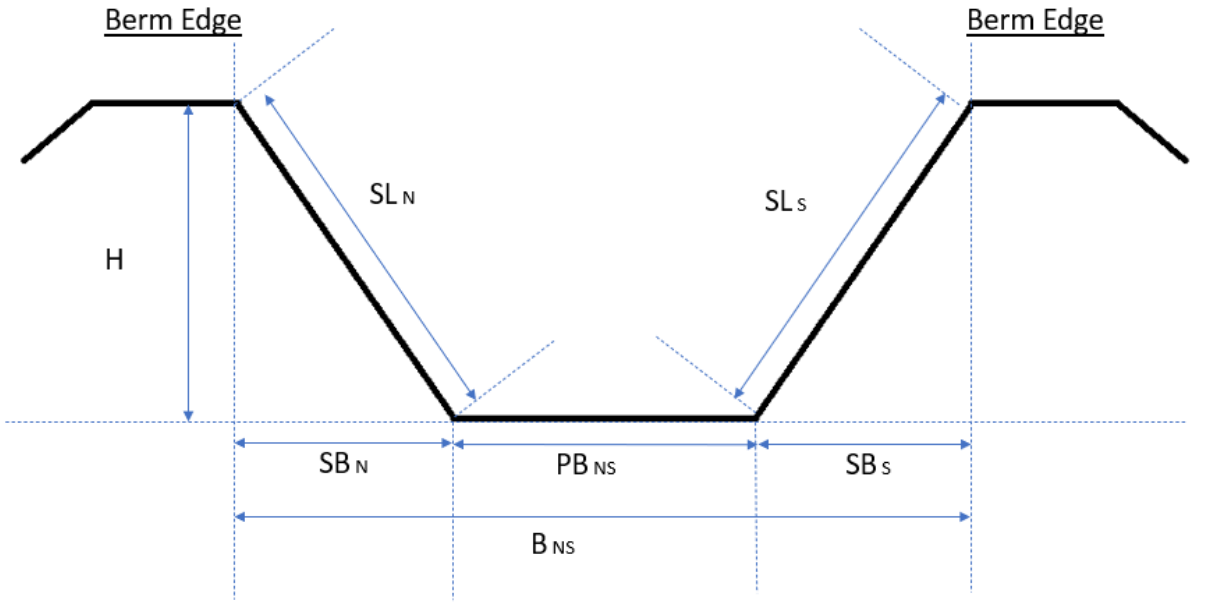


**OLD CHURCH ROCK MINE AUM
AND AUM-RELATED FEATURES**

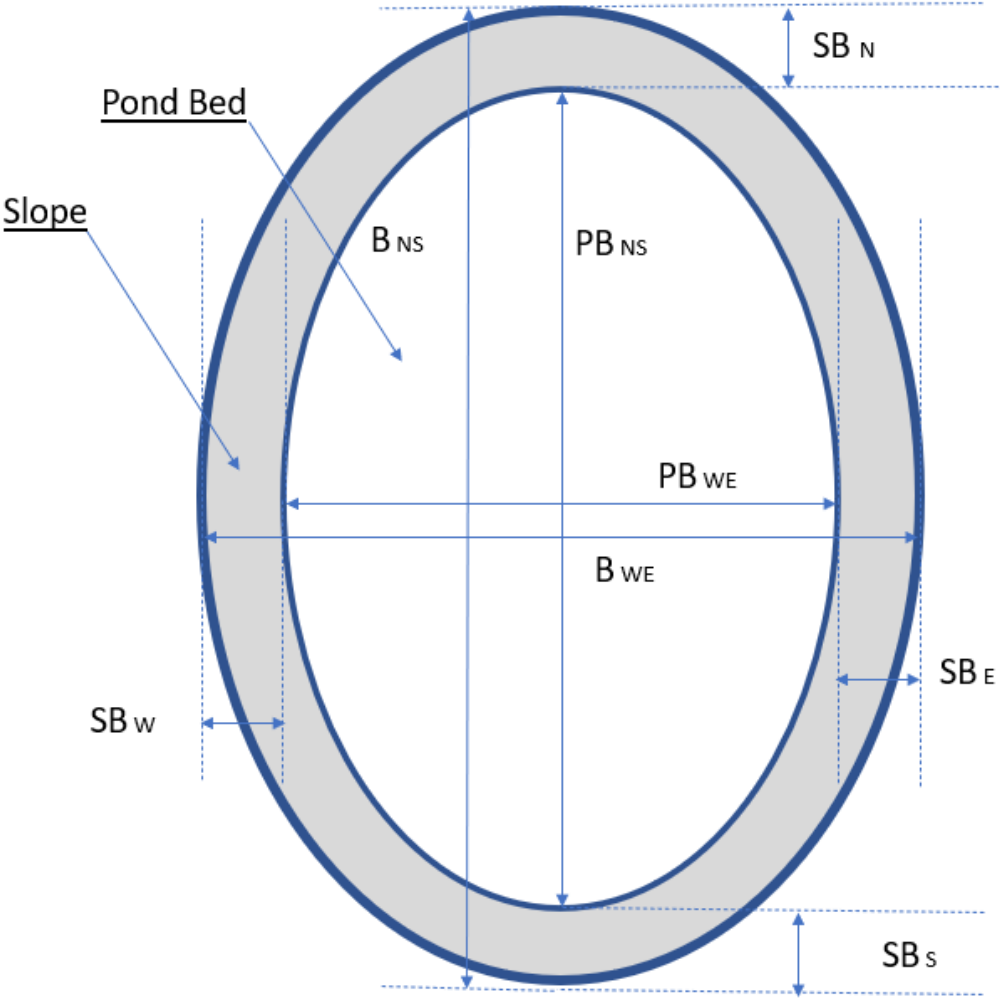
Prepared For: U.S. EPA Region 9		Prepared By:	
		TETRA TECH	
Task Order No.: 0035		Contract No.: EP-S9-17-03	
Location: CHURCH ROCK CHAPTER NAVAJO NATION		Date: 4/4/2023	
Coordinate System: NAD 1983 State Plane New Mexico West FIPS 3003 Feet Transverse			Figure No.: I-1



Settling Pond Cross Section View - EW



Settling Pond Cross Section View - NS



Settling Pond Overhead View

Figure I-2. Settling Pond Cross Section

The length of the slope base (SB_x) is calculated by the Pythagorean relationship between the length of the slope and the height of the berm above the bottom of the pond, as in Equation (Eqn)-I1:

$$SB_{N,E,S,W} = \sqrt{SL_{N,E,S,W}^2 \cdot H_{N,E,S,W}^2} \quad \text{Eqn-I1}$$

Total length of the pond is calculated by summing the pond bottom plus the two opposite slope base lengths, calculated in Eqn-I1, as in Eqn-I2:

$$B_{NS,EW} = PB_{NS,EW} + SB_{N,E} + SB_{S,W} \quad \text{Eqn-I2}$$

Area of the pond bed and total area of the settling pond, including the area of the berm, are calculated by approximating them as ellipses, as indicated in Eqn-I3 and Eqn-I4, respectively:

$$A_{PB} = \pi \cdot \frac{PB_{NS}}{2} \cdot \frac{PB_{EW}}{2} \quad \text{Eqn-I3}$$

$$A_T = \pi \cdot \frac{B_{NS}}{2} \cdot \frac{B_{EW}}{2} \quad \text{Eqn-I4}$$

Soil volume of the berm is calculated by multiplying the difference between the total settling pond area and the pond bed area by the average berm height, giving the volume of the airspace above the berm slope and the soil volume of the berm. The berm is approximated as a right triangle, and so volume of the berm and the airspace above the berm slope is then divided by 2, giving the soil volume of the berm as indicated in Eqn-I5:

$$V_S = H \cdot \frac{A_T - A_{PB}}{2} \quad \text{Eqn-I5}$$

Total volume of the settling pond includes total airspace of the settling pond and soil volume of the berm, and is calculated as the product of the total settling pond area and the average berm height of the pond, as indicated in Eqn-I6:

$$V_T = H \cdot A_T \quad \text{Eqn I6}$$

The airspace volume of the settling pond then can be calculated as the difference between total volume of the settling pond and soil volume of the berm, as indicated in Eqn-I7:

$$V = V_T - V_S \quad \text{Eqn-I7}$$

2.2 POND ESTIMATES

Applying the methodology described in [Section 2.1](#), volumetric capacity of each of the former settling ponds at OCRM was calculated. [Table I-1](#) provides those calculations (using Eqn-I1 through Eqn-I7) of the unoccupied volume in each settling pond. [Table I-2](#) lists the volume of each pond along with total volume of all five.



Table I-1. Estimation of Former Settling Pond Volumes

	Slope	Height (feet)	Slope Length (feet)	Pond Bed Length (feet)	Slope Base (feet)	Total Base Length (feet)	Pond Bed Area (feet²)	Total Area (feet²)	Slope Volume (feet³)	Total Volume (feet³)	Volume of Pond (feet³)	Volume of Pond (CY)
Pond 1	North	15	50	160	50	250	15,080	38,681	177,009	580,213	403,204	14,933
	South		40		40							
	West		45	120	45	197						
	East		32		32							
Pond 2	North	12	40	290	40	365	22,777	51,601	172,945	619,208	446,263	16,528
	South		35		35							
	West		40	100	40	180						
	East		40		40							
Pond 3	North	12	45	320	45	397	32,673	63,296	183,741	759,552	575,812	21,326
	South		32		32							
	West		40	130	40	203						
	East		33		33							
Pond 4	North	9	25	320	25	380	50,265	75,508	113,592	679,574	565,981	20,962
	South		35		35							
	West		25	200	25	253						
	East		28		28							
Pond 5	North	10	40	320	40	385	35,186	60,476	126,449	604,757	478,307	17,715
	South		25		25							
	West		30	140	30	200						
	East		30		30							
Reference:		Attachment I-1	Attachment I-1	Attachment I-1	Eqn-I1	Eqn-I2	Eqn-I3	Eqn-I4	Eqn-I5	Eqn-I6	Eqn-I7	Eqn-I7*

Note:
CY Cubic yard

Table I-2. Summary of Volume Estimates of Settling Ponds

Settling Pond	Volume Estimate (CY)
Pond 1	14,372
Pond 2	16,172
Pond 3	20,658
Pond 4	20,230
Pond 5	17,044
Total	88,475

Note:

CY Cubic yard

3.0 CONCRETE SLAB ESTIMATES

In the fenced area of OCRM within the area of former conventional mine operations, a number of concrete slabs remain. This section estimates the volume of each concrete slab based on dimensions of each concrete slab obtained from a letter from HRI to the New Mexico Energy, Minerals, and Natural Resources Department (HRI 1996). This letter with the concrete dimensions is in [Attachment I-1](#).

[Table I-3](#) provides calculations for estimating each concrete slab's volume by subdividing each slab into smaller rectangular slabs, each of known length, width, and height. Regarding concrete slab dimensions not conveyed in the HRI letter, the area of the slab was estimated by use of Google Earth, and thickness of the concrete slab was assumed to be 0.5 feet thick which is the most common thickness of slab with a known thicknesses.



Table I-3. Estimates of Concrete Slab Volumes

Slab Area	Concrete Slab	Area and Volume Calculations							Notes
		Length (feet)	Width (feet)	Area (feet ²)	Area (SY)	Thickness (feet)	Volume (feet ³)	Volume (CY)	
Main Shaft Slabs	Main Shaft Collar Section 1 Slab	55	55	3,025	336	2.0	6,050	224.1	
	Main Shaft Collar Section 2 Slab	42	55	2,310	257	2.0	4,620	171.1	
	Unnamed Adjacent Slab 1	-	-	6,390	710	0.5	3,195	118.3	Not included in HRI Calculations. Forms a semi-circle extending from between the main shaft and the main shaft hoist slabs. Area calculations are taken from Google Earth, and thickness is assumed to be 0.5 feet.
	Unnamed Adjacent Slab 2	2	3	6	1	0.5	3	0.1	Not included in HRI Calculations. Located 26 feet south of Main Shaft. Area calculations are taken from Google Earth, and thickness is assumed to be 0.5 feet.
	Main Shaft Hoist Slab	30	24	720	80	0.5	360	13.3	
	Main Shaft Hoist Foundation 1	16	32	512	57	4.0	2,048	75.9	
	Main Shaft Hoist Foundation 2	10	20	200	22	3.0	600	22.2	
Switch Gear Slabs	Unnamed Easternmost Slab Section 1	42	95	3,990	443	0.5	1,995	73.9	
	Unnamed Easternmost Slab Section 2	20	16	320	36	0.5	160	5.9	
	Unnamed Adjacent Slab	12	12	144	16	0.5	72	2.7	
	Switchgear Slab 1	7	9	63	7	0.5	32	1.2	
	Switchgear Slab 2	8	10	80	9	0.5	40	1.5	
Escape Shaft Slabs	Escape Shaft Collar Slab	68	42	2,856	317	2.0	5,712	211.6	
	Escape Shaft Hoist Slab	35	36	1,260	140	0.5	630	23.3	
	Fan Slab	10	12	120	13	0.5	60	2.2	
	Headframe Slabs 1	38	3	114	13	4.0	456	16.9	
	Headframe Slabs 2	38	3	114	13	4.0	456	16.9	
	Unnamed Hoist Slab 1	45	4	180	20	0.5	90	3.3	
	Unnamed Hoist Slab 2	16	35	560	62	2.5	1,400	51.9	
Electrical Equipment Slabs	Main Electrical Equipment Slab Section 1	60	45	2,700	300	0.5	1,350	50.0	
	Main Electrical Equipment Slab Section 2	35	140	4,900	544	0.5	2,450	90.7	
	Main Electrical Equipment Slab Section 3	10	20	200	22	0.5	100	3.7	
	Main Electrical Equipment Slab Section 4	5	20	100	11	0.5	50	1.9	
	Adjacent Electric Substation Slab Section 1	16	35	560	62	0.5	280	10.4	
	Adjacent Electric Substation Slab Section 2	3	3	9	1	0.5	5	0.2	
	Adjacent Electric Substation Slab Section 3	3	3	9	1	0.5	5	0.2	
	Unnamed Adjacent Slab 1	10	8	80	9	0.5	40	1.5	
	Unnamed Adjacent Slab 2	40	24	960	107	0.5	480	17.8	
Water Tank Slabs	Water Tank Circular Slab	-	-	452	50	0.5	226	8.4	Not included in HRI Calculations. Located next to unnamed arroyo. Area calculations are taken from Google Earth, and thickness is assumed to be 0.5 feet.
	Unnamed Adjacent Slab	5	21	105	12	0.5	53	1.9	Not included in HRI Calculations. Located 26 feet south of Main Shaft. Area calculations are taken from Google Earth and thickness is assumed to be 0.5 feet.

Notes:
- Not applicable
CY Cubic yard
HRI HydroResources, Inc.
SY Square yard

4.0 TIME-CRITICAL REMOVAL ACTION VOLUMES

Four areas of interest have been identified for cleanup within the scope of the TCRA. While no subsurface investigation occurred during the removal assessment in November 2022, the company Intera conducted a subsurface investigation in 2013 and drafted a report conveying their results in a document titled “DRAFT 2013 Phase II Site Characterization Report Old Church Rock Mine McKinley County, New Mexico” (Intera 2013).

This section proceeds through the process of digitizing raw results from the 2013 Draft report from Intera, correlating Intera’s raw results with the gamma-radium correlation included in Appendix E, and then assessing the four areas of interest for preliminary TCRA volume estimates.

The 2013 Draft Investigation report is a draft report. No interpretations or calculations in the draft report will be used for volume estimates in this appendix—only raw measurements by field instruments. Accuracy of instruments used in the investigation cannot be verified, so any and all volumes derived in this section are just estimates.

4.1 2013 INVESTIGATION RESULTS

The 2013 Draft Investigation report identifies 97 borings completed across OCRM and the surrounding area. Figure 5 of the 2013 Draft Investigation report ([Attachment I-2](#)) shows locations of all borings. At each borehole, a downhole gamma scan was completed, and a soil boring log from there included counts per minute (cpm) and associated depth (feet).

4.2 CORRELATING 2013 RAW MEASUREMENTS WITH REMOVAL ASSESSMENT GAMMA-RADIUM CORRELATION

Of the 97 borings completed during the 2013 investigation, 50 were in areas scanned during the 2022 Removal Assessment. The surface gamma reading of the downhole gamma survey at each boring was extracted from the soil boring log, included as [Attachment I-3](#), and matched with a gamma survey measurement from the 2022 removal assessment that was co-located with the 2013 downhole gamma survey surface reading. [Table I-4](#) lists each 2013 downhole gamma survey surface reading with its co-located 2022 removal assessment gamma survey measurement, as well as the corresponding gamma-radium equivalent calculated by application of Model 1 and Model 2 from Appendix E to this removal assessment report.

Table I-4. 2013 Downhole Gamma Surface Measurements with Co-Located 2022 Removal Assessment Gamma Survey Measurements

Soil Boring ID	Intera Raw Gamma (cpm)	Tetra Tech Co-Located Raw Gamma (cpm)	Tetra Tech Estimated Ra-226 – Model 1 (pCi/g)	Tetra Tech Estimated Ra-226 – Model 2 (pCi/g)
SB-18	1,922	11,801	-0.54	1.10
SB-19	1,686	12,007	-0.42	1.18
SB-102	1,700	12,069	-0.38	1.20
SB-103	1,723	12,365	-0.19	1.30
SB-10	1,647	12,402	-0.17	1.32
SB-3	1,909	12,783	0.07	1.46
SB-12	1,694	12,982	0.20	1.53
SB-2	1,623	13,301	0.40	1.64
SB-42	2,581	13,323	0.41	1.65
SB-5	2,101	14,281	1.01	1.99
SB-55	2,408	14,282	1.02	1.99
SB-28	1,573	14,419	1.10	2.04
SB-72	1,914	14,623	1.23	2.12
SB-6	1,776	14,700	1.28	2.14
SB-47	2,314	14,716	1.29	2.15
SB-26	2,041	14,759	1.32	2.16
SB-86	2,177	14,776	1.33	2.17
SB-27	2,308	14,795	1.34	2.18
SB-32	2,094	14,960	1.44	2.24
SB-39	2,443	14,970	1.45	2.24
SB-79	2,138	15,074	1.51	2.28
SB-22	2,011	15,202	1.59	2.32
SB-65	2,431	15,532	1.80	2.44
SB-49	2,434	15,574	1.83	2.46
SB-64	1,809	15,665	1.89	2.49
SB-24	2,407	15,966	2.07	2.60
SB-30	2,344	16,061	2.13	2.63
SB-20	2,195	16,262	2.26	2.70
SB-25	2,734	16,351	2.32	2.74
SB-81	2,437	16,381	2.34	2.75
SB-4	2,266	16,455	2.38	2.77
SB-21	3,082	17,284	2.90	3.07
SB-80	2,362	17,549	3.07	3.17
SB-35	2,196	17,887	3.28	3.29
SB-58	2,541	18,651	3.76	3.56
SB-85	2,323	18,933	3.94	3.66

Table I-4. 2013 Downhole Gamma Surface Measurements with Co-Located 2022 Removal Assessment Gamma Survey Measurements

Soil Boring ID	Intera Raw Gamma (cpm)	Tetra Tech Co-Located Raw Gamma (cpm)	Tetra Tech Estimated Ra-226 – Model 1 (pCi/g)	Tetra Tech Estimated Ra-226 – Model 2 (pCi/g)
SB-73	2,590	19,550	4.33	3.88
SB-74	2,760	19,557	4.33	3.89
SB-71	2,301	20,063	4.65	4.07
SB-78	2,501	21,621	5.63	4.63
SB-31	2,289	21,715	5.69	4.66
SB-91	2,697	21,917	5.82	4.73
SB-50	2,998	22,791	6.37	5.05
SB-63	2,904	24,442	7.41	5.64
SB-36	3,647	29,125	10.35	7.32
SB-75	3,217	29,512	10.60	7.46
SB-67	3,695	31,809	12.04	8.29
SB-46	3,396	33,909	13.36	9.04
SB-59	3,425	34,780	13.91	9.35
SB-54	3,515	36,915	15.25	10.12

Notes:

cpm Counts per minute
pCi/g Picocurie per gram
Ra-226 Radium-226
Tetra Tech Tetra Tech, Inc.

A qualitative relationship between the 2013 raw gamma dataset and the 2022 estimated radium dataset, by applying both Model 1 and Model 2, was derived with a coefficient of determination (R^2) of 0.757. This relationship allows conversion of the downhole gamma raw counts to estimated radium-226 (Ra-226) concentrations. Eqn-I7 and Eqn-I8 indicate the relationship between the Intera shielded downhole gamma raw counts and Tetra Tech estimated Ra-226 concentrations by applying both Model 1 and Model 2:

$$Gamma_{Intera, Model\ 1}(cpm) = 121.5x \cdot \left[{}^{226}Ra_{Tt,estimated,Model\ 1} \left(\frac{pCi}{g} \right) \right] + 1967.5 \quad \text{Eqn-I7}$$

$$Gamma_{Intera, Model\ 2}(cpm) = 212.93x \cdot \left[{}^{226}Ra_{Tt,estimated,Model\ 2} \left(\frac{pCi}{g} \right) \right] + 1666.5 \quad \text{Eqn-I8}$$

Per the findings in Appendix E from applications of Model 1 and Model 2, Model 1 more accurately models the gamma-radium correlation in areas higher than background, while Model 2 more accurately models the gamma-radium correlation in areas close to background. [Table I-5](#) summarizes the downhole gamma equivalents to benchmark Ra-226 concentrations.

Table I-5. 2013 Downhole Gamma Equivalents to Ra-226 Concentrations (Estimated)

Estimated Ra-226 Concentration (pCi/g)	Gamma-Radium Correlation Model	Downhole Gamma (cpm)
2	2	2,100
5	1	2,500
10	1	3,200
15	1	3,800
25	1	5,000

Notes:

cpm Counts per minute

pCi/g Picocuries per gram

By use of the downhole gamma values corresponding to Ra-226 concentrations listed in [Table I-5](#), the downhole gamma data from the 2013 investigation boring logs can be analyzed to determine the depth at which Ra-226 concentration drops below a benchmark value. These results are summarized in [Table I-6](#).

The results listed in [Table I-6](#) can be analyzed by application of an interpolation method of inverse distance weight (IDW), which allows estimate of depth of contamination at any of the Ra-226 concentrations identified in [Table I-6](#) at any point between neighboring boreholes.

Table I-6. Estimated Maximum Depths of Various Ra-226 Concentrations

Boring ID	Surface Gamma (cpm)	Maximum Drill Depth (feet bgs)	Depth to: (feet)					Note
			2 pCi/g (2100 cpm)	5 pCi/g (2500 cpm)	10 pCi/g (3200 cpm)	15 pCi/g (3800 cpm)	25 pCi/g (5000 cpm)	
SB-2	1,623	8	0	0	0	0	0	
SB-3	1,909	12	0	0	0	0	0	Reaches 2,100 cpm at 8 feet
SB-4	2,266	4	3	1.5	0	0	0	
SB-5	2,101	8	5	0	0	0	0	
SB-6	1,776	20	0	0	0	0	0	
SB-8	2,087	24	4.5	0	0	0	0	
SB-10	1,647	4	0	0	0	0	0	
SB-12	1,694	8	0	0	0	0	0	
SB-18	1,922	4	2	0	0	0	0	
SB-19	1,686	4	0	0	0	0	0	
SB-20	2,195	8	8	0	0	0	0	
SB-21	3,082	4	4	3	0	0	0	Contamination above 2 pCi/g may continue
SB-22	2,011	4	0	0	0	0	0	
SB-24	2,407	12	12	3	0	0	0	Contamination above 2 pCi/g may continue
SB-25	2,734	4	4	0.5	0	0	0	Contamination above 2 pCi/g may continue
SB-26	2,041	4	4	0	0	0	0	Contamination above 2 pCi/g may continue
SB-27	2,308	4	4	0	0	0	0	Contamination above 2 pCi/g may continue
SB-28	1,573	4	0	0	0	0	0	
SB-29	7,296	8	8	7	1	1	1	Contamination above 5 pCi/g may continue
SB-30	2,344	4	4	0	0	0	0	Contamination above 2 pCi/g may continue

Table I-6. Estimated Maximum Depths of Various Ra-226 Concentrations

Boring ID	Surface Gamma (cpm)	Maximum Drill Depth (feet bgs)	Depth to: (feet)					Note
			2 pCi/g (2100 cpm)	5 pCi/g (2500 cpm)	10 pCi/g (3200 cpm)	15 pCi/g (3800 cpm)	25 pCi/g (5000 cpm)	
SB-31	2,289	4	4	0	0	0	0	Contamination above 2 pCi/g may continue
SB-32	2,094	4	2.5	0	0	0	0	
SB-34	2,332	4	4	0	0	0	0	Contamination above 2 pCi/g may continue
SB-35	2,196	8	8	0	0	0	0	Contamination above 2 pCi/g may continue
SB-36	3,647	4	4	4	4	2.5	0	Contamination above 10 pCi/g may continue
SB-37	7,169	4	4	4	4	4	4	Contamination above 25 pCi/g may continue
SB-38	9,030	8	8	8	8	8	1	Contamination above 15 pCi/g may continue
SB-39	2,443	8	8	2.5	0	0	0	Contamination above 2 pCi/g may continue
SB-42	2,581	4	4	0.5	0	0	0	Contamination above 2 pCi/g may continue
SB-43	6,557	4	4	4	4	3	0.5	Contamination above 10 pCi/g may continue
SB-44	2,026	8	0	0	0	0	0	
SB-45	17,742	4	4	4	4	4	4	Contamination above 25 pCi/g may continue
SB-46	3,396	8	8	8	8	0	0	Contamination above 10 pCi/g may continue
SB-47	2,314	8	8	0	0	0	0	Contamination above 2 pCi/g may continue
SB-49	2,434	4	4	2.5	0	0	0	Contamination above 2 pCi/g may continue
SB-50	2,998	4	4	4	1	0	0	Contamination above 5 pCi/g may continue
SB-51	2,455	4	0.5	0	0	0	0	
SB-52	4,129	12	1	1	1	1	0	

Table I-6. Estimated Maximum Depths of Various Ra-226 Concentrations

Boring ID	Surface Gamma (cpm)	Maximum Drill Depth (feet bgs)	Depth to: (feet)					Note
			2 pCi/g (2100 cpm)	5 pCi/g (2500 cpm)	10 pCi/g (3200 cpm)	15 pCi/g (3800 cpm)	25 pCi/g (5000 cpm)	
SB-53	21,737	4	4	4	4	4	4	Contamination above 25 pCi/g may continue
SB-54	3,515	8	8	8	7	0	0	Contamination above 10 pCi/g may continue
SB-55	2,408	4	4	0	0	0	0	Hovers around 2,100 cutoff
SB-58	2,541	8	8	8	0	0	0	Contamination above 5 pCi/g may continue
SB-59	3,425	8	8	8	8	0	0	Contamination above 10 pCi/g may continue
SB-60	20,130	12	12	12	12	12	12	Contamination above 25 pCi/g may continue
SB-61	21,499	24	24	24	24	24	24	Contamination above 25 pCi/g may continue
SB-62	4,681	4	4	4	4	4	0	Contamination above 15 pCi/g may continue
SB-63	2,904	4	4	4	0	0	0	Contamination above 5 pCi/g may continue
SB-64	1,809	4	0	0	0	0	0	Reaches 2100 cpm at 4 feet
SB-65	2,431	8	8	5.5	0	0	0	Contamination above 2 pCi/g may continue
SB-66	5,800	16	16	16	13	4	4	Contamination above 5 pCi/g may continue
SB-67	3,695	4	4	4	4	0	0	Contamination above 10 pCi/g may continue
SB-68	8,859	4	4	4	4	4	4	Contamination above 25 pCi/g may continue
SB-69	7,665	12	12	12	12	12	12	Contamination above 25 pCi/g may continue
SB-70	4,908	4	4	4	4	4	0	Contamination above 15 pCi/g may continue
SB-71	2,301	4	4	0	0	0	0	Contamination above 2 pCi/g may continue
SB-72	1,914	8	0	0	0	0	0	

Table I-6. Estimated Maximum Depths of Various Ra-226 Concentrations

Boring ID	Surface Gamma (cpm)	Maximum Drill Depth (feet bgs)	Depth to: (feet)					Note
			2 pCi/g (2100 cpm)	5 pCi/g (2500 cpm)	10 pCi/g (3200 cpm)	15 pCi/g (3800 cpm)	25 pCi/g (5000 cpm)	
SB-73	2,590	4	4	4	0	0	0	Contamination above 5 pCi/g may continue
SB-74	2,760	8	8	8	0	0	0	Contamination above 5 pCi/g may continue
SB-75	3,217	4	4	4	2.5	0	0	Contamination above 5 pCi/g may continue
SB-76	3,606	4	4	4	4	0	0	Contamination above 10 pCi/g may continue
SB-77	3,636	4	4	4	1	0	0	Contamination above 5 pCi/g may continue
SB-78	2,501	8	8	8	0	0	0	Contamination above 5 pCi/g may continue
SB-79	2,138	8	0.5	0	0	0	0	
SB-80	2,362	8	8	2.5	0	0	0	Contamination above 2 pCi/g may continue
SB-81	2,437	8	8	8	0	0	0	Reaches 2500 cpm at 6.5 ft Contamination above 2 pCi/g may continue
SB-85	2,323	4	4	0	0	0	0	Contamination above 2 pCi/g may continue
SB-86	2,177	4	4	0	0	0	0	Contamination above 2 pCi/g may continue
SB-91	2,697	4	4	2.5	0	0	0	Contamination above 2 pCi/g may continue
SB-102	1,700	12	0	0	0	0	0	
SB-103	1,723	12	0	0	0	0	0	

Notes:

bgs Below ground surface
cpm Counts per minute
pCi/g Picocurie per gram

4.3 WASTE REMOVAL VOLUME ESTIMATES

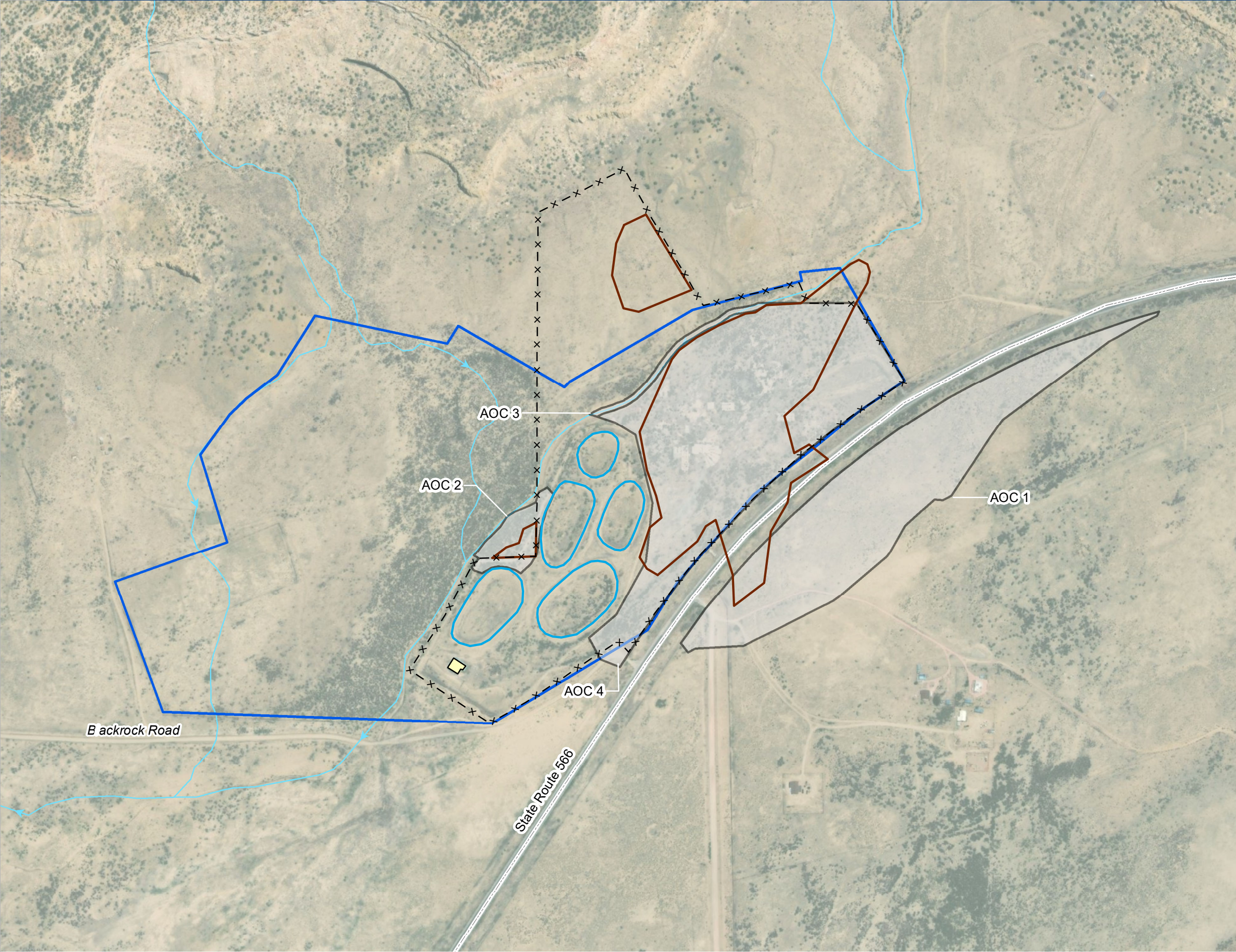
Based on results from the removal assessment, potential exposure pathways from contamination pose a potential threat to nearby residents in the following four areas of concern at the OCRM site (see [Figure I-3](#)):

- **Area 1** is on the south/southeast side of State Route 566 from OCRM, on a nearby resident's grazing lands. Contamination was identified in this area as a result of windblown transport, as well as an extension of the mine waste piles deposited prior to construction of Route 566. Removing material from this area would mitigate surficial exposure to contamination caused by windblown transport and past mine waste deposition.
- **Area 2** is a berm of waste material partially within but primarily outside the western fenced area at OCRM, but east of the eastern bank of the unnamed arroyo that runs west of OCRM. Removing material from this area would mitigate potential for windblown and stormwater transport of contaminants into the arroyo.
- **Area 3** is the eastern bank of the unnamed arroyo upstream of Area 2 running beside OCRM from the center point of the arroyo and 10 feet inward toward the eastern bank. Area 3 extends from where a road crosses through the arroyo in Section 17 to where the arroyo crosses into Section 8. Removing material from this area would mitigate potential for windblown and stormwater transport of contaminants into the arroyo.
- **Area 4** encompasses the surficial waste material within the fenced area of the OCRM site, excluding Area 3 and the areas around the former settling ponds and ion-exchange building. Removing material from this area would mitigate potential for windblown transport off site.

A fifth area of potential concern is a waste disposal area north of the unnamed arroyo in an open field within Section 8. While this area is of concern, it is not considered to pose an imminent and substantial threat to the nearby community. It will be addressed along with all other areas of concern through the non-time-critical removal action process.

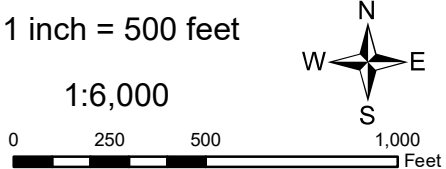
[Figure I-4](#), [Figure I-5](#), [Figure I-6](#), [Figure I-7](#), and [Figure I-8](#) show areal extents of Ra-226 contamination at concentrations of 2, 5, 10, 15, and 25 pCi/g, respectively, to maximum estimated depth.

[Table I-7](#) summarizes the total volume of material exceeding various levels of contamination in each of the areas, as well as the total volume exceeding various levels of contamination to maximum depth of 2 feet bgs.



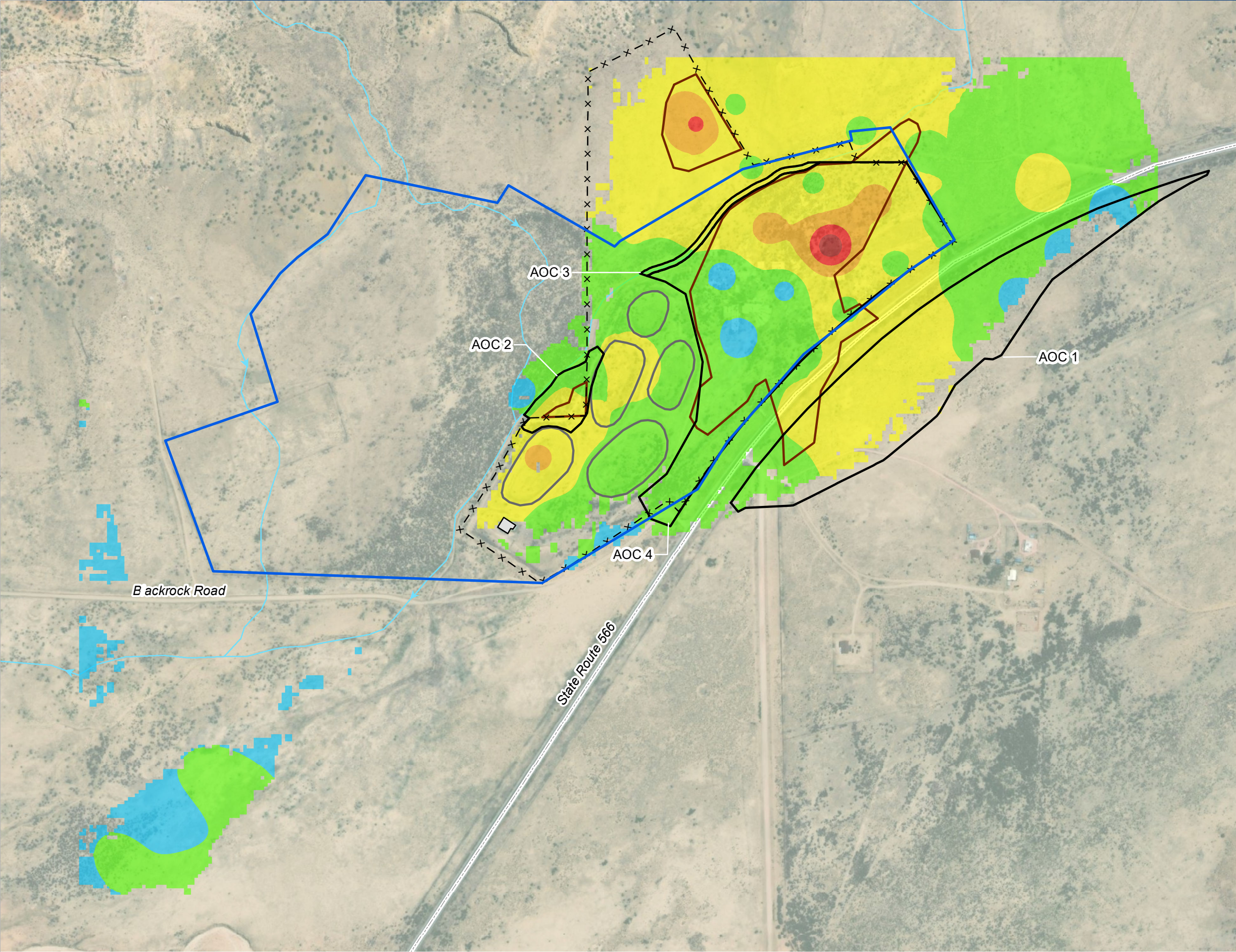
- Aera of Concern
- AUM Site Boundary
- Site Features**
- × — Fenced Boundary
- Former Pond
- Ion Exchange Building
- Approximate Waste Disposal Area
- Community Road
- Surface Water Pathway¹

Notes:
¹All surface water pathways drain to the Puerco River.
AOC Area of concern
AUM Abandoned uranium mine



OLD CHURCH ROCK MINE
AREAS OF CONCERN

Prepared For: U.S. EPA Region 9	Prepared By:
	TETRA TECH
Task Order No.: 0016	Contract No.: EP-S9-17-03
Location: CHURCH ROCK CHAPTER NAVAJO NATION	Date: 4/4/2023
Coordinate System: NAD 1983 State Plane Arizona East FIPS 0201 Feet Transverse Mercator	Figure No.: I-3



- Area of Concern
- Cleanup Depth (feet)
- at 2pCi/g Estimated Radium-226
- ≤ 2
 - 2 - 5
 - 5 - 10
 - 10 - 15
 - 15 - 20
 - > 20
- AUM Site Boundary
- Site Features
- × — Fenced Boundary
 - Former Pond
 - Ion Exchange Building
 - Approximate Waste Disposal Area
 - Community Road
 - Surface Water Pathway¹

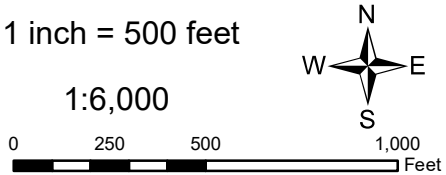
Notes:

¹All surface water pathways drain to the Puerco River.

AOC Area of concern

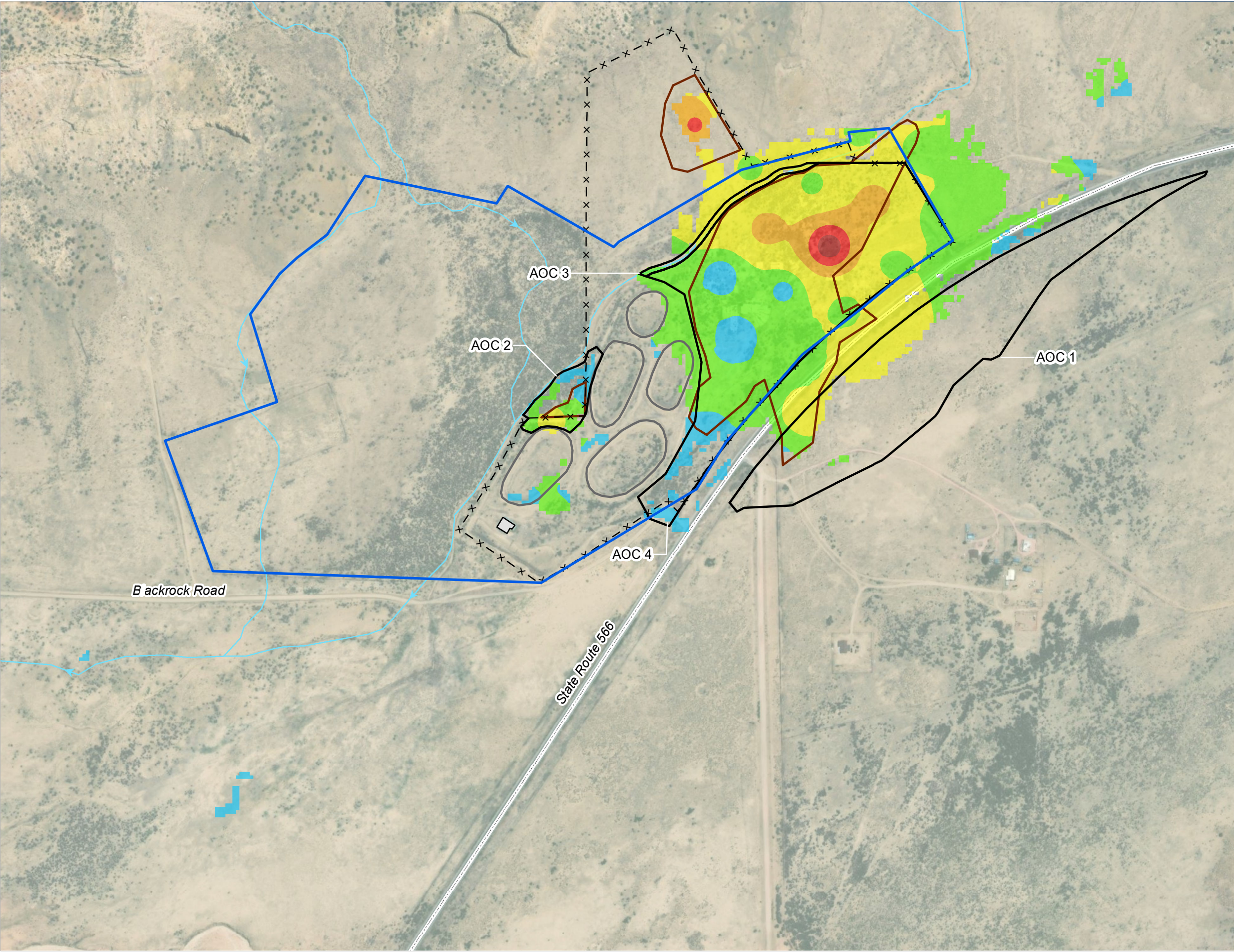
AUM Abandoned uranium mine

pCi/g Picocurie per gram



OLD CHURCH ROCK MINE
ESTIMATED DEPTH OF
RADIUM-226 CONTAMINATION
AT 2 PC/G

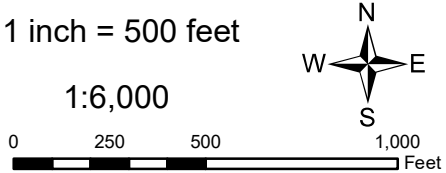
Prepared For: U.S. EPA Region 9	Prepared By:
	TETRA TECH
Task Order No.: 0016	Contract No.: EP-S9-17-03
Location: CHURCH ROCK CHAPTER NAVAJO NATION	Date: 4/4/2023
Coordinate System: NAD 1983 State Plane Arizona East FIPS 0201 Feet Transverse Mercator	Figure No.: I-4



- Aera of Concern
- Cleanup Depth (feet)**
at 5pCi/g Estimated Radium-226
- ≤ 2
- 2 - 5
- 5 - 10
- 10 - 15
- 15 - 20
- > 20
- AUM Site Boundary
- Site Features**
- ×

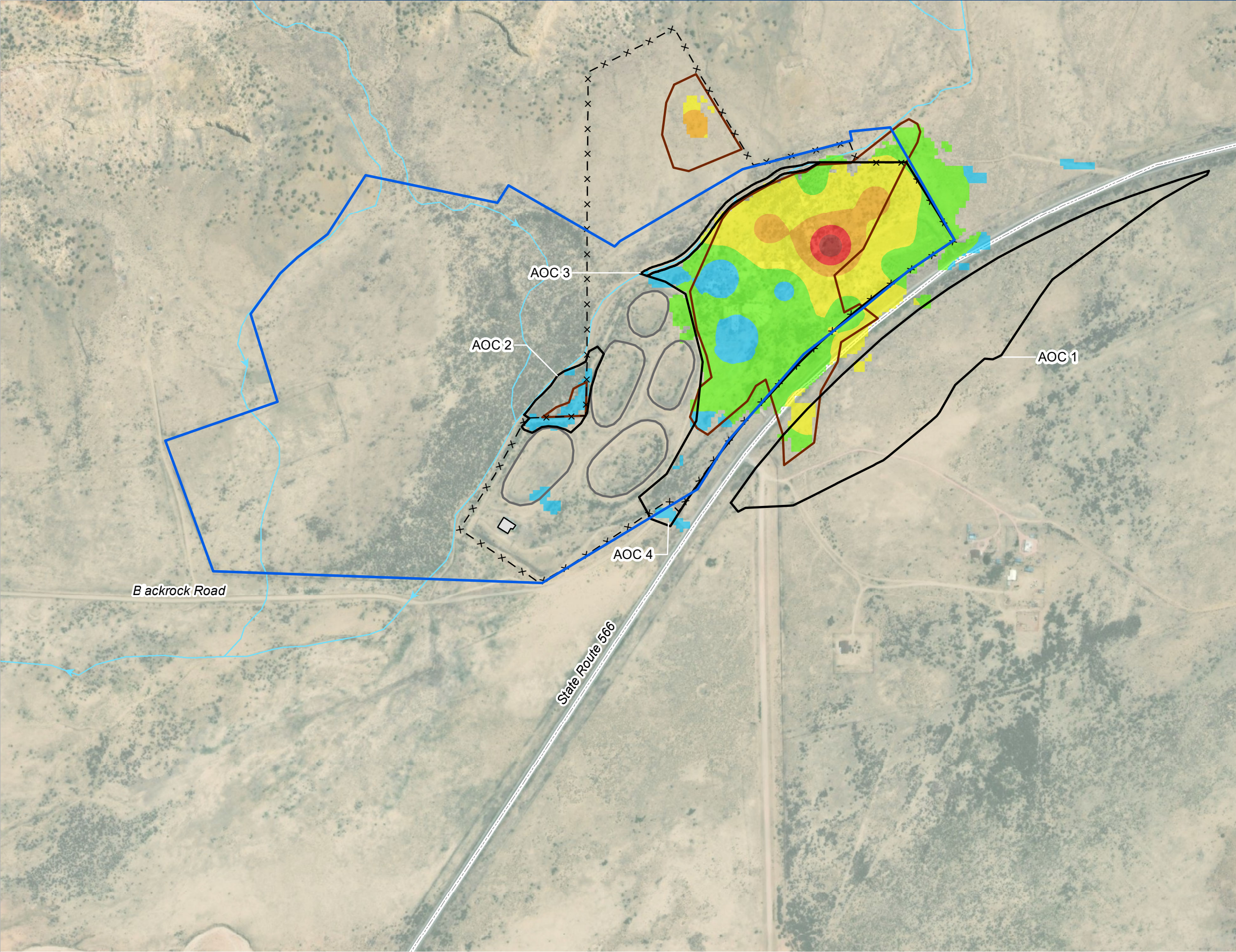
Fenced Boundary
- Former Pond
- Ion Exchange Building
- Approximate Waste Disposal Area
- Community Road
- Surface Water Pathway¹

Notes:
¹All surface water pathways drain to the Puerco River.
AOC Area of concern
AUM Abandoned uranium mine
pCi/g Picocurie per gram



OLD CHURCH ROCK MINE
ESTIMATED DEPTH OF
RADIUM-226 CONTAMINATION
AT 5 PCI/G

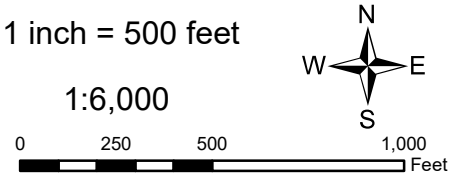
Prepared For: U.S. EPA Region 9	Prepared By:
	TETRA TECH
Task Order No.: 0016	Contract No.: EP-S9-17-03
Location: CHURCH ROCK CHAPTER NAVAJO NATION	Date: 4/4/2023
Coordinate System: NAD 1983 State Plane Arizona East FIPS 0201 Feet Transverse Mercator	Figure No.: I-5



- Area of Concern
- Cleanup Depth (feet)
at 10 pCi/g Estimated Radium-226
- ≤ 2
- 2 - 5
- 5 - 10
- 10 - 15
- 15 - 20
- > 20
- AUM Site Boundary
- Site Features
- ×

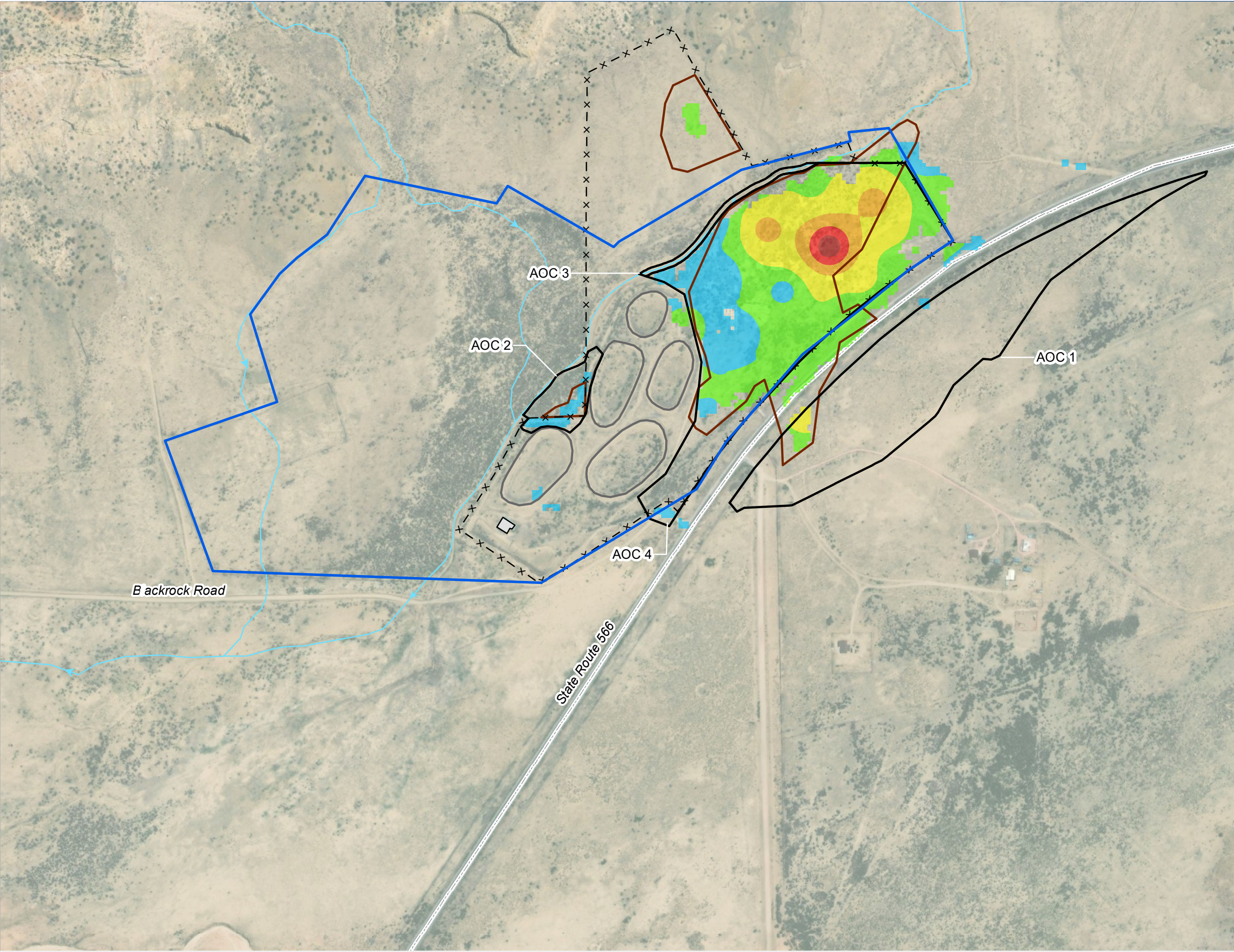
Fenced Boundary
- Former Pond
- Ion Exchange Building
- Approximate Waste Disposal Area
- Community Road
- Surface Water Pathway¹

Notes:
¹All surface water pathways drain to the Puerco River.
AOC Area of concern
AUM Abandoned uranium mine
pCi/g Picocurie per gram



OLD CHURCH ROCK MINE
ESTIMATED DEPTH OF
RADIUM-226 CONTAMINATION
AT 10 PCI/G

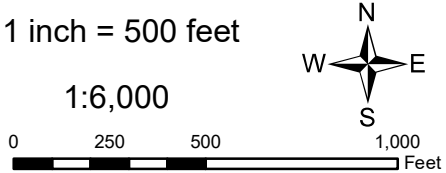
Prepared For: U.S. EPA Region 9	Prepared By:
	TETRA TECH
Task Order No.: 0016	Contract No.: EP-S9-17-03
Location: CHURCH ROCK CHAPTER NAVAJO NATION	Date: 4/4/2023
Coordinate System: NAD 1983 State Plane Arizona East FIPS 0201 Feet Transverse Mercator	Figure No.: I-6



- Area of Concern
- Cleanup Depth (feet)
at 15 pCi/g Estimated Radium-226
- ≤ 2
- 2 - 5
- 5 - 10
- 10 - 15
- 15 - 20
- > 20
- AUM Site Boundary
- Site Features
- ×

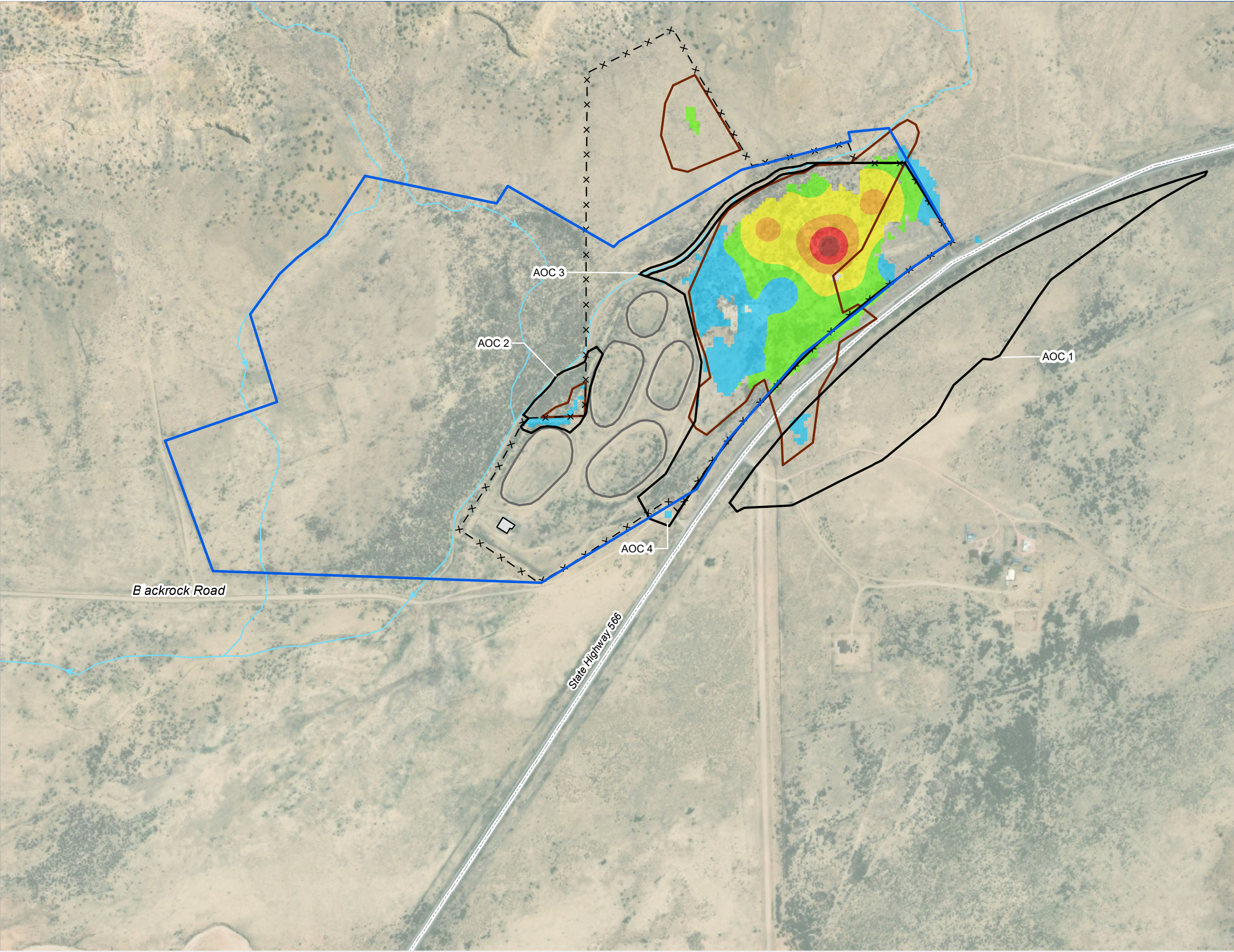
Fenced Boundary
- Former Pond
- Ion Exchange Building
- Approximate Waste Disposal Area
- Community Road
- Surface Water Pathway¹

Notes:
¹All surface water pathways drain to the Puerco River.
AOC Area of concern
AUM Abandoned uranium mine
pCi/g Picocurie per gram



OLD CHURCH ROCK MINE
ESTIMATED DEPTH OF
RADIUM-226 CONTAMINATION
AT 15 PCi/G

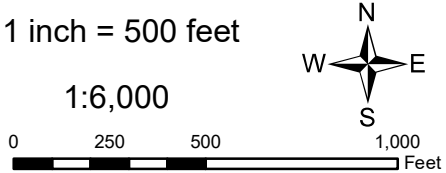
Prepared For: U.S. EPA Region 9	Prepared By:
	TETRA TECH
Task Order No.: 0016	Contract No.: EP-S9-17-03
Location: CHURCH ROCK CHAPTER NAVAJO NATION	Date: 4/4/2023
Coordinate System: NAD 1983 State Plane Arizona East FIPS 0201 Feet Transverse Mercator	Figure No.: I-7



- Aera of Concern
- Cleanup Depth (feet)**
at 25 pCi/g Estimated Radium-226
- ≤ 2
- 2 - 5
- 5 - 10
- 10 - 15
- 15 - 20
- > 20
- AUM Site Boundary
- Site Features**
- ×

Fenced Boundary
- Former Pond
- Ion Exchange Building
- Approximate Waste Disposal Area
- Community Road
- Surface Water Pathway¹

Notes:
¹All surface water pathways drain to the Puerco River.
AOC Area of concern
AUM Abandoned uranium mine
pCi/g Picocurie per gram



OLD CHURCH ROCK MINE
ESTIMATED DEPTH OF
RADIUM-226 CONTAMINATION
AT 25 PCi/G

Prepared For: U.S. EPA Region 9	Prepared By:
	TETRA TECH
Task Order No.: 0016	Contract No.: EP-S9-17-03
Location: CHURCH ROCK CHAPTER NAVAJO NATION	Date: 4/4/2023
Coordinate System: NAD 1983 State Plane Arizona East FIPS 0201 Feet Transverse Mercator	Figure No.: I-8

Table I-7. Area of Concern Volume Estimates

Area of Concern	Target Ra-226 Cleanup Concentration (pCi/g)	Total Surface Area (acres)	Average Depth (feet)	Total Estimated Volume Maximum Estimated Depth (CY)	Total Estimated Volume Maximum 2 feet bgs (CY)
Total Site	2	170	5.3	1,447,277	532,983
	5	56	5.3	477,479	9,571
	10	36	5.3	305,224	8,316
	15	29	3.8	224,461	12,484
	25	22	4.8	168,821	11,395
Area 1 – Offsite Grazing Area ¹	2	15	5.3	130,970	47,993
	5	-	-	-	-
	10	-	-	-	-
	15	-	-	-	-
	25	-	-	-	-
Area 2 – Waste Material Berm	2	2.1	5.5	18,453	6,694
	5	1.4	3.0	6,839	3,629
	10	0.8	0.5	628	628
	15	0.6	0.5	512	512
	25	0.3	0.6	341	341
Area 3 – Arroyo Bank	2	0.8	6.1	7,462	2,458
	5	0.6	6.2	6,004	2,458
	10	0.1	5.6	953	319
	15	0.0	0.0	0	0
	25	0.0	0.0	0	0
Area 4 – Main Site	2	29	6.1	281,909	91,228
	5	27	5.9	257,797	83,403
	10	26	5.6	233,728	80,543
	15	24	5.3	201,761	70,314
	25	20	5.1	162,839	54,502

**Table I-7. Area of Concern Volume Estimates**

Notes:

- ¹ Area 1 cleanup volumes are estimated only for 2 pCi/g because the critical exposure pathway to residents is through animal product consumption.
- bgs Below ground surface
- CY Cubic yard
- pCi/g Picocurie per gram
- Ra-226 Radium-226



5.0 REFERENCES

- Hydro Resources, Inc. (HRI). 1996. "Prior Reclamation Status – Churchrock Mine McKinley, County, New Mexico."
- Intera. 2013. "2013 Phase II Site Characterization Report Old Church Rock Mine McKinley County, New Mexico." September.
- Tetra Tech, Inc. (Tetra Tech). 2022. "OCRM Removal Assessment Sampling and Analysis Plan." Response, Assessment, and Evaluation Services. Contract No. EP-S9-17-02. Task Order 0035.

ATTACHMENT I-1: HRI LETTER

HRI, INC.

(A Subsidiary of Uranium Resources, Inc.)

5656 South Staples
Suite 250, LB 8
Corpus Christi, Texas 78411
Telephone: (512) 993-7731
Fax: (512) 993-5744

12750 Merit Drive
Suite 1020, LB 12
Dallas, Texas 75251
Telephone: (214) 387-7777
Fax: (214) 387-7779

P.O. Box 777
Crownpoint, New Mexico 87313
Telephone: (505) 786-5845
Fax: (505) 786-5555

April 15, 1996

Dr. Kathleen A. Garland, Director
Mining and Minerals Division
New Mexico Energy, Minerals and Natural Resources Department
P.O. Box 6429
Santa Fe, New Mexico 87505-6429

RE: Prior Reclamation Status - Churchrock Mine
McKinley County, New Mexico



Dear Dr. Garland:

The following Amendment of HRI's prior reclamation plan for the subject property is submitted pursuant to your letter dated September 29, 1995, and more recent telephone conversations with Mr. Holland Sheperd. Our intent is to perform the work in 1996.

You noted in your letter that HRI is proposing to license this facility with the Nuclear Regulatory Commission for in-situ mining. You are correct. We expect licensing to be complete at the end of this year. The entire area being considered for Prior Reclamation Improvement falls within the NRC license area and will be disturbed through in-situ wellfield development. If this results in an exemption from the New Mexico Mining Act, please notify me, as we would prefer to perform the dirtwork and revegetation portion of the attached plan only once, that is after in-situ mining development.

Thank you for your assistance in this matter.

Sincerely,

Mark S. Pelizza
Vice President
Health, Safety and Environmental Affairs

cc: Salvador Chavez, HRI, Inc./Crownpoint, New Mexico

Proposed Improvements to Prior Reclamation HRI, Inc. Churchrock Site

Introduction

On September 29, 1995, New Mexico Energy Minerals and Natural Resources Department advised HRI of three areas where additional remediation would be required at the Section 17 Churchrock Site, before "Prior Reclamation" status could be approved. These included the following:

1. Removal and burial of all concrete slabs and foundations that can be safely removed without affecting the structural integrity of the mine shafts or their steel and concrete covers.
2. Regrading of embankments around each pond.
3. Discing and reseeding of barren and disturbed areas.

This report will detail HRI's plan for each of the three items slated above.

Concrete Removal

The building and Hoist Foundation slabs will be broken up into small enough pieces to transport them to the No. 1 Pond for burial. This will be done by ripping with a dozer, lifting with a loader and cutting the reinforced steel with a torch. The anticipated quantity of material is tabulated below.

Buildings and Equipment Slabs

(L) x (W) x (H)
30' x 24' x 1/2' = 360 Cu. ft.
20' x 16' x 1/2' = 160
42' x 95' x 1/2' = 1,995
12' x 12' x 1/2' = 72
7' x 9' x 1/2' = 32
8' x 10' x 1/2' = 40
40' x 24' x 1/2' = 480
10' x 8' x 1/2' = 40
3' x 3' x 1/2' = 5
3' x 3' x 1/2' = 5
16' x 35' x 1/2' = 280
65' x 40' x 1/2' = 1,300
140' x 35' x 1/2' = 2,450
10' x 20' x 1/2' = 100
5' x 20' x 1/2' = 50
16' x 20' x 1/2' = 160
10' x 12' x 1/2' = 60
7,589 = 280 Cu.yds.

Hoist Foundations

(L) x (W) x (H)
10' x 20' x 3' = 600 Cu. ft.
16' x 32' x 4' = 2,048
16' x 35' x 3' = 1,680
4,328 Cu. yds.

As built drawing for the Hoist Foundations have not been located. Excavation will be done to determine the actual thickness, time, effort and cost to remove these slabs. If the equipment made available for this job is not adequate to break up and remove these slabs, they will be left in place. Provisions for drilling and blasting or for specialized concrete breaking equipment have not been made for this job because, doing so may threaten the integrity of the shafts. Removal of slabs will be limited to what can be removed with the equipment specified in this report.

The concrete that obviously extends above the ground at the shafts will be broken down to the level of the collar slabs.

The quantity of material from headframe slabs at the escape shaft will be calculated below:

$$\begin{aligned} (L) \times (W) \times (L) \\ 38' \times 3' \times 4' &= 456 \text{ Cu. ft.} \\ 38' \times 3' \times 4' &= 456 \text{ Cu. ft.} \end{aligned}$$

$$\begin{aligned} (L) \times (W) \times (L) \\ 45' \times 4' \times 1/2' &= 90 \text{ Cu.ft.} \\ 1,002 \text{ Cu. ft.} &= 37 \text{ Cu. yds.} \end{aligned}$$

The two slabs that comprise the shaft collars can not be removed without affecting the integrity of the two 10' diameter shafts and will be left intact. The quantity of concrete to be left in place is tabulated below.

Escape Shaft	$68' \times 42' \times 2' = 5,712$
Main Shaft	$97' \times 55' \times 2' = \underline{10,670}$
	16,382 Cu. ft. = 607 Cu. yds.

Regrading Embankment of Five Existing Ponds

The berms surrounding each of the five ponds will be pushed into the ponds. There is not enough soil in the pond berms to fill the ponds so the soil will be pushed toward the center of the ponds leaving a gradual downgrade toward the center. This work will be done with the use of a dozer and a loader. A total of 17,000 cubic yards will be moved for this purpose. (See tabulation in Attachments.)

The scrap metal that was removed when the cement seals were poured on the two main shafts, one vent shaft (42" diameter) and one gravel hole (12" diameter) will be buried in the No. 1 pond with the concrete. An old metal water tank and several metal manholes will also be removed and buried.

Final grading of the site will be so that runoff ends up in an existing catch pond on the south side of the property.

Reseeding and Revegetation

The areas in the vicinity of the shafts that have not supported vegetation will be covered with soil borrowed from a berm that surrounds the ponds. These areas total 3-3/4 acres and will be covered with 6" of soil. A total of 3,000 cubic yards of soil will be moved for this purpose. This will be done with the use of loaders, belly dump trucks and a blade to spread the soil.

Reseeding of all disturbed areas will be done before the rainy season and will be done with a 50/50 mixture of Alkali sacation and western wheatgrass at the rate of 10# per acre.

The areas to be reseeded are:

Concrete Slab Removal	1/4 acre
Regrading of Ponds	12 acres
Areas covered with 6" of soil	<u>3-3/4 acres</u>
	16 acres

The equipment that will be used will consist of:

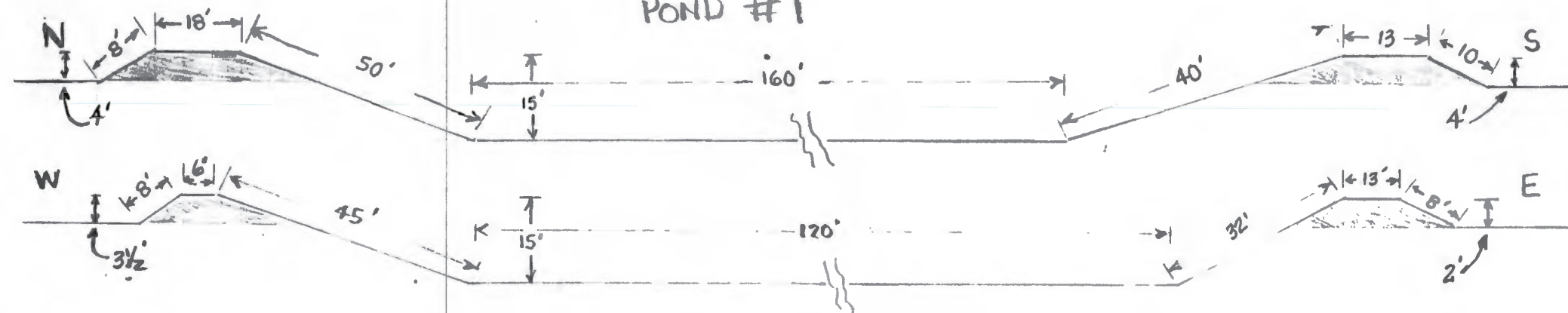
One CAT 980 Loader
6 yard bucket
Three Belly Dump Trucks 12-G Cat Blade
TD25G - (D-8 Equivalent) Dozer

There will be a total of 20,000 cubic yards of dirt moved and 478 cubic yards of cement will be broken, moved and buried. The job is expected to take 20 working days.

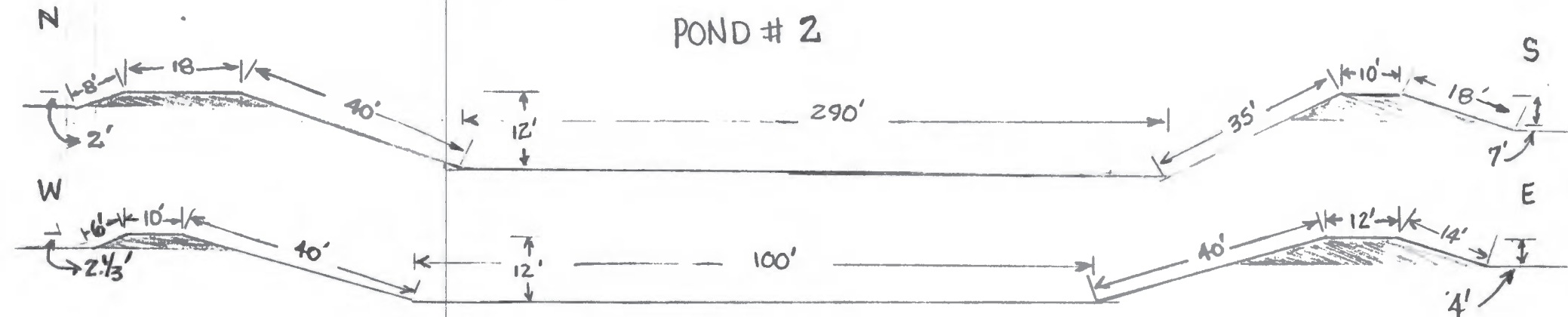
Attachment

Various Maps and Drawings

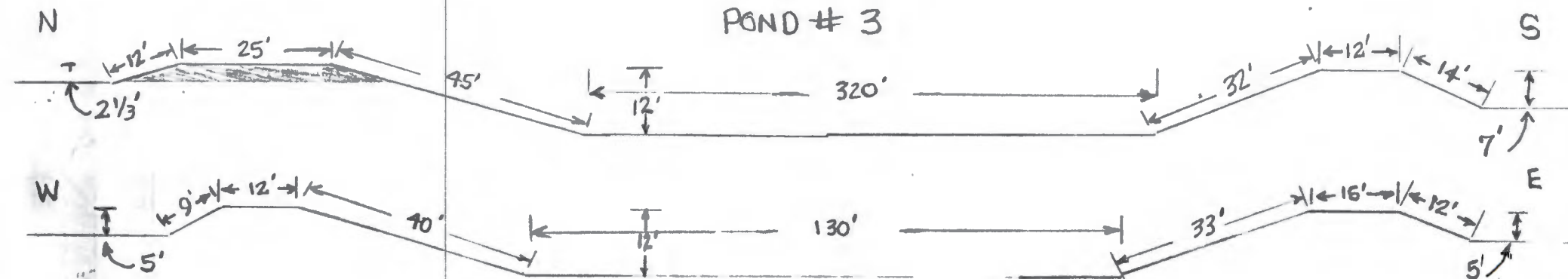
POND # 1

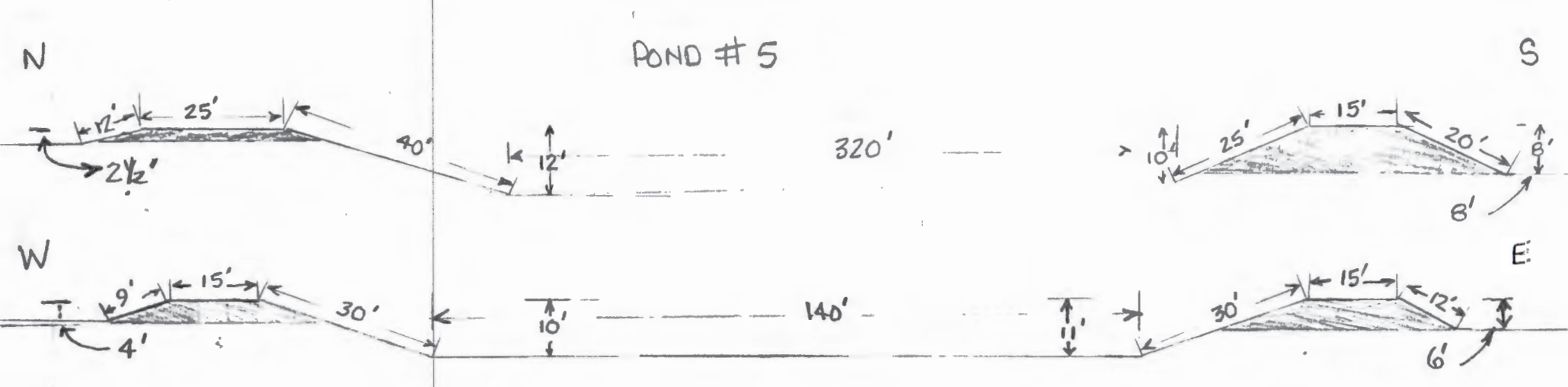
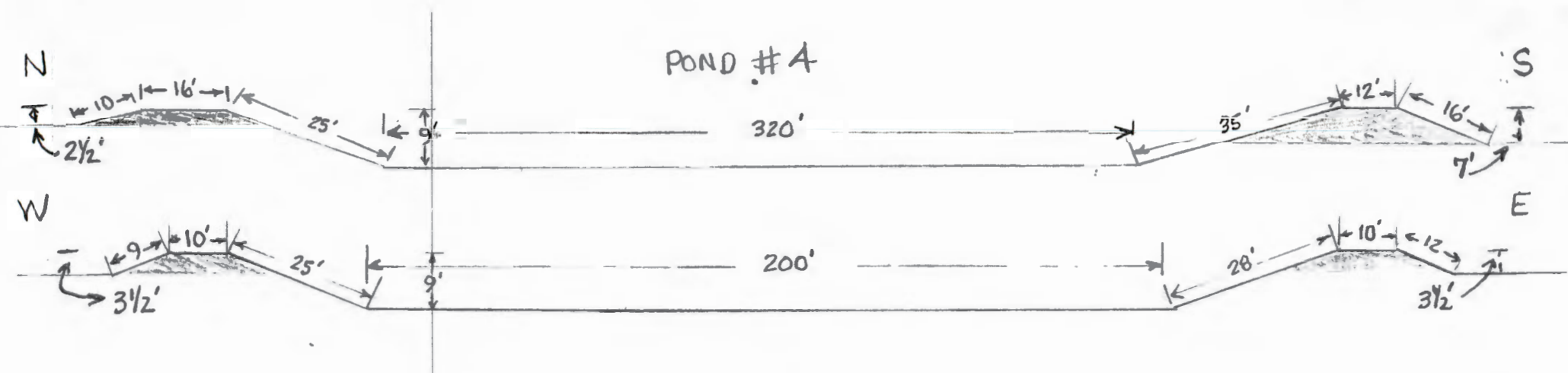


POND # 2



POND # 3





POND #1

N



$$\begin{aligned} 37 \times 4 &= 148 \\ \textcircled{A} \quad 11 \times 4 \times \frac{1}{2} &= < 22 > \\ \textcircled{B} \quad 7 \times 4 \times \frac{1}{2} &= < 14 > \\ \hline &112 \text{ sq ft} \end{aligned}$$

$$112 \times 120 = 13,440 \text{ cu}$$

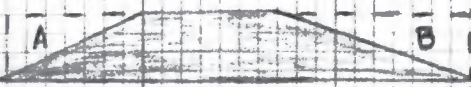
S



$$\begin{aligned} 31 \times 4 &= 124 \\ \text{A} \quad 9 \times 4 \times \frac{1}{2} &= < 18 > \\ \text{B} \quad 8 \times 4 \times \frac{1}{2} &= < 16 > \\ \hline &90 \text{ sq ft} \end{aligned}$$

$$90 \times 120 = 10,800 \text{ cu}$$

W



$$\begin{aligned} 24 \times 3\frac{1}{2} &= 84 \\ \text{A} \quad 6 \times 3\frac{1}{2} \times \frac{1}{2} &= < 10 > \\ \text{B} \quad 10 \times 3\frac{1}{2} \times \frac{1}{2} &= < 17 > \\ \hline &57 \text{ sq ft} \end{aligned}$$

$$57 \times 160 = 9,120 \text{ cu}$$

E



$$\begin{aligned} 25 \times 2 &= 50 \\ \text{A} \quad 7 \times 2 \times \frac{1}{2} &= < 7 > \\ \text{B} \quad 4 \times 2 \times \frac{1}{2} &= < 4 > \\ \hline &39 \text{ sq ft} \end{aligned}$$

$$39 \times 160 = 6,240 \text{ cu}$$

10'

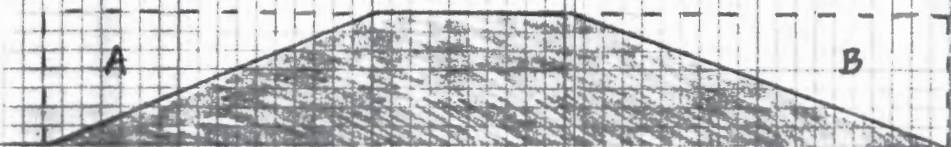
$$39,600 \div 27 = 1,467 \text{ cu yds}$$

POND. # 2



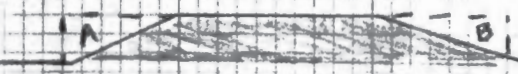
$$\begin{aligned} 32 \times 2 &= 64 \\ A \quad 8 \times 2 \times \frac{1}{2} &= < 8 > \\ B \quad 6 \times 2 \times \frac{1}{2} &= < 6 > \\ \hline &50 \text{ sq. ft} \end{aligned}$$

$$50 \times 100 = 5000 \text{ cu ft}$$



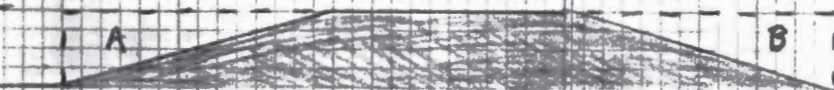
$$\begin{aligned} 47 \times 7 &= 329 \\ \textcircled{A} \quad 17 \times 7 \times \frac{1}{2} &= < 59 > \\ B \quad 20 \times 7 \times \frac{1}{2} &= < 70 > \\ \hline &200 \text{ sq. ft} \end{aligned}$$

$$200 \times 100 = 20,000 \text{ cu ft}$$



$$\begin{aligned} 23 \times 2\frac{1}{3} &= 54 \\ A \quad 6 \times 2\frac{1}{3} \times \frac{1}{2} &= < 7 > \\ B \quad 7 \times 2\frac{1}{3} \times \frac{1}{2} &= < 8 > \\ \hline &39 \text{ sq. ft} \end{aligned}$$

$$39 \times 290 = 11,310 \text{ cu ft}$$



$$\begin{aligned} 40 \times 4 &= 160 \\ A \quad 14 \times 4 \times \frac{1}{2} &= < 28 > \\ B \quad 14 \times 4 \times \frac{1}{2} &= < 28 > \\ \hline &104 \text{ sq. ft} \end{aligned}$$

$$104 \times 290 = 30,160 \text{ cu ft}$$

10'

$$66,470 \text{ sq. ft} \cdot 2462 \text{ cu yd}$$

POND # 3

47 x 2 1/3

110

A $12 \times 2 \frac{1}{3} \times \frac{1}{2} = < 14 >$

B $10 \times 2 \frac{1}{3} \times \frac{1}{2} = < 12 >$

84 sq. ft

84 x 130 = 10,920 cu ft

cu ft

42 x 7 = 294

A $13 \times 7 \times \frac{1}{2} = < 46 >$

B $17 \times 7 \times \frac{1}{2} = < 59 >$

189 sq. ft

189 x 130 = 24,570 cu ft

37 x 5 = 185

A $8 \times 5 \times \frac{1}{2} = < 20 >$

B $17 \times 5 \times \frac{1}{2} = < 42 >$

123 sq. ft

123 x 320 = 39,360 cu ft

39 x 5 = 195

A $11 \times 5 \times \frac{1}{2} = < 27 >$

B $13 \times 5 \times \frac{1}{2} = < 32 >$

136 sq. ft

136 x 320 = 43,520 cu ft

cu ft

10'

108,370.827 4384 cu yds

ROND # 4

N

A B

$$32 \times 2\frac{1}{2} = 80$$

$$A \quad 10 \times 2\frac{1}{2} \times \frac{1}{2} = < 12 >$$

$$B \quad 6 \times 2\frac{1}{2} \times \frac{1}{2} = < 8 >$$

$$60 \text{ sq. ft}$$

$$60 \times 200 = 12,000 \text{ cu. ft}$$

S

A

B

$$53 \times 7 = 371$$

$$A \quad 15 \times 7 \times \frac{1}{2} = < 52 >$$

$$B \quad 26 \times 7 \times \frac{1}{2} = < 91 >$$

$$228 \text{ sq. ft}$$

$$228 \times 200 = 45,600 \text{ cu. ft}$$

W

A

B

$$27 \times 3\frac{1}{2} = 95$$

$$A \quad 8 \times 3\frac{1}{2} \times \frac{1}{2} = < 14 >$$

$$B \quad 9 \times 3\frac{1}{2} \times \frac{1}{2} = < 16 >$$

$$65 \text{ sq. ft}$$

$$65 \times 320 = 20,800 \text{ cu. ft}$$

E

A

B

$$32 \times 3\frac{1}{2} = 112$$

$$A \quad 12 \times 3\frac{1}{2} \times \frac{1}{2} = < 21 >$$

$$B \quad 10 \times 3\frac{1}{2} \times \frac{1}{2} = < 17 >$$

$$74 \text{ cu. ft}$$

$$74 \times 320 = 23,680 \text{ cu. ft}$$

10'

$$102,000 \div 27 = 3781 \text{ cu. yds}$$

POND #5

$$\begin{aligned}
 &45 \times 2\frac{1}{2} = 113 \\
 &A \quad 12 \times 2\frac{1}{2} \times \frac{1}{2} = <15> \\
 &B \quad 8 \times 2\frac{1}{2} \times \frac{1}{2} = <10> \\
 &\quad \quad \quad \underline{88 \text{ sq. ft}}
 \end{aligned}$$

$$88 \times 140 = 12,320 \text{ cu. ft.}$$

$$\begin{aligned}
 &53 \times 8 = 424 \\
 &A \quad 19 \times 8 \times \frac{1}{2} = <76> \\
 &B \quad 19 \times 9 \times \frac{1}{2} = <76> \\
 &\quad \quad \quad \underline{272 \text{ sq. ft.}}
 \end{aligned}$$

$$272 \times 140 = 38,080 \text{ cu. ft.}$$

$$\begin{aligned}
 &34 \times 4 = 136 \\
 &A \quad 8 \times 4 \times \frac{1}{2} = <16> \\
 &B \quad 11 \times 4 \times \frac{1}{2} = <22> \\
 &\quad \quad \quad \underline{98 \text{ sq. ft.}}
 \end{aligned}$$

$$98 \times 320 = 31,360 \text{ cu. ft.}$$

$$\begin{aligned}
 &41 \times 6 = 246 \\
 &A \quad 11 \times 6 \times \frac{1}{2} = <33> \\
 &B \quad 15 \times 6 \times \frac{1}{2} = <45> \\
 &\quad \quad \quad \underline{168 \text{ sq. ft.}}
 \end{aligned}$$

$$168 \times 320 = 53,760 \text{ cu. ft.}$$

$$135,520 \div 27 = 5019 \text{ cu. yd.}$$

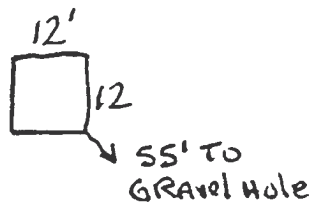
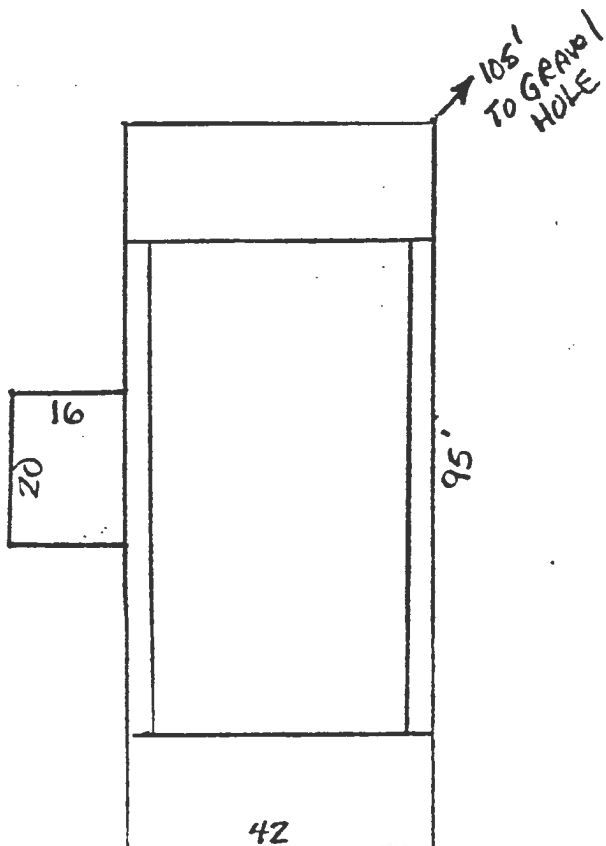
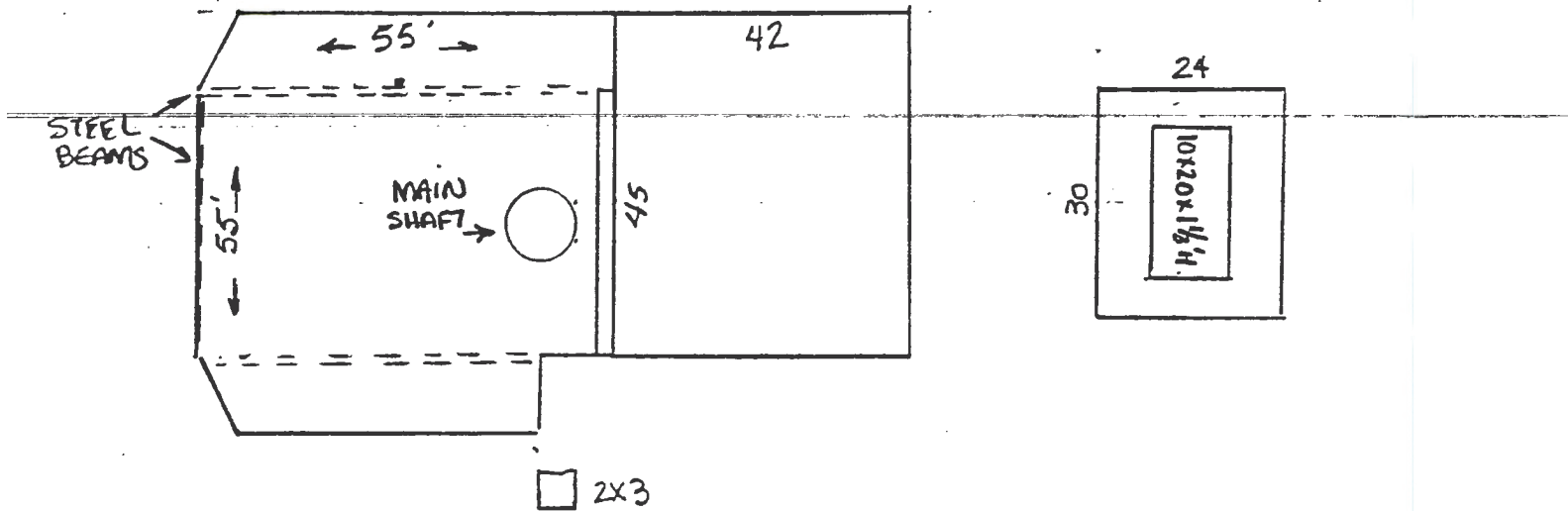
10'

CEMENT SLABS @ SEC 17 Churchrock

Salvador

12-1-94

Pg. 1-OF-3



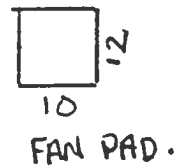
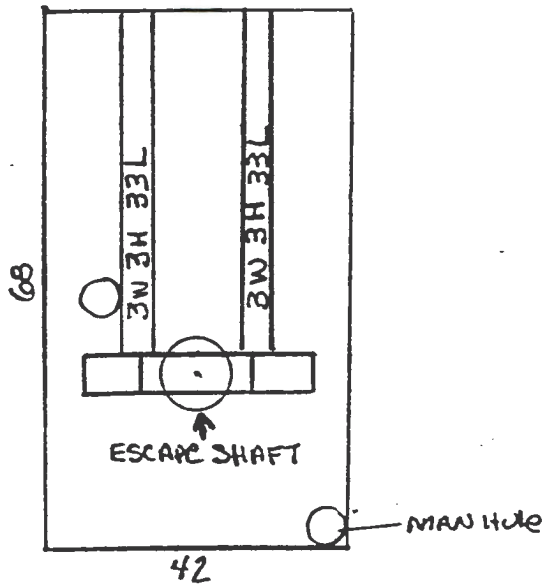
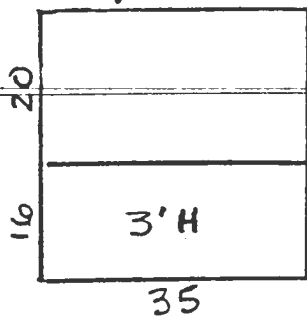
7'x9 SWITCHGEAR PAD

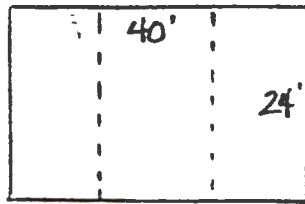
8'x10 SWITCHGEAR PAD

CEMENT SLABS @ SEC 17 Churchralc

Schulder

Pg 2 of 3

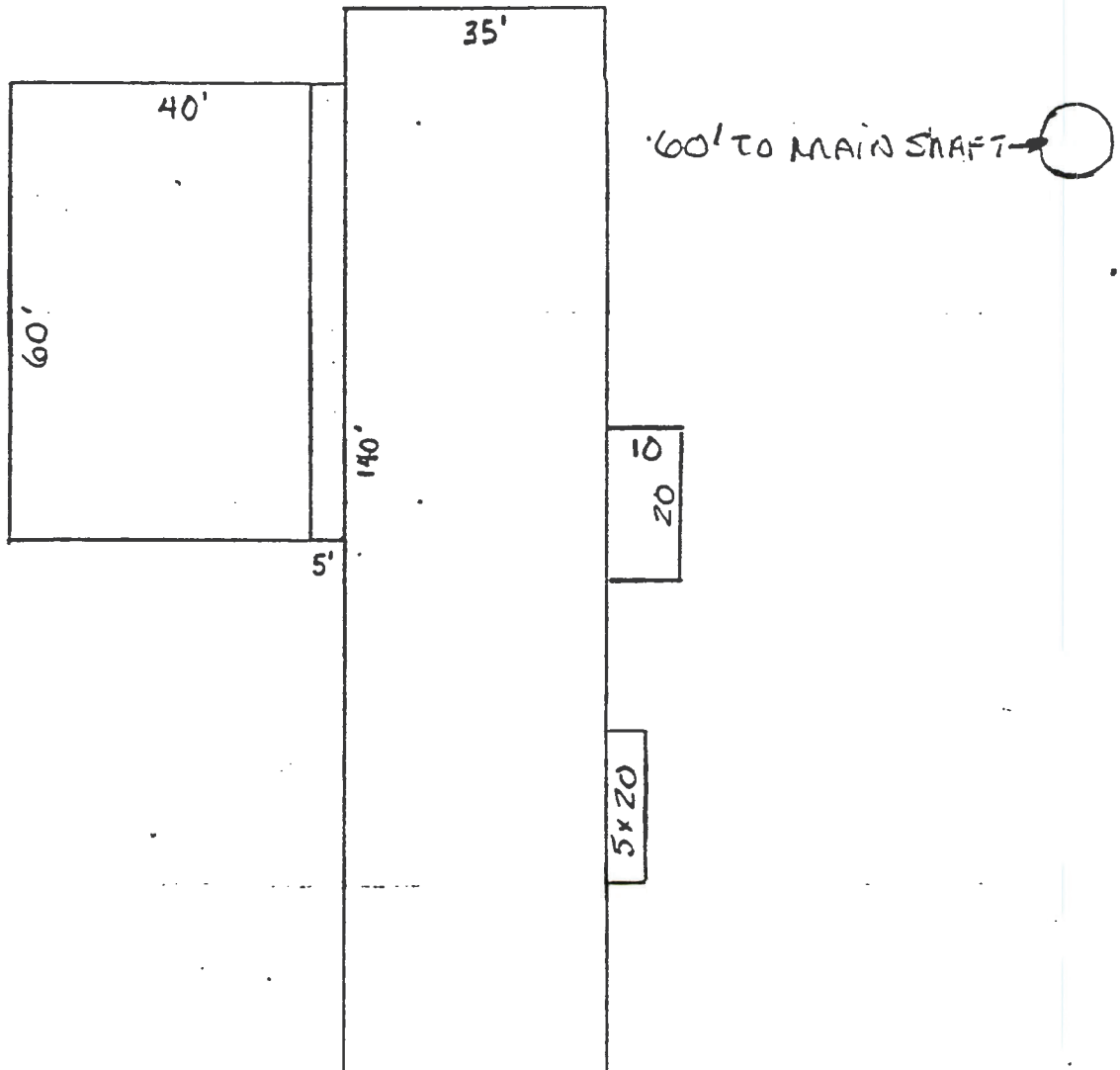
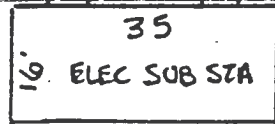
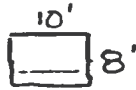




CEMENT SLABS
SEC 17 Churchrock

Salvador
12-1-94

Pg 3 of 3



**ATTACHMENT I-2: 2013 INTERA INVESTIGATION SOIL BORING
LOCATIONS**

DRAFT 2013 PHASE II SITE CHARACTERIZATION REPORT

**Old Church Rock Mine
McKinley County, New Mexico**



Prepared for:

Uranium Resources, Inc.
5041 Indian School Rd. NE
Albuquerque, NM 87110

Prepared by:



INTERA Incorporated
6000 Uptown Boulevard, NE, Suite 220
Albuquerque, New Mexico 87110

August 20, 2013

APPENDIX D
Soil Boring Logs

Log of Boring SB-0-A

Date: 2/4/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/8
 Logged By: L. Dalton
 SCAG Blank (cpm): NA
 Bore Loc Background (cpm): 13165
 Total Depth (ft.): 16
 Total Depth Criterion: NA



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	2.2	SM	Silty SAND, poorly graded, fine-grained sand, non-plastic, loose, light brown, dry, no HCl reaction		1775	NA	
1					1821	NA	
2					1669	NA	
3					1768	NA	
4					1858	NA	
5					-	NA	
6					-	NA	
7	-		NA				
8	2.7		Silty SAND, poorly graded, fine- to medium-grained sand (predominantly fine), subround, non-plastic, loose, light brown, dry, no HCl reaction		1817	NA	
9					1776	NA	
10					1688	NA	
11					1718	NA	
12					1804	NA	
13					-	NA	
14					-	NA	
15	-		NA				
16	2.7		Silty SAND, trace caliche, poorly graded, fine- to medium-grained sand (predominantly fine), subround, non-plastic, loose, light brown, dry, weak HCl reaction		1786	NA	
17					1694	NA	
18					1717	NA	
19					1681	NA	
20		1763		NA			
21		-		NA			
22		-		NA			
23	-	NA					
24	2.5	Silty SAND, poorly graded, fine- to medium-grained sand (predominantly fine), subround, non-plastic, loose, light brown, dry, no HCl reaction	1728	NA			
25			1738	NA			
26			1834	NA			
27			1822	NA			
28			1815	NA			
29			-	NA			
30			-	NA			
31	-	NA					

Notes:

Log of Boring SB-0-B

Date: 2/7/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: L. Dalton
 SCAG Blank (cpm): NA
 Bore Loc Background (cpm): 13165
 Total Depth (ft.): 16
 Total Depth Criterion: NA



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.2	SM	Silty SAND, poorly graded, fine-grained sand, non-plastic, loose, light brown, dry, no HCl reaction		2162	NA	
1					2146	NA	
2					2172	NA	
3					2159	NA	
4					2107	NA	
5					2152	NA	
6					-	NA	
7	-		NA				
8	3.3		Silty SAND, poorly graded, fine- to medium-grained sand (predominantly fine), subround, non-plastic, loose, light brown, dry, no HCl reaction		2135	NA	
9					2265	NA	
10					2032	NA	
11					2110	NA	
12					2164	NA	
13					2121	NA	
14					2109	NA	
15	-		NA				
16	4		Silty SAND, poorly graded, fine- to medium-grained sand (predominantly fine), subround, non-plastic, loose, light brown, dry, no HCl reaction		2024	NA	
17					2226	NA	
18					2152	NA	
19					2017	NA	
20					2093	NA	
21					2046	NA	
22					2266	NA	
23	2025		NA				
24	4		Silty SAND, poorly graded, fine- to medium-grained sand (predominantly fine), subround, non-plastic, loose, light brown, dry, no HCl reaction		2062	NA	
25					2179	NA	
26					2085	NA	
27					2176	NA	
28					2106	NA	
29					2182	NA	
30					2198	NA	
31	2122		NA				

Notes:

Log of Boring SB-0-C

Date: 2/7/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 2
 Logged By: L. Dalton
 SCAG Blank (cpm): NA
 Bore Loc Background (cpm): 13165
 Total Depth (ft.): 16
 Total Depth Criterion: NA



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.4	SM	Silty SAND, poorly graded, fine-grained sand, non-plastic, loose, light brown, dry, no HCl reaction		2496	NA	
1					2467	NA	
2					2522	NA	
3					2507	NA	
4					2403	NA	
5					2351	NA	
6					2431	NA	
7	-		NA				
8	2.7		Silty SAND, poorly graded, fine- to medium-grained sand (predominantly fine), subround, non-plastic, loose, light brown, dry, no HCl reaction		2431	NA	
9					2458	NA	
10					2238	NA	
11					2264	NA	
12					2540	NA	
13					-	NA	
14					-	NA	
15	-		NA				
16	3.5		Silty SAND, poorly graded, fine- to medium-grained sand (predominantly fine), subround, non-plastic, loose, light brown, dry, no HCl reaction		2380	NA	
17					2273	NA	
18					2366	NA	
19					2317	NA	
20					2250	NA	
21					2337	NA	
22					2385	NA	
23	-		NA				
24	3.6		Silty SAND, poorly graded, fine- to medium-grained sand (predominantly fine), subround, non-plastic, loose, light brown, dry, no HCl reaction		2374	NA	
25					2287	NA	
26					2361	NA	
27					2500	NA	
28					2409	NA	
29					2493	NA	
30					2434	NA	
31	-		NA				

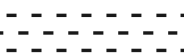
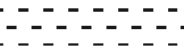
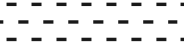

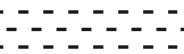
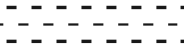

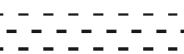
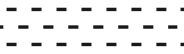
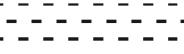

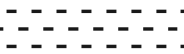
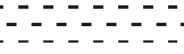

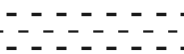
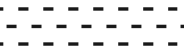
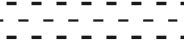

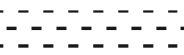
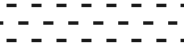

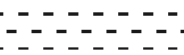
Notes:

Log of Boring SB-01

Date: 2/6/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/8
 Logged By: L. Dalton
 SCAG Blank (cpm): 1540
 Bore Loc Background (cpm): 10139
 Total Depth (ft.): 12
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	1.4	CL	Lean CLAY, trace fine-grained sand, medium plasticity, soft, light brown, dry, weak HCl reaction		1564	24	
1					1548	8	
					-		
2					-		
					-		
3					-		
					-		
4	2.3		Lean CLAY, trace fine-grained sand, medium plasticity, soft, light brown, dry, weak HCl reaction		1517	-23	
5					1512	-28	
					1597	57	
6					1674	134	
					-		
7					-		
					-		
8	2		Lean CLAY, trace fine-grained sand, medium plasticity, soft, light brown, dry, weak HCl reaction		1527	-13	
9					1534	-6	
					1488	-52	
10					1530	-10	
					-		
11					-		
					-		
12						-	

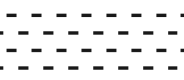




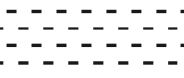

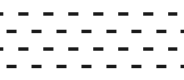






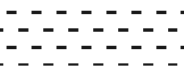

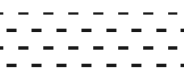
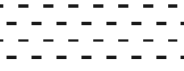
Notes:

Log of Boring SB-02

Date: 2/6/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/8
 Logged By: L. Dalton
 SCAG Blank (cpm): 1635
 Bore Loc Background (cpm): 13269
 Total Depth (ft.): 8
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	1.9	CL	Lean CLAY, fine-grained sand, low plasticity, soft, light brown, dry, weak HCl reaction		1623	-12	
0.4					1595	-40	
0.8					1589	-46	
1.2					1662	27	
1.6					-		
2					-		
2.4					-		
2.8					-		
3.2			-				
3.6			-				
4	2.5		Lean CLAY, trace fine-grained sand, medium plasticity, soft, light brown, dry, weak HCl reaction		1618	-17	
4.4					1704	69	
4.8					1625	-10	
5.2					1564	-71	
5.6					1594	-41	
6					-		
6.4				-			
6.8				-			
7.2							
7.6							

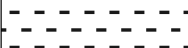

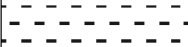


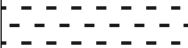
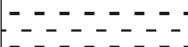

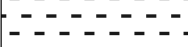
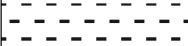



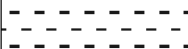
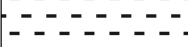
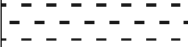
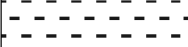
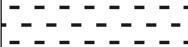


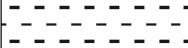
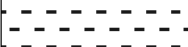

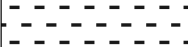
Notes:

Log of Boring SB-03

Date: 2/8/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: L. Dalton
 SCAG Blank (cpm): 1881
 Bore Loc Background (cpm): 12640
 Total Depth (ft.): 12
 Total Depth Criterion: Stability



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	4	CL	Lean CLAY, few fine-grained sand, low plasticity, soft, brown, dry, weak HCl reaction		1909	28	15.1395
					1879	-2	14.7735
1					2033	152	16.6523
					2046	165	16.8109
2					1999	118	16.2375
					1989	108	16.1155
3					1935	54	15.4567
			1909	28	15.1395		
4	3.6		Lean CLAY, trace fine-grained sand, medium plasticity, firm, brown, dry, weak HCl reaction, trace fine white sand stringers		1877	-4	14.7491
					2023	142	16.5303
5					2040	159	16.7377
					2072	191	17.1281
6					2098	217	17.4453
					2016	135	16.4449
7					1974	93	15.9325
			-				
8	4		Lean CLAY, trace fine-grained sand, medium plasticity, hard, brown, dry, strong HCl reaction, trace fine white sand stringers		2152	271	18.1041
					1939	58	15.5055
9					2046	165	16.8109
					2028	147	16.5913
10					2022	141	16.5181
					2110	229	17.5917
11					2080	199	17.2257
			2113	232	17.6283		
12							

Notes:

Log of Boring SB-04

Date: 2/7/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: L. Dalton
 SCAG Blank (cpm): 2250
 Bore Loc Background (cpm): 16123
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	2.9	CL	Sandy CLAY, fine-grained sand, low plasticity, soft, brown, dry, strong HCl reaction		2266	16	14.9931
0.2							
0.4							
0.6							
0.8					2373	123	16.2985
1							
1.2							
1.4					2698	448	20.2635
1.6							
1.8					2276	26	15.1151
2							
2.2					2189	-61	14.0537
2.4							
2.6							
2.8					2146	-104	13.5291
3							
3.2					-		
3.4							
3.6							
3.8					-		

Notes:

Log of Boring SB-05

Date: 2/8/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: L. Dalton
 SCAG Blank (cpm): 1980
 Bore Loc Background (cpm): 14839
 Total Depth (ft.): 8
 Total Depth Criterion: Stability



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	4	CL	Lean CLAY, trace fine-grained sand, low to medium plasticity, soft, brown, dry, weak HCl reaction, trace fine white sand stringers		2101	121	16.2741
0.4					2196	216	17.4331
0.8					2133	153	16.6645
1.2					2156	176	16.9451
1.6					2197	217	17.4453
2					2039	59	15.5177
2.4					2201	221	17.4941
2.8					2036	56	15.4811
3.2	3.3	CL	Lean CLAY, trace fine-grained sand, low to medium plasticity, soft, brown, dry, strong HCl reaction, trace charcoal		2062	82	15.7983
3.6					2111	131	16.3961
4					2030	50	15.4079
4.4					2051	71	15.6641
4.8					2080	100	16.0179
5.2					2098	118	16.2375
5.6					-		
6					-		
6.4							
6.8							
7.2							
7.6							

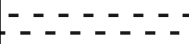



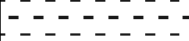

Notes:

Log of Boring SB-06

Date: 2/6/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/8
 Logged By: L. Dalton
 SCAG Blank (cpm): 1796
 Bore Loc Background (cpm): 13757
 Total Depth (ft.): 20
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	1.1	CL	Lean CLAY, trace fine-grained sand, low to medium plasticity, soft, light brown, dry, weak HCl reaction		1776	-20	
1					1889	93	
2					-		
3					-		
4					-		
5	1.5		Lean CLAY, trace fine-grained sand, low to medium plasticity, soft, light brown, dry, weak HCl reaction		1756	-40	
6					1824	28	
7					1887	91	
8					-		
9					-		
10	1.5		Lean CLAY, trace fine-grained sand, low to medium plasticity, soft, light brown and moderate gray, dry, weak HCl reaction		1835	39	
11					1808	12	
12					-		
13					-		
14					-		
15	2		Lean CLAY, trace fine-grained sand, low to medium plasticity, soft, light brown and moderate gray, dry, weak HCl reaction		1785	-11	
16					1858	62	
17					1922	126	
18					1865	69	
19					-		
20	2.8		Lean CLAY, trace fine-grained sand, low to medium plasticity, soft, light brown and moderate gray, dry, weak HCl reaction		1798	2	
21					1818	22	
22					1821	25	
23					1771	-25	
24					1744	-52	
25			Lean CLAY with Sand, fine-grained sand, low plasticity, firm, light brown, dry, strong HCl reaction		-		
26					-		
27					-		

Notes:

Log of Boring SB-07

Date: 2/8/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: L. Dalton
 SCAG Blank (cpm): 2098
 Bore Loc Background (cpm): 14102
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.3	CL	Lean CLAY, trace fine-grained sand, low plasticity, soft, brown, dry, weak HCl reaction, roots		-		
0.2							
0.4		SW	Well Graded SAND, fine- to coarse-grained sand (predominantly fine to medium), subangular to subround, loose, light brown, dry, no HCl reaction, weakly cemented		2043	-55	14.1269
0.6							
0.8							
1							
1.2					2179	81	15.7861
1.4							
1.6							
1.8					2088	-10	14.6759
2							
2.2					1930	-168	12.7483
2.4		SW	Well Graded SAND, fine- to coarse-grained sand (predominantly fine to medium), subangular to subround, loose, light brown, dry, no HCl reaction, weakly cemented				
2.6					1991	-107	13.4925
2.8							
3							
3.2					1964	-134	13.1631
3.4							
3.6							
3.8					-		

Notes:

Log of Boring SB-08

Date: 2/6/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/8
 Logged By: L. Dalton
 SCAG Blank (cpm): 1953
 Bore Loc Background (cpm): 21926
 Total Depth (ft.): 24
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	1.6	ML	Clayey SILT, low plasticity, soft, brown, moist	.....	2087	134	
				.....	2460	507	
				.....	2113	160	
				-		
2	1.6	SP	Poorly Graded SAND, few silt, fine-grained sand, non-plastic, loose, light brown, dry, weak HCl reaction	.....	-	
				-		
				-		
				-		
4	1.2		Lean CLAY, few fine-grained sand, low to medium plasticity, soft, light brown, dry, strong HCl reaction	.....	2268	315	
				.....	2086	133	
				-		
				-		
6	1.2		Lean CLAY, few fine-grained sand, low to medium plasticity, soft, light brown, dry, strong HCl reaction	.....	-	
				-		
				-		
				-		
8	0.7		Lean CLAY, few fine-grained sand, low to medium plasticity, soft, light brown, dry, strong HCl reaction	.....	1985	32	
				-		
				-		
				-		
10	0.7		Lean CLAY, few fine-grained sand, low to medium plasticity, soft, light brown, dry, strong HCl reaction	.....	-	
				-		
				-		
				-		
12	1.5	CL	Lean CLAY, trace fine-grained sand, medium plasticity, soft, light brown, dry, weak HCl reaction	.....	-	
				.....	1916	-37	
				.....	2000	47	
				.....	2013	60	
14	1.5		Lean CLAY, trace fine-grained sand, medium plasticity, soft, light brown, dry, weak HCl reaction	.....	-	
				-		
				-		
				-		
16	4		Lean CLAY, trace fine-grained sand, medium plasticity, soft, light brown, dry, weak HCl reaction	.....	-	217	
				.....	2170	129	
				.....	2082	163	
				.....	2116	252	
18	4		Lean CLAY, trace fine-grained sand, medium plasticity, soft, light brown, dry, weak HCl reaction	.....	2205	-23	
				.....	1930	11	
				.....	1964	86	
				.....	2039	132	
20	3.5		Lean CLAY, trace fine-grained sand, medium plasticity, soft, light brown, dry, weak HCl reaction	.....	2085	56	
				.....	2009	103	
				.....	2056	34	
				.....	1987	31	
22	3.5		Lean CLAY, trace fine-grained sand, medium plasticity, soft, light brown, dry, weak HCl reaction	.....	1984	31	
				.....	1984	-50	
				.....	1903	-11	
				.....	1942		
24							

Notes:

Log of Boring SB-09

Date: 2/8/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: L. Dalton
 SCAG Blank (cpm): 2015
 Bore Loc Background (cpm): NM
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.2	CL	Lean CLAY, trace fine-grained sand, low to medium plasticity, soft, brown, dry, weak HCl reaction		1999	-16	14.6027
0.2							
0.4		ML	SILT, trace fine-grained sand, low plasticity, soft, light brown, dry, strong HCl reaction		1995	-20	14.5539
0.6							
0.8							
1							
1.2					1862	-153	12.9313
1.4							
1.6							
1.8					1795	-220	12.1139
2							
2.2					1968	-47	14.2245
2.4		ML	SILT, trace fine-grained sand, low plasticity, soft, light brown, dry, strong HCl reaction				
2.6							
2.8					1839	-176	12.6507
3							
3.2					-		
3.4							
3.6							
3.8					-		

Notes:

Log of Boring SB-10

Date: 2/6/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/8
 Logged By: L. Dalton
 SCAG Blank (cpm): 1760
 Bore Loc Background (cpm): 12056
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	1	CL	Lean CLAY, trace fine-grained sand, low to medium plasticity, soft, light brown, dry, no HCl reaction		1647	-113	
0.2							
0.4							
0.6							
0.8					1647	-113	
1							
1.2					-		
1.4							
1.6					-		
1.8							
2							
2.2					-		
2.4							
2.6					-		
2.8							
3					-		
3.2							
3.4					-		
3.6							
3.8					-		

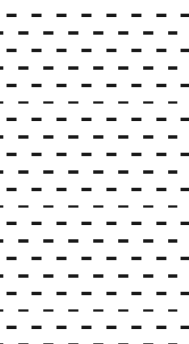
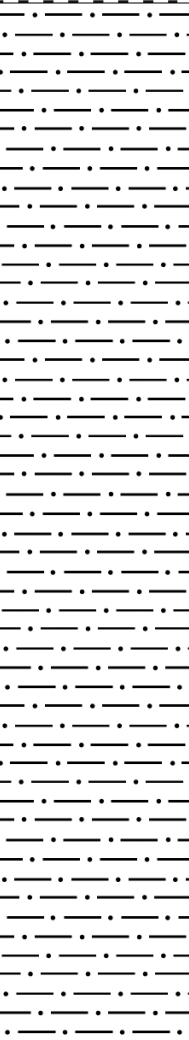
Notes:

Log of Boring SB-11

Date: 2/8/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: L. Dalton
 SCAG Blank (cpm): 1915
 Bore Loc Background (cpm): NM
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.4	CL	Lean CLAY, trace fine-grained sand, low to medium plasticity, brown, soft, dry, weak HCl reaction		1910	-5	14.7369
0.2					2004	89	15.8837
0.4							
0.6							
0.8		ML	Sandy SILT, fine-grained sand, non-plastic, soft, light brown, dry, weak HCl reaction, trace charcoal		1939	24	15.0907
1					1904	-11	14.6637
1.2							
1.4					1899	-16	14.6027
1.6							
1.8					1996	81	15.7861
2							
2.2					1817	-98	13.6023
2.4							
2.6					-		
2.8							
3							
3.2							
3.4							
3.6							
3.8							

Notes:

Log of Boring SB-12

Date: 2/6/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/8
 Logged By: L. Dalton
 SCAG Blank (cpm): 1756
 Bore Loc Background (cpm): 15144
 Total Depth (ft.): 8
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	1	CL	Lean CLAY, few silt, trace fine-grained sand, low plasticity, soft, light brown, dry, no HCl reaction		1694	-62	
0.4					1923	167	
0.8					-		
1.2					-		
1.6					-		
2					-		
2.4					-		
2.8					-		
3.2	1.2	CL	Lean CLAY, trace silt, trace caliche, low plasticity, soft, light brown, dry, strong HCl reaction		-		
3.6					-		
4					1677	-79	
4.4					1687	-69	
4.8					-		
5.2					-		
5.6					-		
6					-		
6.4					-		
6.8					-		
7.2					-		
7.6					-		

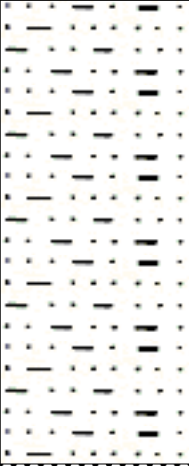
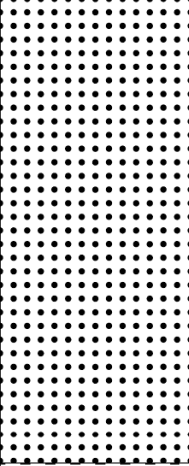
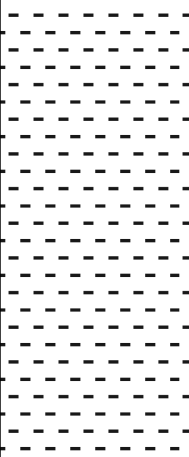
Notes:

Log of Boring SB-13

Date: 2/5/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/8
 Logged By: L. Dalton
 SCAG Blank (cpm): 1625
 Bore Loc Background (cpm): 13290
 Total Depth (ft.): 12
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	1.4	SM	Silty SAND, poorly graded, fine-grained sand, non-plastic, loose, light brown, dry, strong HCl reaction		1537	-88	
					1584	-41	
1					-		
					-		
2					-		
					-		
3					-		
4	2.1	SW	Well Graded SAND, trace silt, fine- to coarse-grained sand (predominantly fine to medium), loose, light brown, dry, strong HCl reaction		1565	-60	
					1458	-167	
5					1518	-107	
					1523	-102	
6					-		
					-		
7					-		
8	0.8	CL	Lean CLAY, few fine-grained sand, medium plasticity, soft, olive-brown, dry, strong HCl reaction		1589	-36	
					1545	-80	
9					-		
					-		
10					-		
					-		
11					-		
12					-		

Notes:

Log of Boring SB-14

Date: 2/5/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/8
 Logged By: L. Dalton
 SCAG Blank (cpm): 1625
 Bore Loc Background (cpm): 10405
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	1.4	SM	Silty SAND, poorly graded, fine to medium-grained sand, subangular to subround, non-plastic, loose, light brown, dry, strong HCl reaction		1569	-56	
0.2							
0.4							
0.6							
0.8					1556	-69	
1							
1.2					-		
1.4							
1.6					-		
1.8							
2					-		
2.2							
2.4					-		
2.6							
2.8					-		
3							
3.2					-		
3.4							
3.6					-		
3.8							

Notes:

Log of Boring SB-15

Date: 2/5/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/8
 Logged By: L. Dalton
 SCAG Blank (cpm): 1625
 Bore Loc Background (cpm): 20308
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	1.5	ML	Sandy SILT, fine-grained sand, low to medium plasticity, soft, light brown, dry, no HCl reaction		1688	63	
0.2							
0.4							
0.6							
0.8					1628	3	
1							
1.2					1531	-94	
1.4							
1.6							
1.8					-		
2							
2.2					-		
2.4							
2.6							
2.8					-		
3							
3.2					-		
3.4							
3.6							
3.8					-		






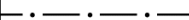


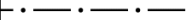


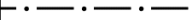
















Notes:

Log of Boring SB-16

Date: 2/5/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/8
 Logged By: L. Dalton
 SCAG Blank (cpm): 1625
 Bore Loc Background (cpm): 12046
 Total Depth (ft.): 16
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	1.4	ML	Sandy SILT, fine-grained sand, low to medium plasticity, soft to firm, light brown, dry, no HCl reaction		1706	81	
1					1597	-28	
					1685	60	
2					-		
					-		
3			-				
			-				
4	0.5		Sandy SILT, fine-grained sand, low to medium plasticity, hard, light brown, dry, strong HCl reaction, caliche, (Harder drilling ~3.5'-5')		1527	-98	
5					-		
	0.6		Sandy SILT, fine-grained sand (increased %), low to medium plasticity, soft to firm, light brown, dry, strong HCl reaction, caliche (decreased %)		1589	-36	
6					-		
					-		
7					-		
					-		
8	0.8		SC	Sandy CLAY, fine-grained sand, medium plasticity, firm, brown, dry, strong HCl reaction		1624	-1
9					-		
					-		
10					-		
					-		
11					-		
					-		
12	1.1	SM	Silty SAND, poorly graded, fine-grained sand, non-plastic, medium dense, light brown, dry, weak HCl reaction		1521	-104	
13					-		
					-		
14					-		
					-		
15					-		
					-		
16							

Notes:

Log of Boring SB-17

Date: 2/5/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/8
 Logged By: L. Dalton
 SCAG Blank (cpm): 1625
 Bore Loc Background (cpm): 19119
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	1.4	ML	Sandy SILT, fine-grained sand, low to medium plasticity, soft, light brown, dry, no HCl reaction		1625	0	
0.2							
0.4							
0.6							
0.8					1585	-40	
1							
1.2					-		
1.4							
1.6					-		
1.8							
2					-		
2.2							
2.4					-		
2.6							
2.8					-		
3							
3.2					-		
3.4							
3.6					-		
3.8							

Notes:

Log of Boring SB-18

Date: 2/16/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2024
 Bore Loc Background (cpm): 10360
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.2	SM	Moist Clay, Silt & Sand surface material		1922	-102	13.5535
0.2							
0.4		SC	Clayey SAND, poorly graded, fine-grained sand, loose, light brown		1983	-41	14.2977
0.6							
0.8							
1							
1.2					2069	45	15.3469
1.4							
1.6					2135	111	16.1521
1.8							
2					2085	61	15.5421
2.2							
2.4					2018	-6	14.7247
2.6							
2.8							
3							
3.2					-		
3.4							
3.6							
3.8					-		

Notes:

Log of Boring SB-19

Date: 2/5/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/8
 Logged By: L. Dalton
 SCAG Blank (cpm): 1625
 Bore Loc Background (cpm): 13898
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	1.3	ML	Sandy SILT, fine-grained sand, low to medium plasticity, soft, light brown, dry, no HCl reaction		1686	61	
0.2							
0.4							
0.6							
0.8					1579	-46	
1							
1.2					-		
1.4							
1.6					-		
1.8							
2							
2.2					-		
2.4							
2.6					-		
2.8							
3							
3.2					-		
3.4							
3.6					-		
3.8							

Notes:

Log of Boring SB-20

Date: 2/15/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2146
 Bore Loc Background (cpm): 16281
 Total Depth (ft.): 8
 Total Depth Criterion: Stability



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.8	SM	Moist Clay, Silt & Sand surface material		2195	49	15.3957
0.4					2200	54	15.4567
0.8					2073	-73	13.9073
1.2			Dry Clay, Silt & Sand surface material		2150	4	14.8467
1.6					2185	39	15.2737
2					2248	102	16.0423
2.4		CL	Lean CLAY with Caliche, medium plasticity, hard, tan and gray with white caliche streaks, dry, no HCl reaction (clay), strong HCl reaction (caliche)		2284	138	16.4815
2.8					-		
3.2							
3.6							
4	3.8	SP	Poorly Graded SAND with Silt, fine-grained sand, loose, light brown, dry, no HCl reaction		2325	179	16.9817
4.4					2334	188	17.0915
4.8					2220	74	15.7007
5.2					2327	181	17.0061
5.6					2270	124	16.3107
6					2185	39	15.2737
6.4					2198	52	15.4323
6.8					-		
7.2							
7.6							

Notes:

Log of Boring SB-21

Date: 2/15/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2569
 Bore Loc Background (cpm): 13359
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.5	SP	Poorly Graded SAND with Silt, fine-grained sand, loose, light brown, dry, strong HCl reaction		3082	513	21.0565
0.2							
0.4							
0.6							
0.8					2597	28	15.1395
1							
1.2							
1.4					2466	-103	13.5413
1.6							
1.8					2394	-175	12.6629
2	3.5	SP	Poorly Graded SAND with Silt, fine-grained sand, loose, light brown, dry, strong HCl reaction				
2.2					2384	-185	12.5409
2.4							
2.6							
2.8					2597	28	15.1395
3							
3.2					2439	-130	13.2119
3.4	3.5	SP	Poorly Graded SAND with Silt, fine-grained sand, loose, light brown, dry, strong HCl reaction				
3.6							
3.8					-		

Notes:

Log of Boring SB-22

Date: 2/15/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2173
 Bore Loc Background (cpm): 16966
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	2.9	SM	Moist Clay, Silt & Sand surface material		2011	-162	12.8215
0.2							
0.4		SP	Poorly Graded SAND with Silt, fine-grained sand, loose to medium dense, light brown, dry, no HCl reaction		1970	-203	12.3213
0.6							
0.8							
1							
1.2					2094	-79	13.8341
1.4							
1.6					1964	-209	12.2481
1.8							
2							
2.2					2010	-163	12.8093
2.4		SP	Poorly Graded SAND with Silt, fine-grained sand, loose to medium dense, light brown, dry, no HCl reaction				
2.6					2033	-140	13.0899
2.8							
3							
3.2					-		
3.4							
3.6							
3.8							

Notes:

Log of Boring SB-23

Date: 2/4/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/8
 Logged By: L. Dalton
 SCAG Blank (cpm): 1625
 Bore Loc Background (cpm): 12768
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	1.2	CL	Lean CLAY, trace fine-grained sand, low to medium plasticity, soft, light brown, dry, no HCl reaction		1601	-24	
0.2							
0.4							
0.6							
0.8					1619	-6	
1							
1.2					-		
1.4							
1.6					-		
1.8							
2							
2.2					-		
2.4							
2.6					-		
2.8							
3					-		
3.2							
3.4					-		
3.6							
3.8					-		

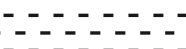
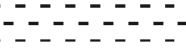

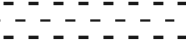


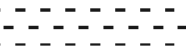















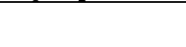
Notes:

Log of Boring SB-24

Date: 2/15/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2372
 Bore Loc Background (cpm): 12086
 Total Depth (ft.): 12
 Total Depth Criterion: Stability



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.8	CL	Lean CLAY with Sand, fine-grained sand, low plasticity, firm, light brown, dry, weak HCl reaction		2407	35	15.2249
1					2394	22	15.0663
					2523	151	16.6401
2					2507	135	16.4449
					2527	155	16.6889
3					2639	267	18.0553
					2400	28	15.1395
4							-
5	3.3	SP	Poorly Graded SAND with Silt, fine-grained sand, loose, light brown, dry		2360	-12	14.6515
					2446	74	15.7007
6					2378	6	14.8711
					2427	55	15.4689
7					2379	7	14.8833
					2410	38	15.2615
8					-		
					-		
9	3.7				2327	-45	14.2489
					2436	64	15.5787
10					2344	-28	14.4563
					2371	-1	14.7857
11					2341	-31	14.4197
					2476	104	16.0667
12					2482	110	16.1399
					-		

Notes:

Log of Boring SB-25

Date: 2/15/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2318
 Bore Loc Background (cpm): 14794
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.5	SM	Moist Clay, Silt & Sand surface material		2734	416	19.8731
0.2					2401	83	15.8105
0.4					2286	-32	14.4075
0.6	3.5	SP	Poorly Graded SAND with Silt, fine-grained sand, medium dense, light brown, dry, weak HCl reaction		2310	-8	14.7003
0.8					2263	-55	14.1269
1					2342	24	15.0907
1.2					2277	-41	14.2977
1.4					-		
1.6							
1.8							
2	3.5	SP	Poorly Graded SAND with Silt, fine-grained sand, medium dense, light brown, dry, weak HCl reaction		2342	24	15.0907
2.2					2277	-41	14.2977
2.4					-		
2.6							
2.8							
3							
3.2							
3.4	3.5	SP	Poorly Graded SAND with Silt, fine-grained sand, medium dense, light brown, dry, weak HCl reaction				
3.6							
3.8							

Notes:

Log of Boring SB-26

Date: 2/15/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2648
 Bore Loc Background (cpm): 11817
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.6	SP	Poorly Graded SAND with Silt, fine-grained sand, loose, light brown, dry, no HCl reaction		2041	-607	7.3925
0.2					2167	-481	8.9297
0.4					2278	-370	10.2839
0.6					2376	-272	11.4795
0.8					2294	-354	10.4791
1					2172	-476	8.9907
1.2					2264	-384	10.1131
1.4					-		
1.6							
1.8							
2							
2.2							
2.4							
2.6							
2.8							
3							
3.2							
3.4							
3.6							
3.8							

Notes:

Log of Boring SB-27

Date: 2/15/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2208
 Bore Loc Background (cpm): 17067
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0		SM	Moist Clay, Silt & Sand surface material		2308	100	16.0179
0.2							
0.4	3.4	SP	Poorly Graded SAND with Silt, fine-grained sand, low plasticity, very loose to loose, light brown, dry		2243	35	15.2249
0.6							
0.8							
1							
1.2					2277	69	15.6397
1.4							
1.6							
1.8					2357	149	16.6157
2							
2.2					2169	-39	14.3221
2.4							
2.6							
2.8					2286	78	15.7495
3							
3.2					2175	-33	14.3953
3.4							
3.6							
3.8					-		

Notes:

Log of Boring SB-28

Date: 2/4/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/8
 Logged By: L. Dalton
 SCAG Blank (cpm): 1625
 Bore Loc Background (cpm): 13918
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	1.3	CL	Lean CLAY, trace fine-grained sand, low to medium plasticity, soft, light brown, dry, no HCl reaction				
0.2					1573	-52	
0.4							
0.6							
0.8					1606	-19	
1							
1.2					-		
1.4							
1.6					-		
1.8							
2	1.3	CL	Lean CLAY, trace fine-grained sand, low to medium plasticity, soft, light brown, dry, no HCl reaction				
2.2					-		
2.4							
2.6					-		
2.8							
3					-		
3.2							
3.4					-		
3.6	1.3	CL	Lean CLAY, trace fine-grained sand, low to medium plasticity, soft, light brown, dry, no HCl reaction				
3.8					-		

Notes:

Log of Boring SB-29

Date: 2/15/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2546
 Bore Loc Background (cpm): 106174
 Total Depth (ft.): 8
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.5	SM	Moist Clay, Silt & Sand surface material		7296	4750	72.7479
0.4					7977	5431	81.0561
0.8					3121	575	21.8129
1.2	3.6	SP	Poorly Graded SAND with Silt, fine-grained sand, loose, light brown, dry		2755	209	17.3477
1.6					2561	15	14.9809
2					2593	47	15.3713
2.4					2600	54	15.4567
2.8					-		
3.2					2758	212	17.3843
3.6					2513	-33	14.3953
4					2531	-15	14.6149
4.4					2385	-161	12.8337
4.8					2436	-110	13.4559
5.2					2533	-13	14.6393
5.6					2478	-68	13.9683
6					-		
6.4							
6.8							
7.2							
7.6							

Notes:

Log of Boring SB-30

Date: 2/15/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2306
 Bore Loc Background (cpm): 17701
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.4	SP	Poorly Graded SAND with Silt, fine-grained sand, very loose, light brown, dry, weak HCl reaction		2344	38	15.2615
0.2					2225	-81	13.8097
0.4					2367	61	15.5421
0.6					2294	-12	14.6515
0.8					2356	50	15.4079
1					2278	-28	14.4563
1.2					2235	-71	13.9317
1.4					-		
1.6							
1.8							
2							
2.2							
2.4							
2.6							
2.8							
3							
3.2							
3.4							
3.6							
3.8							

Notes:

Log of Boring SB-31

Date: 2/15/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2380
 Bore Loc Background (cpm): 16770
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.5	SP	Poorly Graded SAND with Silt, fine-grained sand, very loose, light brown, dry, no HCl reaction		2289	-91	13.6877
0.2					2332	-48	14.2123
0.4					2419	39	15.2737
0.6					2292	-88	13.7243
0.8					2216	-164	12.7971
1					2276	-104	13.5291
1.2					2374	-6	14.7247
1.4					-		
1.6							
1.8							
2							
2.2							
2.4							
2.6							
2.8							
3							
3.2							
3.4							
3.6							
3.8							

Notes:

Log of Boring SB-32

Date: 2/15/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2208
 Bore Loc Background (cpm): 15314
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.2	SM	Moist Clay, Silt & Sand surface material		2094	-114	13.4071
0.2					2146	-62	14.0415
0.4					2301	93	15.9325
0.6					2215	7	14.8833
0.8	3.2	SP	Poorly Graded SAND with Silt, fine-grained sand, very loose-loose, light brown, dry		2275	67	15.6153
1					2018	-190	12.4799
1.2					-		
1.4					-		
1.6							
1.8							
2							
2.2							
2.4							
2.6							
2.8							
3							
3.2							
3.4							
3.6							
3.8							

Notes:

Log of Boring SB-33

Date: 2/14/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 1936
 Bore Loc Background (cpm): NM
 Total Depth (ft.): 8
 Total Depth Criterion: Stability



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3	CL	Lean CLAY, few fine-grained sand, medium plasticity, soft to firm, tan to light brown, dry		1996	60	15.5299
0.4					2112	176	16.9451
0.8					2219	283	18.2505
1.2					2050	114	16.1887
1.6					2050	114	16.1887
2					2052	116	16.2131
2.4					-		
2.8					-		
3.2	3.1	ML	SILT with Sand, low plasticity, soft to firm, light brown, dry		2078	142	16.5303
3.6					2175	239	17.7137
4					2127	191	17.1281
4.4					2128	192	17.1403
4.8					2123	187	17.0793
5.2					2089	153	16.6645
5.6					-		
6					-		
6.4							
6.8							
7.2							
7.6							

Notes:

Log of Boring SB-34

Date: 2/15/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2212
 Bore Loc Background (cpm): 17747
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.3	SM	Moist Clay, Silt & Sand surface material		2332	120	16.2619
0.2					2263	51	15.4201
0.4		SP	Poorly Graded SAND with Clay, few silt, fine-grained sand, low plasticity, medium dense, light brown, dry		2219	7	14.8833
0.6					2229	17	15.0053
0.8					2164	-48	14.2123
1					2240	28	15.1395
1.2					2201	-11	14.6637
1.4					-		
1.6							
1.8							
2							
2.2							
2.4							
2.6							
2.8							
3							
3.2							
3.4							
3.6							
3.8							

Notes:

Log of Boring SB-35

Date: 2/15/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2212
 Bore Loc Background (cpm): 15291
 Total Depth (ft.): 8
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3	SP	Poorly Graded SAND with Silt, fine-grained sand, loose-medium dense, light brown, dry, weak HCl reaction		2196	-16	14.6027
0.4					2283	71	15.6641
0.8					2197	-15	14.6149
1.2					2300	88	15.8715
1.6					2281	69	15.6397
2					2322	110	16.1399
2.4					-		
2.8	3.5				-		
3.2					2228	16	14.9931
3.6					2371	159	16.7377
4					2302	90	15.8959
4.4					2217	5	14.8589
4.8					2251	39	15.2737
5.2					2202	-10	14.6759
5.6					2200	-12	14.6515
6					-		
6.4							
6.8							
7.2							
7.6							

Notes:

Log of Boring SB-36

Date: 2/16/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 3787
 Bore Loc Background (cpm): 19255
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0		SM	Moist Clay, Silt & Sand surface material		3647	-140	13.0899
0.2							
0.4	3.1	SP	Poorly Graded SAND with Silt, fine-grained sand, medium dense, light brown, dry, weak HCl reaction		3569	-218	12.1383
0.6							
0.8							
1							
1.2					3693	-94	13.6511
1.4							
1.6							
1.8					3764	-23	14.5173
2							
2.2					3848	61	15.5421
2.4							
2.6							
2.8					3753	-34	14.3831
3							
3.2					-		
3.4							
3.6							
3.8					-		

Notes:

Log of Boring SB-37

Date: 2/16/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 7065
 Bore Loc Background (cpm): 29214
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.5	SM	Moist Clay, Silt & Sand surface material		7169	104	16.0667
0.2							
0.4		SP	Poorly Graded SAND with Silt, fine-grained sand, very loose to loose, light brown, dry		7187	122	16.2863
0.6							
0.8							
1							
1.2					6614	-451	9.2957
1.4							
1.6							
1.8					6775	-290	11.2599
2							
2.2					6612	-453	9.2713
2.4							
2.6							
2.8					6750	-315	10.9549
3							
3.2					6836	-229	12.0041
3.4							
3.6							
3.8					-		

Notes:

Log of Boring SB-38

Date: 2/14/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 4466
 Bore Loc Background (cpm): 196780
 Total Depth (ft.): 8
 Total Depth Criterion: Stability



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.4	CL	Moist Clayey surface material		9030	4564	70.4787
0.4					5293	827	24.8873
0.8					4779	313	18.6165
1.2	3.4	CL/M L	Lean CLAY with Sand and Silt, fine-grained sand, low plasticity, soft, light brown, dry		4736	270	18.0919
1.6					4507	41	15.2981
2					4649	183	17.0305
2.4					-		
2.8					-		
3.2					4652	186	17.0671
3.6					4560	94	15.9447
4					4383	-83	13.7853
4.4					4403	-63	14.0293
4.8					4402	-64	14.0171
5.2	3.5				4438	-28	14.4563
5.6					4564	98	15.9935
6					-		
6.4							
6.8							
7.2							
7.6							

Notes:

Log of Boring SB-39

Date: 2/14/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2409
 Bore Loc Background (cpm): 12559
 Total Depth (ft.): 8
 Total Depth Criterion: Stability



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	2.9	SM	Silty SAND, poorly graded, fine- to medium-grained sand, loose, light brown, dry		2443	34	15.2127
0.4					2389	-20	14.5539
0.8					2412	3	14.8345
1.2					2452	43	15.3225
1.6					2538	129	16.3717
2					2466	57	15.4933
2.4					-		
2.8					-		
3.2	3.2	CL	Lean CLAY with Sand, fine-grained sand, low plasticity, firm, light brown, dry		2406	-3	14.7613
3.6					2363	-46	14.2367
4					2445	36	15.2371
4.4					2411	2	14.8223
4.8					2437	28	15.1395
5.2					2457	48	15.3835
5.6					-		
6					-		
6.4							
6.8							
7.2							
7.6							

Notes:

Log of Boring SB-40

Date: 2/14/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2079
 Bore Loc Background (cpm): 13622
 Total Depth (ft.): 8
 Total Depth Criterion: Stability



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.4	SM	Silty SAND, poorly graded, fine-grained sand, medium dense, light brown, dry, some white caliche streaks		2128	49	15.3957
0.4					2273	194	17.1647
0.8					2260	181	17.0061
1.2					2146	67	15.6153
1.6					2192	113	16.1765
2					2226	147	16.5913
2.4					2152	73	15.6885
2.8					-		
3.2	3	SP	Poorly Graded SAND with Silt, fine-grained sand, medium dense, light brown, dry		2088	9	14.9077
3.6					2199	120	16.2619
4					2254	175	16.9329
4.4					2126	47	15.3713
4.8					2207	128	16.3595
5.2					2155	76	15.7251
5.6					-		
6					-		
6.4							
6.8							
7.2							
7.6							

Notes:

Log of Boring SB-41

Date: 2/4/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/8
 Logged By: L. Dalton
 SCAG Blank (cpm): 1625
 Bore Loc Background (cpm): 13670
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	1.8	CL	Lean CLAY, low to medium plasticity, soft, light brown, dry, no HCl reaction				
0.2					1515	-110	
0.4							
0.6							
0.8					1609	-16	
1							
1.2					1630	5	
1.4							
1.6					-		
1.8							
2							
2.2					-		
2.4							
2.6							
2.8					-		
3							
3.2					-		
3.4							
3.6							
3.8					-		

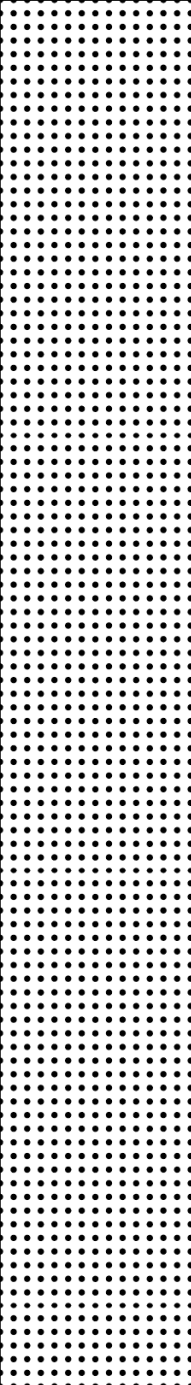
Notes:

Log of Boring SB-42

Date: 2/17/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2403
 Bore Loc Background (cpm): 14092
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3	SW	Well Graded SAND with Clay and Gravel, gravel = 3 centimeters, clay in discrete lumps & nodules, fine- to coarse-grained sand, loose, gray, brown & orange (iron staining), weak HCl reaction on gray sandstone clasts		2581	178	16.9695
0.2					2434	31	15.1761
0.4					2488	85	15.8349
0.6					2451	48	15.3835
0.8					2429	26	15.1151
1					2345	-58	14.0903
1.2					-		
1.4					-		
1.6							
1.8							
2							
2.2							
2.4							
2.6							
2.8							
3							
3.2							
3.4							
3.6							
3.8							

Notes:

Log of Boring SB-43

Date: 2/16/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 3787
 Bore Loc Background (cpm): 89961
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.5	SM	Moist Clay, Silt & Sand surface material		6557	2770	48.5919
0.2							
0.4		SP	Poorly Graded SAND with Silt, fine-grained sand, loose, light brown, dry, no HCl reaction, gray calcareous sandstone in shoe		4793	1006	27.0711
0.6							
0.8							
1							
1.2					4140	353	19.1045
1.4							
1.6							
1.8					3666	-121	13.3217
2							
2.2		SP	Poorly Graded SAND with Silt, fine-grained sand, loose, light brown, dry, no HCl reaction, gray calcareous sandstone in shoe		3837	50	15.4079
2.4							
2.6							
2.8					3833	46	15.3591
3							
3.2		SP	Poorly Graded SAND with Silt, fine-grained sand, loose, light brown, dry, no HCl reaction, gray calcareous sandstone in shoe		3744	-43	14.2733
3.4							
3.6							
3.8					-		

Notes:

Log of Boring SB-44

Date: 2/5/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/8
 Logged By: L. Dalton
 SCAG Blank (cpm): 1625
 Bore Loc Background (cpm): 48947
 Total Depth (ft.): 8
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	1.9	ML	Sandy SILT, fine-grained sand, non-plastic, soft, light brown, dry, no HCl reaction	.....	2026	401	
0.4				.....		
0.8				.....	1781	156	
1.2				.....	1709	84	
1.6				.....	1527	-98	
2				.....	-	
2.4				.....	-	
2.8				.....	-	
3.2				.....	-	
3.6				.....	-	
4	0.7		Sandy SILT, fine-grained sand, non-plastic, soft, light brown, dry, no HCl reaction	.....	-	
4.4				.....	-	
4.8				.....	-	
5.2				.....	-	
5.6				.....	-	
6				.....	-	
6.4				.....	-	
6.8				.....	-	
7.2		.....		-		
7.6		.....		-		

Notes:

Log of Boring SB-44RD

Date: 2/18/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 19991
 Bore Loc Background (cpm): 111358
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.8	SM	Rock fragments over light brown Silty SANDstone		19664	-327	10.8085
0.2							
0.4							
0.6							
0.8							
1							
1.2							
1.4							
1.6							
1.8							
2							
2.2							
2.4							
2.6							
2.8							
3							
3.2							
3.4							
3.6							
3.8							
			Silty SAND, poorly graded, fine-grained sand, loose, light brown, dry, no HCl reaction		17836	-2155	-11.493 1
					16832	-3159	-23.741 9
					17041	-2950	-21.192 1
					18329	-1662	-5.4785
					17981	-2010	-9.7241
					18275	-1716	-6.1373
					-		

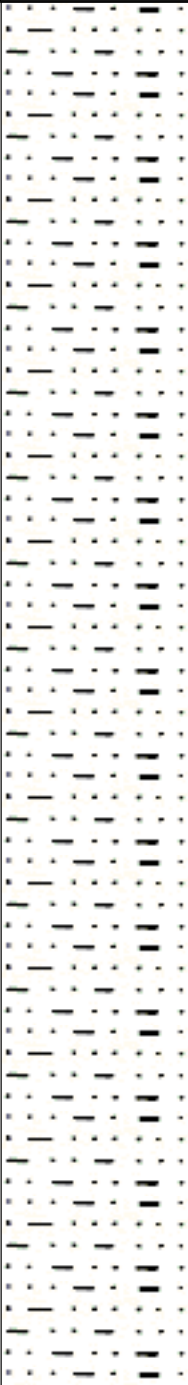
Notes:

Log of Boring SB-45

Date: 2/18/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 19941
 Bore Loc Background (cpm): 55452
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)	
0	3	SM	Moist Silt & Sand surface material		17742	-2199	-12.029 9	
0.2								
0.4								
0.6								
0.8					18353	-1588	-4.5757	
1								
1.2					18167	-1774	-6.8449	
1.4								
1.6								
1.8					17840	-2101	-10.834 3	
2			Silty SAND, poorly graded, fine-grained sand, loose, light brown, dry					
2.2					18775	-1166	0.5727	
2.4								
2.6								
2.8					19437	-504	8.6491	
3								
3.2					-			
3.4								
3.6								
3.8					-			

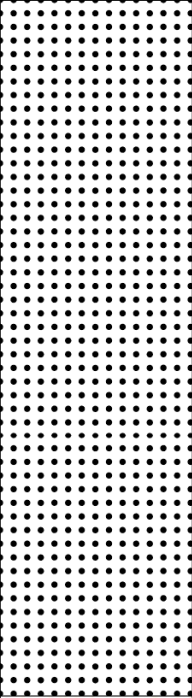
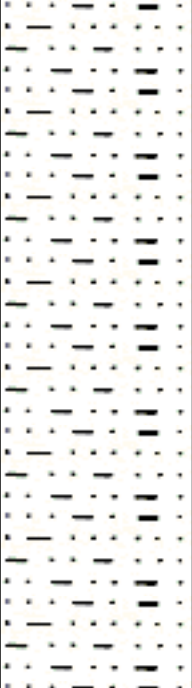
Notes:

Log of Boring SB-46

Date: 2/14/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 3215
 Bore Loc Background (cpm): 23154
 Total Depth (ft.): 8
 Total Depth Criterion: Stability



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.7	SW	Well Graded SAND, fine- to coarse-grained sand, 5% Dakota gravel <1.5 cm, loose, light brown, dry		3396	181	17.0061
0.4					3361	146	16.5791
0.8					3434	219	17.4697
1.2					3389	174	16.9207
1.6					3227	12	14.9443
2					3451	236	17.6771
2.4					-		
2.8					-		
3.2	2.8	SM	Silty SAND, poorly graded, fine-grained sand, medium dense, light brown, dry		3306	91	15.9081
3.6					3058	-157	12.8825
4					3096	-119	13.3461
4.4					3187	-28	14.4563
4.8					3283	68	15.6275
5.2					-		
5.6					-		
6					-		
6.4							
6.8							
7.2							
7.6							

Notes:

Log of Boring SB-47

Date: 2/14/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2253
 Bore Loc Background (cpm): 13448
 Total Depth (ft.): 8
 Total Depth Criterion: Stability



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.3	SM	Moist Clay, Silt & Sand surface material		2314	61	15.5421
0.4					2192	-61	14.0537
0.8					2150	-103	13.5413
1.2	3.3	SM	Silty SAND, poorly graded, fine-grained sand, very loose to loose, light brown, dry		2124	-129	13.2241
1.6					2223	-30	14.4319
2					2279	26	15.1151
2.4					-		
2.8					-		
3.2							
3.6	3.3	SM	Silty SAND, poorly graded, fine-grained sand, medium dense, light brown, dry		2231	-22	14.5295
4					2342	89	15.8837
4.4					2284	31	15.1761
4.8					2234	-19	14.5661
5.2					2367	114	16.1887
5.6					2295	42	15.3103
6					-		
6.4					-		
6.8							
7.2							
7.6							

Notes:

Log of Boring SB-48

Date: 2/4/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/8
 Logged By: L. Dalton
 SCAG Blank (cpm): 1625
 Bore Loc Background (cpm): 12324
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	1.5	SM	Silty SAND, poorly graded, fine- to medium-grained sand (predominantly fine), subangular to subround, non-plastic, loose, light brown, dry, no HCl reaction		1532	-93	
0.2							
0.4							
0.6							
0.8					1593	-32	
1							
1.2							
1.4					1540	-85	
1.6							
1.8					-		
2							
2.2					-		
2.4							
2.6							
2.8					-		
3							
3.2					-		
3.4							
3.6							
3.8					-		

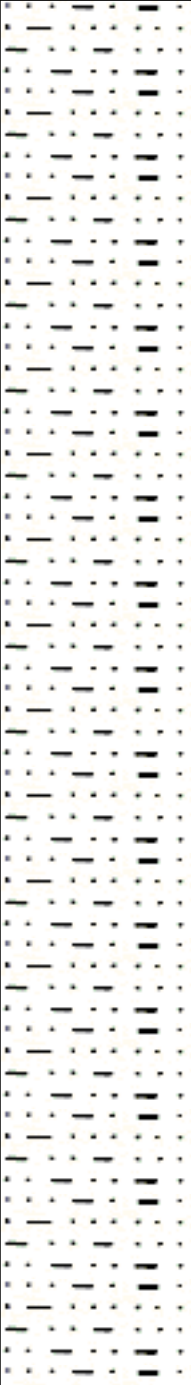
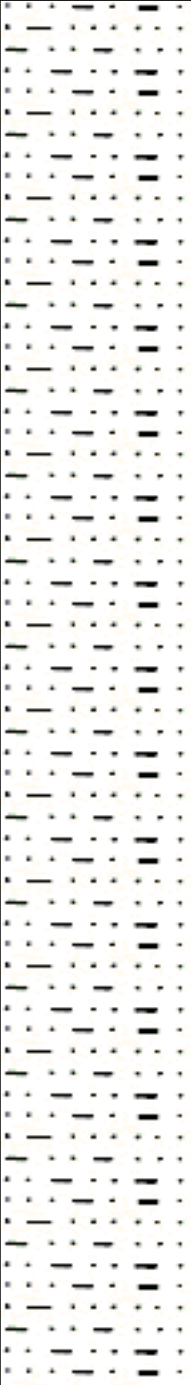
Notes:

Log of Boring SB-49

Date: 2/17/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2361
 Bore Loc Background (cpm): 15224
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3	SM	Silty SAND, few clay poorly graded, fine-grained sand, medium dense, light brown, dry, caliche streaks		2434	73	15.6885
0.2							
0.4							
0.6							
0.8					2508	147	16.5913
1							
1.2							
1.4					2477	116	16.2131
1.6							
1.8							
2					2375	14	14.9687
2.2					2560	199	17.2257
2.4							
2.6							
2.8					2287	-74	13.8951
3							
3.2					-		
3.4							
3.6							
3.8					-		

Notes:

Log of Boring SB-50

Date: 2/17/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 3093
 Bore Loc Background (cpm): 13220
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.3	SM	Moist Clay, Silt & Sand surface material		2998	-95	13.6389
0.2							
0.4			Silty SAND, iron stained		3210	117	16.2253
0.6							
0.8			Moist Clay, Silt & Sand surface material		3064	-29	14.4441
1							
1.2			Silty SAND, few clay, poorly graded, fine-grained sand, medium dense, light brown, dry, caliche streaks		3009	-84	13.7731
1.4							
1.6					2957	-136	13.1387
1.8							
2					2711	-382	10.1375
2.2							
2.4							
2.6							
2.8							
3							
3.2							
3.4							
3.6							
3.8							

Notes:

Log of Boring SB-51

Date: 2/4/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/8
 Logged By: L. Dalton
 SCAG Blank (cpm): 1625
 Bore Loc Background (cpm): 118854
 Total Depth (ft.): 4
 Total Depth Criterion: Refusal



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	2	ML	Sandy SILT, fine-grained sand, low plasticity, soft, light brown, dry, no HCl reaction				
0.2					2455	830	
0.4							
0.6							
0.8					2005	380	
1							
1.2					1837	212	
1.4							
1.6					1692	67	
1.8							
2							
2.2					-		
2.4							
2.6					-		
2.8							
3							
3.2					-		
3.4							
3.6							
3.8					-		

Notes:

Log of Boring SB-51RD

Date: 2/18/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 19991
 Bore Loc Background (cpm): 135307
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.6	ML	SILT with Sand, no to low plasticity, soft, light brown, dry, strong HCl reaction				
0.2					20303	312	18.6043
0.4							
0.6							
0.8					18252	-1739	-6.4179
1							
1.2					18206	-1785	-6.9791
1.4							
1.6							
1.8					18292	-1699	-5.9299
2	3.6	ML	SILT with Sand, no to low plasticity, soft, light brown, dry, strong HCl reaction				
2.2					18650	-1341	-1.5623
2.4							
2.6							
2.8					19041	-950	3.2079
3							
3.2					17977	-2014	-9.7729
3.4							
3.6	3.6	ML	SILT with Sand, no to low plasticity, soft, light brown, dry, strong HCl reaction				
3.8					-		

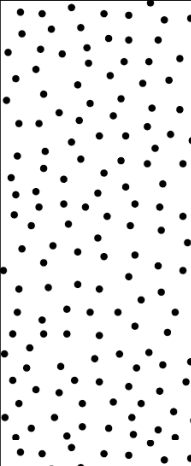
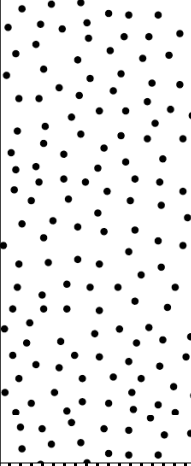
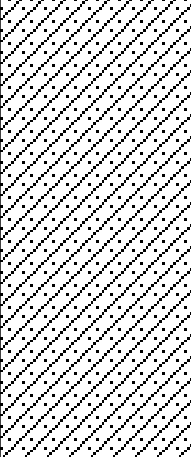
Notes:

Log of Boring SB-52

Date: 2/4/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/8
 Logged By: L. Dalton
 SCAG Blank (cpm): 1625
 Bore Loc Background (cpm): 178348
 Total Depth (ft.): 12
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	1.6	SP	Poorly Graded SAND, fine-grained sand, loose, light brown, dry weak HCl reaction		4129	2504	
1					3837	2212	
2					2016	391	
3					-		
4					-		
5					-		
6	0.5	SP	Poorly Graded SAND, trace clay, fine-grained sand, non-plastic, medium dense, light brown, dry, weak HCl reaction		1665	40	
7					-		
8					-		
9					-		
10					-		
11					-		
12	0.8	SP-S C	Poorly Graded SAND with Clay, fine-grained sand, medium dense, non-plastic, light brown, dry to moist, weak HCl reaction		1557	-68	
					-		
					-		
					-		
					-		
					-		

Notes:

Log of Boring SB-52-R

Date: 2/4/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/8
 Logged By: L. Dalton
 SCAG Blank (cpm): 1625
 Bore Loc Background (cpm): 178348
 Total Depth (ft.): 12
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	1.4	SP	Poorly Graded SAND, trace clay, fine-grained sand, non-plastic, loose, light brown, dry, weak HCl reaction		4912	3287	
1					5035	3410	
2					2553	928	
3					-		
4					-		
5					-		
6	1.4	SP	Poorly Graded SAND, few clay, fine-grained sand, non-plastic, loose, light brown, dry, weak HCl reaction		1683	58	
7					1628	3	
8					1600	-25	
9					-		
10					-		
11					-		
12	0.7	SP-S C	Poorly Graded SAND with Clay, fine-grained sand, medium dense, non-plastic, light brown, dry to moist, weak HCl reaction		1525	-100	
					-		
					-		
					-		
					-		
					-		

Notes:

Log of Boring SB-52RD

Date: 2/18/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 19991
 Bore Loc Background (cpm): 189692
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.8	SM	Silty SAND, poorly graded, fine-grained sand, loose, light brown, dry, no HCl reaction		22065	2074	40.1007
0.2							
0.4							
0.6							
0.8					23907	3916	62.5731
1							
1.2							
1.4					23924	3933	62.7805
1.6							
1.8					22762	2771	48.6041
2	3.8	SM	Silty SAND, poorly graded, fine-grained sand, loose, light brown, dry, no HCl reaction				
2.2					18446	-1545	-4.0511
2.4							
2.6							
2.8					18479	-1512	-3.6485
3							
3.2					18355	-1636	-5.1613
3.4							
3.6	3.8	SM	Silty SAND, poorly graded, fine-grained sand, loose, light brown, dry, no HCl reaction				
3.8					-		

Notes:

Log of Boring SB-53

Date: 2/18/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 19991
 Bore Loc Background (cpm): 77765
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.5	ML	Sandy SILT, fine-grained sand, non-plastic, soft, light brown, dry, no HCl reaction				
0.2					21737	1746	36.0991
0.4							
0.6							
0.8					23316	3325	55.3629
1							
1.2					23486	3495	57.4369
1.4							
1.6							
1.8					22348	2357	43.5533
2	3.5	ML	Sandy SILT, fine-grained sand, non-plastic, soft, light brown, dry, no HCl reaction				
2.2					19520	-471	9.0517
2.4							
2.6							
2.8					19533	-458	9.2103
3							
3.2					18461	-1530	-3.8681
3.4							
3.6	3.5	ML	Sandy SILT, fine-grained sand, non-plastic, soft, light brown, dry, no HCl reaction				
3.8					-		

Notes:

Log of Boring SB-54

Date: 2/14/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 3199
 Bore Loc Background (cpm): 16594
 Total Depth (ft.): 8
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.5	SM	Moist Clay, Silt & Sand surface material		3515	316	18.6531
0.4					3253	54	15.4567
0.8		SP	Poorly Graded Sand, fine-grained sand, very loose to loose, light brown, dry		3381	182	17.0183
1.2					3369	170	16.8719
1.6					3469	270	18.0919
2					3347	148	16.6035
2.4					3220	21	15.0541
2.8					-		
3.2					3222	23	15.0785
3.6					3388	189	17.1037
4	3247				48	15.3835	
4.4	3423				224	17.5307	
4.8	3.3			3470	271	18.1041	
5.2				3453	254	17.8967	
5.6				3175	-24	14.5051	
6				-			
6.4							
6.8							
7.2							
7.6							

Notes:

Log of Boring SB-55

Date: 2/14/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2472
 Bore Loc Background (cpm): 13312
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.3	SM	Moist Clay, Silt & Sand surface material		2408	-64	14.0171
0.2							
0.4							
0.6		SP	Poorly Graded SAND with Silt, fine-grained sand, very loose to loose, light brown, dry		2066	-406	9.8447
0.8							
1							
1.2					2107	-365	10.3449
1.4							
1.6							
1.8					2093	-379	10.1741
2							
2.2	3.3	SP	Poorly Graded SAND with Silt, fine-grained sand, very loose to loose, light brown, dry		2044	-428	9.5763
2.4							
2.6							
2.8					2172	-300	11.1379
3							
3.2					-		
3.4							
3.6					-		
3.8							

Notes:

Log of Boring SB-56

Date: 2/4/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/8
 Logged By: L. Dalton
 SCAG Blank (cpm): 1625
 Bore Loc Background (cpm): 14003
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	2.7	SM	Silty SAND, poorly graded, fine- to medium-grained sand (predominantly fine), subangular to subround, non-plastic, loose, light brown, dry, no HCl reaction		1646	21	
0.2							
0.4							
0.6							
0.8					1705	80	
1							
1.2							
1.4					1711	86	
1.6							
1.8					1793	168	
2					1645	20	
2.2							
2.4							
2.6							
2.8					-		
3							
3.2					-		
3.4							
3.6							
3.8							

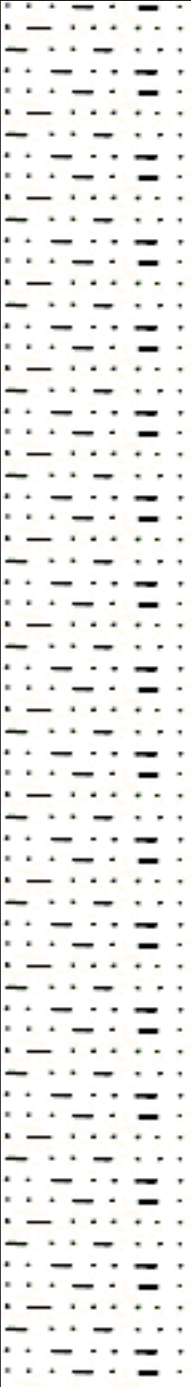
Notes:

Log of Boring SB-57

Date: 2/4/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/8
 Logged By: L. Dalton
 SCAG Blank (cpm): 1625
 Bore Loc Background (cpm): 12352
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	2.3	SM	Silty SAND with gravel, well graded, fine- to coarse-grained sand, fine gravel, subangular to subround, non-plastic, loose, light brown, dry, weak HCl reaction		1776	151	
0.2							
0.4							
0.6							
0.8					1749	124	
1							
1.2							
1.4					1806	181	
1.6							
1.8					1626	1	
2							
2.2					-		
2.4							
2.6							
2.8					-		
3							
3.2					-		
3.4							
3.6							
3.8					-		

Notes:

Log of Boring SB-58

Date: 2/17/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2437
 Bore Loc Background (cpm): 15179
 Total Depth (ft.): 8
 Total Depth Criterion: Stability



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)		
0	3	SM	Moist Clay, Silt & Sand surface material		2541	104	16.0667		
0.4					2712	275	18.1529		
0.8			Silty SAND, poorly graded, fine-grained sand, loose, light brown, dry, white caliche streaks		2572	135	16.4449		
1.2					2645	208	17.3355		
1.6					2635	198	17.2135		
2					2712	275	18.1529		
2.4					-				
2.8					-				
3.2					Silty SAND, poorly graded, fine-grained sand, loose, light brown, dry, white caliche streaks		2516	79	15.7617
3.6							2668	231	17.6161
4	2571	134	16.4327						
4.4	2582	145	16.5669						
4.8	2637	200	17.2379						
5.2	2574	137	16.4693						
5.6	-								
6	-								
6.4	3.2	SM	Silty SAND, poorly graded, fine-grained sand, loose, light brown, dry, white caliche streaks						
6.8									
7.2									
7.6									

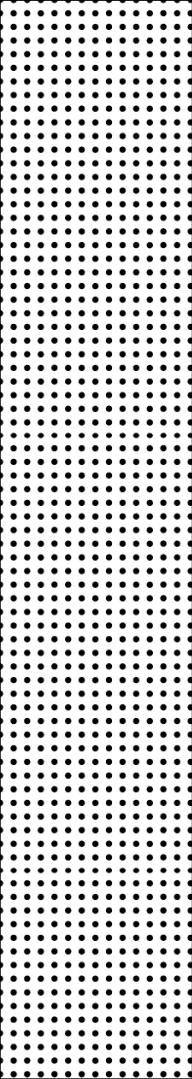
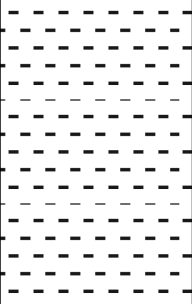
Notes:

Log of Boring SB-59

Date: 2/17/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 3425
 Bore Loc Background (cpm): NM
 Total Depth (ft.): 8
 Total Depth Criterion: Stability



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.1	SW	Well Graded GRAVEL with Sand, trace silt and clay, fine- to coarse-grained sand, gravel = 4 centimeters, loose, gray, light brown & orange (iron staining), moist, weak HCl reaction		3425	0	14.7979
0.4					3493	68	15.6275
0.8					3525	100	16.0179
1.2					3562	137	16.4693
1.6					3687	262	17.9943
2					3726	301	18.4701
2.4					-		
2.8	2.7	CL	Lean CLAY, trace caliche, low plasticity, firm, brown, moist		-		
3.2					-		
3.6					3530	105	16.0789
4					3699	274	18.1407
4.4					3705	280	18.2139
4.8					3467	42	15.3103
5.2					3713	288	18.3115
5.6					-		
6					-		
6.4					-		
6.8					-		
7.2							
7.6							

Notes:

Log of Boring SB-60

Date: 2/18/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 15138
 Bore Loc Background (cpm): 174829
 Total Depth (ft.): 12
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.5	SM	Moist Clay, Silt & Sand surface material		20130	4992	75.7003
1					21728	6590	95.1959
2		SP	Weathered gray sandstone - possible ore material		17378	2240	42.1259
3	3.1	ML	Sandy SILT, fine-grained sand, non-plastic, soft, light brown, dry, weak HCl reaction		16803	1665	35.1109
4					16400	1262	30.1943
5					15444	306	18.5311
6					17813	2675	47.4329
7					-		
8					17732	2594	46.4447
9					14914	-224	12.0651
10					15210	72	15.6763
11					15266	128	16.3595
12					15065	-73	13.9073
	3.6	CL	Lean CLAY, few fine-grained sand, medium plasticity, firm to hard, brown, dry to moist, white caliche streaks		16227	1089	28.0837
					-		
					-		
					16943	1805	36.8189
					14990	-148	12.9923
					14471	-667	6.6605
					14836	-302	11.1135
					15110	-28	14.4563
	3.6	CL	Lean CLAY, few fine-grained sand, medium plasticity, firm to hard, brown, dry to moist, white caliche streaks		13742	-1396	-2.2333
					14111	-1027	2.2685
					-		

Notes:

Log of Boring SB-61

Date: 2/7/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: L. Dalton
 SCAG Blank (cpm): 16578
 Bore Loc Background (cpm): NM
 Total Depth (ft.): 24
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	4	SP-S C	Poorly Graded SAND with Clay, fine- to coarse-grained sand (predominantly fine), subangular to subround, loose, non-plastic, light gray (some white color 0.8-1.5), moist to moist, no HCl reaction		21499		
					19342	2764	48.5187
					17762	1184	29.2427
2					16143	-435	9.4909
	3.7	ML	Sandy SILT, fine- to medium-grained sand (predominantly fine), non-plastic, soft, light brown, dry, weak HCl reaction		16271	-307	11.0525
					16751	173	16.9085
					16645	67	15.6153
4					17229		
	3.3	ML	Sandy SILT, fine- to medium-grained sand (predominantly fine), non-plastic, soft, light brown, dry, weak HCl reaction		17200		
					16004	-574	7.7951
					16143	-435	9.4909
6					16238	-340	10.6499
	3.4	SM	Silty SAND, poorly graded, fine-grained sand, non-plastic, loose, light brown, dry, strong HCl reaction		16785	207	17.3233
					16518	-60	14.0659
					17407		
8					-		
	3.5	SM	Silty SAND, poorly graded, fine-grained sand, non-plastic, loose, light brown, dry, strong HCl reaction		16953	-292	11.2355
					16286	-561	7.9537
					16017	227	17.5673
10					16805	-1649	-5.3199
	3.6	SM	Silty SAND, poorly graded, fine-grained sand, non-plastic, loose, light brown, dry, strong HCl reaction		14929		
					16575		
					-		
12					-		
	3.7	SM	Silty SAND, poorly graded, fine-grained sand, non-plastic, loose, light brown, dry, strong HCl reaction		16397	-557	8.0025
					16021	-1050	1.9879
					15528	-1156	0.6947
14					15422	-2169	-11.6639
	3.8	SM	Silty SAND, poorly graded, fine-grained sand, non-plastic, loose, light brown, dry, strong HCl reaction		14409		
					16324		
					-		
16					-		
	3.9	SM	Silty SAND, poorly graded, fine-grained sand, non-plastic, loose, light brown, dry, strong HCl reaction		18909	-57	14.1025
					16521	-637	7.0265
					15941	-729	5.9041
18					15849	-912	3.6715
	4.0	SM	Silty SAND, poorly graded, fine-grained sand, non-plastic, loose, light brown, dry, strong HCl reaction		15666	-1479	-3.2459
					15099		
					17181		
20					-		
	4.1	SC	Clayey SAND, fine-grained sand, non-plastic, medium dense, light brown, dry to moist, strong HCl reaction		17349	-307	11.0525
					16271	-268	11.5283
					16310	-889	3.9521
22					15689	-891	3.9277
	4.2	SC	Clayey SAND, fine-grained sand, non-plastic, medium dense, light brown, dry to moist, strong HCl reaction		15687	-19	14.5661
24					16559		

Notes:

Log of Boring SB-62

Date: 2/18/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 4366
 Bore Loc Background (cpm): 50571
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	2.8	SM	Moist Clay, Silt & Sand surface material		4681	315	18.6409
0.2							
0.4							
0.6		ML	Sandy SILT, fine-grained sand, non-plastic, soft, light brown, dry, weak HCl reaction, white caliche streaks		4292	-74	13.8951
0.8							
1							
1.2					4175	-191	12.4677
1.4							
1.6	2.8	ML	Sandy SILT, fine-grained sand, non-plastic, soft, light brown, dry, weak HCl reaction, white caliche streaks		4105	-261	11.6137
1.8							
2							
2.2					4069	-297	11.1745
2.4							
2.6					-		
2.8	2.8	ML	Sandy SILT, fine-grained sand, non-plastic, soft, light brown, dry, weak HCl reaction, white caliche streaks				
3							
3.2					-		
3.4							
3.6							
3.8					-		

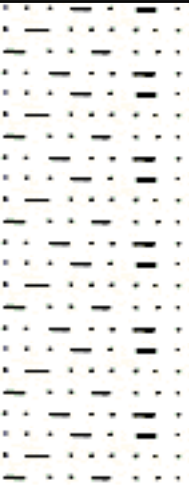
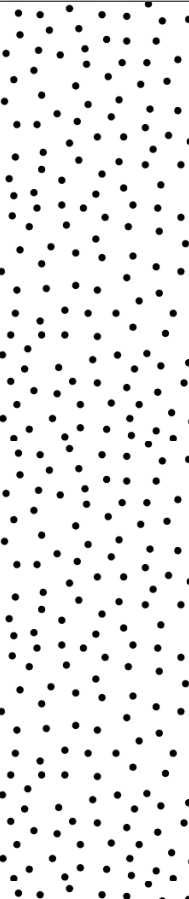
Notes:

Log of Boring SB-63

Date: 2/14/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2901
 Bore Loc Background (cpm): 19933
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)				
0	3.5	SM	Moist Clay, Silt & Sand surface material		2904	3	14.8345				
0.2											
0.4											
0.6		SP	Poorly Graded SAND with Silt, fine-grained sand, very loose to loose, light brown, dry		2695	-206	12.2847				
0.8											
1											
1.2					2531	-370	10.2839				
1.4											
1.6					2602	-299	11.1501				
1.8											
2											
2.2					2644	-257	11.6625				
2.4											
2.6									2648	-253	11.7113
2.8											
3											
3.2	2617	-284	11.3331								
3.4											
3.6					-						
3.8											

Notes:

Log of Boring SB-64

Date: 2/14/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2109
 Bore Loc Background (cpm): 12848
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	2.8	SP	Poorly Graded SAND with Silt, <5% gravel, <0.5 cm diameter, fine-grained sand, loose to medium dense, light brown		1809	-300	11.1379
0.2							
0.4							
0.6							
0.8					2013	-96	13.6267
1							
1.2							
1.4					2086	-23	14.5173
1.6							
1.8					1951	-158	12.8703
2							
2.2					2110	1	14.8101
2.4							
2.6							
2.8					-		
3							
3.2					-		
3.4							
3.6							
3.8					-		

Notes:

Log of Boring SB-65

Date: 2/17/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2289
 Bore Loc Background (cpm): 12961
 Total Depth (ft.): 8
 Total Depth Criterion: Stability



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)				
0	3.2	SM	Moist Clay, Silt & Sand surface material		2431	142	16.5303				
0.4					2379	90	15.8959				
0.8			Silty SAND, trace gravel, poorly graded, fine-grained sand, gravel = 1 centimeter, brown, loose, dry, white caliche streaks		2348	59	15.5177				
1.2					2436	147	16.5913				
1.6					2390	101	16.0301				
2					2463	174	16.9207				
2.4					-						
2.8					-						
3.2					3.5	SM	Silty SAND, trace gravel, poorly graded, fine-grained sand, gravel = 1 centimeter, brown, loose, dry, white caliche streaks, rock in shoe		2345	56	15.4811
3.6									2451	162	16.7743
4	2500	211	17.3721								
4.4	2293	4	14.8467								
4.8	2493	204	17.2867								
5.2	2496	207	17.3233								
5.6	2408	119	16.2497								
6	-										
6.4											
6.8											
7.2											
7.6											

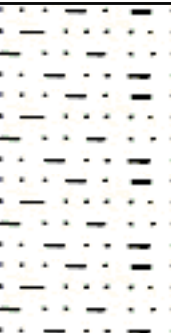

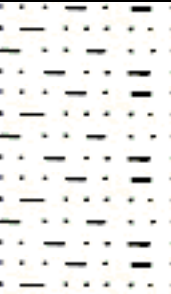




Notes:

Log of Boring SB-66

Date: 2/17/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2767
 Bore Loc Background (cpm): 107459
 Total Depth (ft.): 16
 Total Depth Criterion: Stability



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.6	SM	Moist Clay, Silt & Sand surface material		5800	3033	51.8005
1					7685	4918	74.7975
					9499	6732	96.9283
2			Silty SAND, poorly graded, fine-grained sand, loose, light brown, dry		9111	6344	92.1947
					8605	5838	86.0215
3					8751	5984	87.8027
					5912	3145	53.1669
4		-					
4	3.7	Slough	Slough		4955	2188	41.4915
5		SM	Silty SAND, poorly graded, fine-grained sand, <1% gravel 1/2 cm diameter, loose, light brown, dry, caliche streaks		3439	672	22.9963
					3141	374	19.3607
6					3063	296	18.4091
					3195	428	20.0195
7					3010	243	17.7625
					3054	287	18.2993
8		-					
8	3.7	Slough	Slough		4225	1458	32.5855
9		SM	Silty SAND, few clay, trace gravel, poorly graded, fine-grained sand, gravel = 0.5 centimeter, 5-10% clay, loose, light brown, dry, caliche streaks		3206	439	20.1537
					3071	304	18.5067
10					3185	418	19.8975
					2981	214	17.4087
11					3013	246	17.7991
					3066	299	18.4457
12		-					
12	3.5	Slough	Slough		4464	1697	35.5013
13		SM	Silty SAND, trace gravel, poorly graded, fine-grained sand, gravel = 0.5 centimeter, 5-10% clay, loose, light brown, dry, caliche streaks, minor iron staining		3213	446	20.2391
					3050	283	18.2505
14					2971	204	17.2867
					2998	231	17.6161
15					3115	348	19.0435
					3089	322	18.7263
16		-					

Notes:

Log of Boring SB-67

Date: 2/17/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 3710
 Bore Loc Background (cpm): 17201
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.5	SM	Moist Clay, Silt & Sand surface material		3695	-15	14.6149
0.2							
0.4							
0.6					3791	81	15.7861
0.8							
1							
1.2					3643	-67	13.9805
1.4							
1.6							
1.8					3672	-38	14.3343
2							
2.2							
2.4	3.5	SM	Silty SAND, poorly graded, fine-grained sand, loose, light brown, dry, white caliche streaks		3542	-168	12.7483
2.6							
2.8					3496	-214	12.1871
3							
3.2					3593	-117	13.3705
3.4							
3.6					-		
3.8							

Notes:

Log of Boring SB-68

Date: 2/18/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 7416
 Bore Loc Background (cpm): 92958
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.8	SM	Moist Clay, Silt & Sand surface material		8859	1443	32.4025
0.2					8395	979	26.7417
0.4					8475	1059	27.7177
0.6		ML	Sandy SILT, fine-grained sand, non-plastic, soft, light brown, dry		7809	393	19.5925
0.8					7630	214	17.4087
1					7426	10	14.9199
1.2					7376	-40	14.3099
1.4					-		
1.6							
1.8							
2							
2.2							
2.4							
2.6							
2.8							
3							
3.2							
3.4							
3.6							
3.8							

Notes:

Log of Boring SB-69

Date: 2/18/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 7110
 Bore Loc Background (cpm): 46023
 Total Depth (ft.): 12
 Total Depth Criterion: Stability



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.5	SM	Moist Clay, Silt & Sand surface material		7665	555	21.5689
1					7654	544	21.4347
2			Silty SAND, poorly graded, fine-grained sand, loose to very loose, light brown, dry, no HCl reaction		7520	410	19.7999
3					7433	323	18.7385
4					7503	393	19.5925
5					7613	503	20.9345
6					7549	439	20.1537
7					-		
8	3.4	ML	Sandy SILT, non-plastic, soft, light brown, dry		6943	-167	12.7605
9					6355	-755	5.5869
10					6950	-160	12.8459
11					6783	-327	10.8085
12					7073	-37	14.3465
13					7014	-96	13.6267
14					7405	295	18.3969
15					-		
16	2.6	SM	Silty SAND, poorly graded, fine-grained sand, loose, light brown, dry, white caliche streaks		7585	475	20.5929
17					7492	382	19.4583
18					7331	221	17.4941
19					7316	206	17.3111
20					7399	289	18.3237
21					-		
22					-		
23	-						

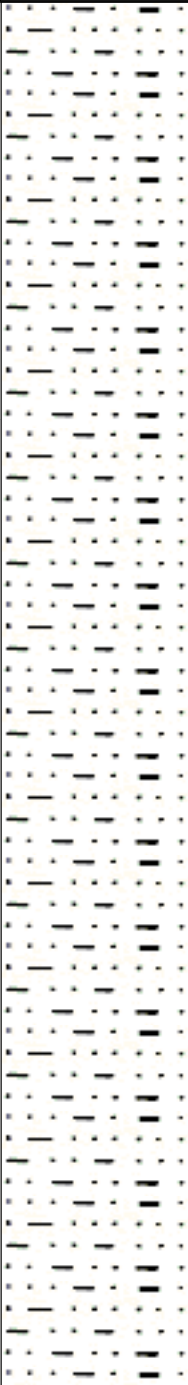
Notes:

Log of Boring SB-70

Date: 2/18/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 4366
 Bore Loc Background (cpm): 45686
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)	
0	3.4	SM	Moist Clay, Silt & Sand surface material		4908	542	21.4103	
0.2								
0.4								
0.6								
0.8								
1								
1.2			Silty SAND, poorly graded, loose, fine-grained sand, light brown, dry		4070	-296	11.1867	
1.4								
1.6								
1.8					3995	-371	10.2717	
2								
2.2								
2.4								
2.6								
2.8								
3								
3.2					3977	-389	10.0521	
3.4								
3.6								
3.8					3980	-386	10.0887	
					3916	-450	9.3079	
					-			

Notes:

Log of Boring SB-71

Date: 2/14/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2267
 Bore Loc Background (cpm): 16487
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0		SM	Moist Clay, Silt & Sand surface material		2301	34	15.2127
0.2					2243	-24	14.5051
0.4	3	SP	Poorly Graded SAND with Silt, fine-grained sand, loose to medium dense, light brown, dry		2368	101	16.0301
0.6					2320	53	15.4445
0.8					2268	1	14.8101
1					2246	-21	14.5417
1.2					-		
1.4					-		
1.6							
1.8							
2							
2.2							
2.4							
2.6							
2.8							
3							
3.2							
3.4							
3.6							
3.8							

Notes:

Log of Boring SB-72

Date: 2/14/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 1960
 Bore Loc Background (cpm): 12389
 Total Depth (ft.): 8
 Total Depth Criterion: Stability



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3	SM	Moist Clay, Silt & Sand surface material		1914	-46	14.2367
0.4					1969	9	14.9077
0.8					1928	-32	14.4075
1.2	3	SW	Well Graded SAND with Silt, fine- to coarse-grained sand, <5% gravel, <1 cm diameter, loose, light brown, some orange iron staining, dry		1942	-18	14.5783
1.6					1973	13	14.9565
2					1997	37	15.2493
2.4					-		
2.8					-		
3.2					1970	10	14.9199
3.6					2016	56	15.4811
4					2084	124	16.3107
4.4					2089	129	16.3717
4.8					2069	109	16.1277
5.2	3.3	SW	Well Graded SAND with Silt, fine- to coarse-grained sand, <5% gravel, <1 cm diameter, loose, light brown, some orange iron staining, dry		2043	83	15.8105
5.6					2060	100	16.0179
6					-		
6.4					-		
6.8							
7.2							
7.6							

Notes:

Log of Boring SB-73

Date: 2/17/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2600
 Bore Loc Background (cpm): 13759
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.4	SM	Moist Clay, Silt & Sand surface material		2590	-10	14.6759
0.2							
0.4							
0.6		CL	Clay & Silt, dry, gray		2576	-24	14.5051
0.8							
1							
1.2					2531	-69	13.9561
1.4							
1.6		SM	Silty SAND, poorly graded, fine-grained sand, loose, light brown, dry, no HCl reaction		2470	-130	13.2119
1.8							
2							
2.2					2573	-27	14.4685
2.4							
2.6					2725	125	16.3229
2.8							
3							
3.2					2572	-28	14.4563
3.4							
3.6							
3.8					-		

Notes:

Log of Boring SB-74

Date: 2/17/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2716
 Bore Loc Background (cpm): 17287
 Total Depth (ft.): 8
 Total Depth Criterion: Bedrock



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.2	SM	Moist Clay, Silt & Sand surface material		2760	44	15.3347
0.4					2841	125	16.3229
0.8			Silty SAND, light brown, dry		2810	94	15.9447
1.2					2822	106	16.0911
1.6					2708	-8	14.7003
2		CL	Sandy CLAY, fine-grained sand, low plasticity, medium dense, brown, dark gray, dry, weathered black shale fragments		2981	265	18.0309
2.4					-		
2.8					-		
3.2							
3.6							
4	3.5	Shale	Mancos SHALE, slightly weathered, dark gray, caliche, iron minerals, gypsum mineralized in fractures and partings		2553	-163	12.8093
4.4					2634	-82	13.7975
4.8					2802	86	15.8471
5.2					2834	118	16.2375
5.6					2793	77	15.7373
6					2849	133	16.4205
6.4					2648	-68	13.9683
6.8					-		
7.2							
7.6							

Notes:

Log of Boring SB-75

Date: 2/17/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 3255
 Bore Loc Background (cpm): 21676
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.3	CL	Sandy CLAY, fine-grained sand, medium plasticity, dark brown, dry, strong HCl reaction		3217	-38	14.3343
0.2							
0.4							
0.6							
0.8					3105	-150	12.9679
1							
1.2							
1.4					3075	-180	12.6019
1.6							
1.8					3083	-172	12.6995
2	3.3	CL	Sandy CLAY, fine-grained sand, medium plasticity, dark brown, dry, strong HCl reaction				
2.2					3239	-16	14.6027
2.4							
2.6							
2.8					3186	-69	13.9561
3							
3.2					-		
3.4							
3.6	3.3	CL	Sandy CLAY, fine-grained sand, medium plasticity, dark brown, dry, strong HCl reaction				
3.8					-		

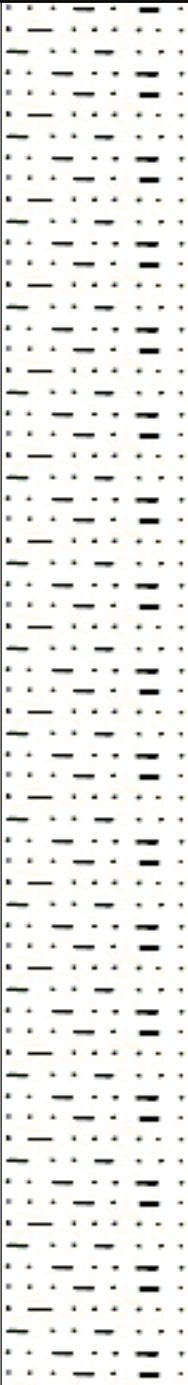
Notes:

Log of Boring SB-76

Date: 2/16/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 3660
 Bore Loc Background (cpm): 23509
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3	SM	Moist Clay, Silt & Sand surface material		3606	-54	14.1391
0.2							
0.4							
0.6							
0.8							
1							
1.2			Silty SAND, poorly graded, fine-grained sand, loose, light brown, dry		3564	-96	13.6267
1.4							
1.6							
1.8					3545	-115	13.3949
2							
2.2					3683	23	15.0785
2.4							
2.6							
2.8					3562	-98	13.6023
3							
3.2					-		
3.4							
3.6					-		
3.8							

Notes:

Log of Boring SB-77

Date: 2/16/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 3188
 Bore Loc Background (cpm): 29845
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.3	SP	Poorly Graded SAND with Silt, fine-grained sand, loose, light brown, dry		3636	448	20.2635
0.2							
0.4							
0.6							
0.8					3374	186	17.0671
1							
1.2							
1.4					3166	-22	14.5295
1.6	3.3	SP	Poorly Graded SAND with Silt, fine-grained sand, loose, light brown, dry				
1.8					3142	-46	14.2367
2							
2.2					3176	-12	14.6515
2.4							
2.6							
2.8					3036	-152	12.9435
3							
3.2	3.3	SP	Poorly Graded SAND with Silt, fine-grained sand, loose, light brown, dry		-		
3.4							
3.6							
3.8					-		

Notes:

Log of Boring SB-78

Date: 2/16/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2352
 Bore Loc Background (cpm): 19009
 Total Depth (ft.): 8
 Total Depth Criterion: Stability



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	2.8	SM	Moist Clay, Silt & Sand surface material		2501	149	16.6157
0.4					2428	76	15.7251
0.8					2451	99	16.0057
1.2	3	SP	Silty SAND, poorly graded, fine-grained sand, loose, light brown, dry, weak HCl reaction		2536	184	17.0427
1.6					2451	99	16.0057
2					-		
2.4					-		
2.8					-		
3.2					2343	-9	14.6881
3.6					2343	-9	14.6881
4					2313	-39	14.3221
4.4					2446	94	15.9447
4.8					2505	153	16.6645
5.2	3	SP	Silty SAND, poorly graded, fine-grained sand, loose, light brown, dry, weak HCl reaction		2516	164	16.7987
5.6					-		
6					-		
6.4	3	SP	Silty SAND, poorly graded, fine-grained sand, loose, light brown, dry, weak HCl reaction		-		
6.8					-		
7.2					-		
7.6	3	SP	Silty SAND, poorly graded, fine-grained sand, loose, light brown, dry, weak HCl reaction		-		
					-		
					-		

Notes:

Log of Boring SB-79

Date: 2/14/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 1963
 Bore Loc Background (cpm): 13022
 Total Depth (ft.): 8
 Total Depth Criterion: Stability



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.3	SM	Moist Clay, Silt & Sand surface material		2138	175	16.9329
0.4					2083	120	16.2619
0.8					1956	-7	14.7125
1.2		SP	Poorly Graded SAND with Silt, fine-grained sand, very loose to loose, light brown, dry		1909	-54	14.1391
1.6					2050	87	15.8593
2					2053	90	15.8959
2.4					-		
2.8					-		
3.2							
3.6							
4	3.2	SW	Well Graded SAND with Silt, fine- to coarse-grained sand, Light brown, gray & orange (heterogeneous & mottled), dry, crushed limestone in shoe		1918	-45	14.2489
4.4					2011	48	15.3835
4.8					1962	-1	14.7857
5.2					2060	97	15.9813
5.6					1995	32	15.1883
6					1981	18	15.0175
6.4					-		
6.8					-		
7.2							
7.6							

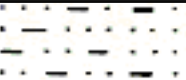
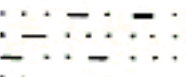
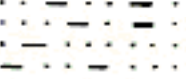
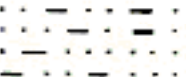
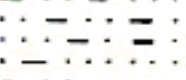
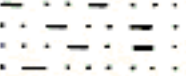
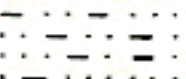
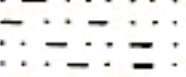
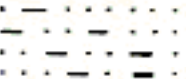
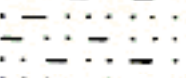

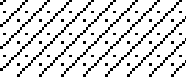

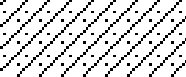


Notes:

Log of Boring SB-80

Date: 2/17/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2303
 Bore Loc Background (cpm): 15290
 Total Depth (ft.): 8
 Total Depth Criterion: Stability



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.6	SM	Moist Clay, Silt & Sand surface material		2362	59	15.5177
0.4			Silty SAND, trace caliche, poorly graded, fine-grained sand, 30% clay/silt, loose, light brown, dry		2467	164	16.7987
0.8					2573	270	18.0919
1.2					2540	237	17.6893
1.6					2565	262	17.9943
2					2451	148	16.6035
2.4					2444	141	16.5181
2.8					-		
3.2					2460	157	16.7133
3.6					2464	161	16.7621
4	3.3	SC/C L	Clayey SAND/Sandy CLAY, trace caliche, poorly graded, fine-grained sand, medium dense, dark brown, low to medium plasticity		2359	56	15.4811
4.4					2412	109	16.1277
4.8					2434	131	16.3961
5.2					2433	130	16.3839
5.6					-		
6					-		
6.4							
6.8							
7.2							
7.6							

Notes:

Log of Boring SB-81

Date: 2/17/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2415
 Bore Loc Background (cpm): 14199
 Total Depth (ft.): 8
 Total Depth Criterion: Stability



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.3	SM	Moist Clay, Silt & Sand surface material		2437	22	15.0663
0.4					2442	27	15.1273
0.8		CL	Sandy CLAY, fine-grained sand, medium dense, dark brown, dry, strong HCl reaction, caliche		2352	-63	14.0293
1.2					2428	13	14.9565
1.6					2490	75	15.7129
2					2436	21	15.0541
2.4					2484	69	15.6397
2.8					-		
3.2							
3.6							
4	3	SM	Silty SAND, poorly graded, fine-grained sand, loose, light brown, dry		2474	59	15.5177
4.4					2438	23	15.0785
4.8					2433	18	15.0175
5.2					2414	-1	14.7857
5.6					2375	-40	14.3099
6					2518	103	16.0545
6.4					-		
6.8					-		
7.2							
7.6							

Notes:

Log of Boring SB-85

Date: 2/16/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2334
 Bore Loc Background (cpm): 15928
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.8	SM	Silty SAND, poorly graded, fine-grained sand, very loose, light brown, dry, weak HCl reaction		2323	-11	14.6637
0.2							
0.4							
0.6							
0.8					2462	128	16.3595
1							
1.2							
1.4					2356	22	15.0663
1.6							
1.8							
2					2355	21	15.0541
2.2	3.8	SM	Silty SAND, poorly graded, fine-grained sand, very loose, light brown, dry, weak HCl reaction		2405	71	15.6641
2.4							
2.6							
2.8					2333	-1	14.7857
3							
3.2					2322	-12	14.6515
3.4							
3.6							
3.8					-		

Notes:

Log of Boring SB-86

Date: 2/16/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2208
 Bore Loc Background (cpm): NM
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.2	SM	Silty SAND, poorly graded, fine-grained sand, loose, light brown, dry, weak HCl reaction		2177	-31	14.4197
0.2							
0.4							
0.6							
0.8					2195	-13	14.6393
1							
1.2							
1.4					2139	-69	13.9561
1.6							
1.8					2141	-67	13.9805
2	3.2	SM	Silty SAND, poorly graded, fine-grained sand, loose, light brown, dry, weak HCl reaction				
2.2					2174	-34	14.3831
2.4							
2.6							
2.8					2170	-38	14.3343
3							
3.2					2160	-48	14.2123
3.4							
3.6	3.2	SM	Silty SAND, poorly graded, fine-grained sand, loose, light brown, dry, weak HCl reaction				
3.8					-		

Notes:

Log of Boring SB-91

Date: 2/16/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2497
 Bore Loc Background (cpm): 17763
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0		SM	Moist Clay, Silt & Sand surface material		2697	200	17.2379
0.2							
0.4	3.4	SP	Poorly Graded SAND with Silt, fine-grained sand, loose, light brown, dry, weak HCl reaction		2581	84	15.8227
0.6							
0.8							
1							
1.2					2421	-76	13.8707
1.4							
1.6							
1.8					2489	-8	14.7003
2							
2.2					2503	6	14.8711
2.4							
2.6							
2.8					2488	-9	14.6881
3							
3.2					2463	-34	14.3831
3.4							
3.6							
3.8					-		

Notes:

Log of Boring SB-92

Date: 2/16/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2494
 Bore Loc Background (cpm): 17566
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.4	SP	Poorly Graded SAND with Silt, fine-grained sand, loose, light brown, dry, no HCl reaction		2662	168	16.8475
0.2					2562	68	15.6275
0.4					2574	80	15.7739
0.6					2463	-31	14.4197
0.8					2405	-89	13.7121
1					2451	-43	14.2733
1.2					2458	-36	14.3587
1.4					-		
1.6							
1.8							
2							
2.2							
2.4							
2.6							
2.8							
3							
3.2							
3.4							
3.6							
3.8							

Notes:

Log of Boring SB-93

Date: 2/16/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2228
 Bore Loc Background (cpm): 15290
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0		SM	Moist Clay, Silt & Sand surface material		2146	-82	13.7975
0.2					2187	-41	14.2977
0.4	3.3	SP	Poorly Graded SAND with Silt, fine-grained sand, loose, light brown, dry, no HCl reaction		2085	-143	13.0533
0.6					2117	-111	13.4437
0.8					2212	-16	14.6027
1					2190	-38	14.3343
1.2					-		
1.4					-		
1.6							
1.8							
2							
2.2							
2.4							
2.6							
2.8							
3							
3.2							
3.4							
3.6							
3.8							

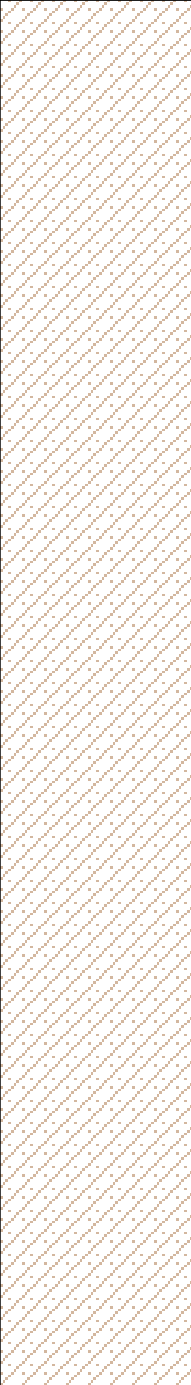
Notes:

Log of Boring SB-97

Date: 2/16/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 2464
 Bore Loc Background (cpm): 15084
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.3	SC	Clayey SAND, poorly graded, fine-grained sand, low plasticity, medium dense, light brown, dry, no HCl reaction		2413	-51	14.1757
0.2					2444	-20	14.5539
0.4					2462	-2	14.7735
0.6					2407	-57	14.1025
0.8					2319	-145	13.0289
1					2264	-200	12.3579
1.2					-		
1.4					-		
1.6							
1.8							
2							
2.2							
2.4							
2.6							
2.8							
3							
3.2							
3.4							
3.6							
3.8							

Notes:

Log of Boring SB-102

Date: 2/16/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 1730
 Bore Loc Background (cpm): 9365
 Total Depth (ft.): 12
 Total Depth Criterion: Stability



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	2.5	SM	Moist Clay, Silt & Sand surface material, iron staining visible throughout core		1700	-30	14.4319
1					1789	59	15.5177
					1723	-7	14.7125
2					1767	37	15.2493
					1819	89	15.8837
3	3.5	CH	Fat CLAY, trace caliche, high plasticity, firm, brown, moist, packed clay in shoe		-		
					-		
4					-		
5	3.5	SM	Moist Clay, Silt & Sand material, iron staining visible throughout core		1768	38	15.2615
					1915	185	17.0549
					1872	142	16.5303
6		CH	Fat CLAY, brown, moist		1815	85	15.8349
					1804	74	15.7007
7		SP	Poorly Graded SAND with Silt, fine-grained sand, loose, orange, light brown, moist, no HCl reaction		1796	66	15.6031
					1970	240	17.7259
8	3.4	CL	Lean CLAY, brown, moist		-		
					1765	35	15.2249
					1862	132	16.4083
9		SC	Clayey SAND, light brown, orange, iron stained		1771	41	15.2981
10					1866	136	16.4571
					1796	66	15.6031
					1908	178	16.9695
11			Clayey SAND, poorly graded, fine-grained sand, medium dense, light brown, moist, no HCl reaction		1889	159	16.7377
12					-		

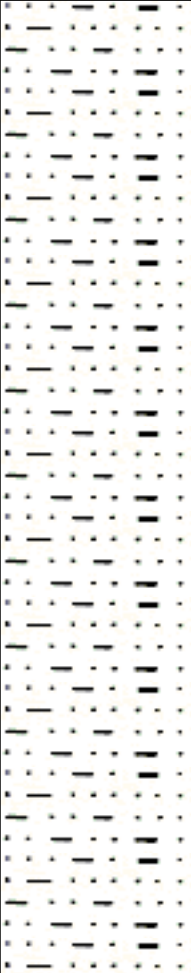
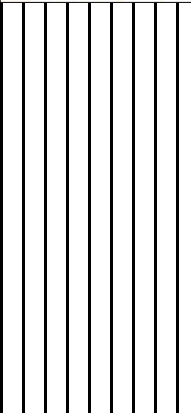
Notes:

Log of Boring SB-103

Date: 2/16/2013
 Drilling Method: Geoprobe
 Drilling Co.: EarthWorx
 Driller: L. Trujillo
 Sampling Method: Continuous/Grab

Diameter (in.): 1 3/4 Macrocore
 Logged By: C. Short
 SCAG Blank (cpm): 1752
 Bore Loc Background (cpm): 10962
 Total Depth (ft.): 4
 Total Depth Criterion: Below background



Depth (ft.)	Recovery (of 4')	Symbol	Lithology Description	Lithology	Core Gamma (cpm)	BACG (cpm)	Ra-226 (pCi/g)
0	3.2	SM	Moist Clay, Silt & Sand surface material, iron staining visible throughout core		1723	-29	14.4441
0.2					1754	2	14.8223
0.4					1731	-21	14.5417
0.6					1762	10	14.9199
0.8					1697	-55	14.1269
1					1751	-1	14.7857
1.2					-		
1.4	3.2	CH	Fat CLAY, high plasticity, firm, dark brown, moist		-		
1.6					-		
1.8					-		
2					-		
2.2					-		
2.4					-		
2.6					-		
2.8					-		
3					-		
3.2					-		
3.4					-		
3.6					-		
3.8					-		

Notes:

**ATTACHMENT I-3: 2013 INTERA INVESTIGATION SOIL BORING
LOGS**

DRAFT 2013 PHASE II SITE CHARACTERIZATION REPORT

**Old Church Rock Mine
McKinley County, New Mexico**



Prepared for:

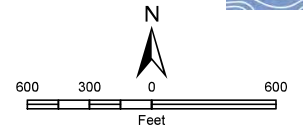
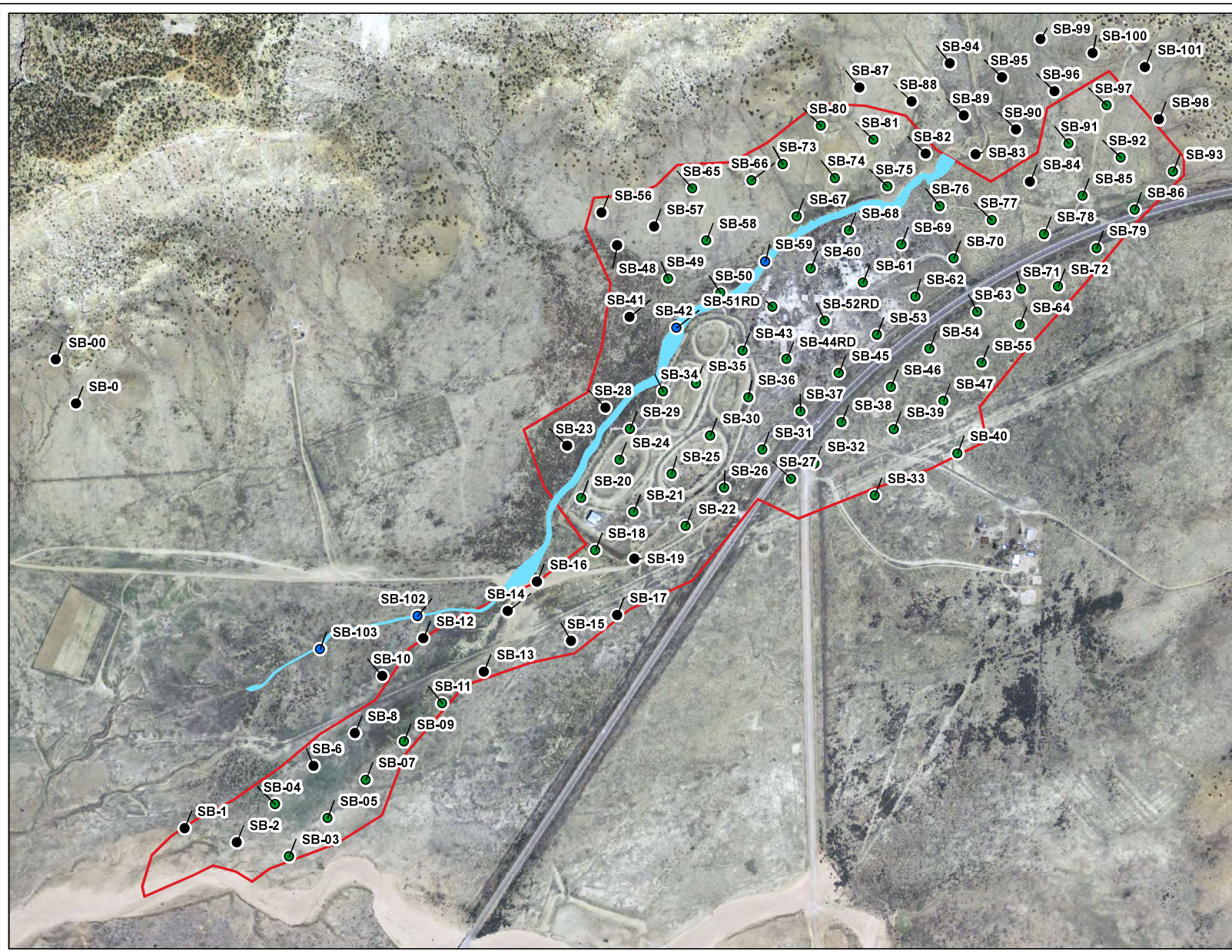
Uranium Resources, Inc.
5041 Indian School Rd. NE
Albuquerque, NM 87110

Prepared by:



INTERA Incorporated
6000 Uptown Boulevard, NE, Suite 220
Albuquerque, New Mexico 87110

September 16, 2013



Sources: NAIP 2011 orthoimagery

- Geoprobe locations
- Used in estimate
 - Separate arroyo estimate
 - Not used in estimate
 - Arroyo
 - Impacted area

Figure 5
Geoprobe Locations Used in
Soil Volume Estimate
Phase II Site Characterization Report
Old Church Rock Mine