environmental
properties management, LLC

July 6, 2017

Mr. Paul Davis
Oklahoma Department of Environmental Quality
707 North Robinson
Oklahoma City, OK 73101

Mr. Ken Kalman
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852-2738

Mr. Robert Evans
U.S. Nuclear Regulatory Commission
1600 East Lamar Blvd; Suite 400
Arlington, TX 76011-4511

Re: Docket No. 70-925; License No. SNM-928
Removal of Burial Area #2 Remediation from Decommissioning Plan

Dear Sirs:

Environmental Properties Management LLC (EPM) is currently preparing *Facility Decommissioning Plan – Rev 1*. Evaluation of contaminant concentration data obtained through quarterly groundwater monitoring through the Second Quarter 2017 has provided improved definition of the nature and extent of groundwater impacts. One aspect of this improved definition relates to the continuing decline in the concentration of uranium in Burial Area #2 (BA2), one of the areas currently targeted for active remediation.

The images presented below in Exhibits 1 and 2 were extracted from Figures 3-3 and 8-1 of the 2015 *Facility Decommissioning Plan*. The dashed magenta line indicates the approximate extent of groundwater with uranium concentrations exceeding the primary drinking water standard of 30 micrograms per liter (µg/L), based on 2015 sampling results. This standard is referred to hereafter as the maximum contaminant level, or MCL. The MCL is the limit imposed by the Oklahoma Department of Environmental Quality (DEQ) as the non-radiological cleanup standard for uranium at the Cimarron site (the Site).

Exhibit 1 shows the locations of monitor wells in and around BA2. Monitor Wells 1331 through 1333 were installed in March 1989 as part of a site-wide radiological investigation; the installation and initial sampling of these wells was reported in the 1989 *Site Investigation Report*. Additional groundwater samples were collected from these wells for laboratory analysis during development of the 1995 *Decommissioning Plan*. The collection and analysis of groundwater samples from these wells continued through the ensuing years.

Monitor Wells 1377 through 1379 were installed in November 2014 as part of the 2014 Design Investigation. The installation and initial sampling of these wells was reported in the *2014 Design Investigation Report*. Additional groundwater samples were collected from these wells for laboratory analysis in 2015 and 2017.

Exhibit 1

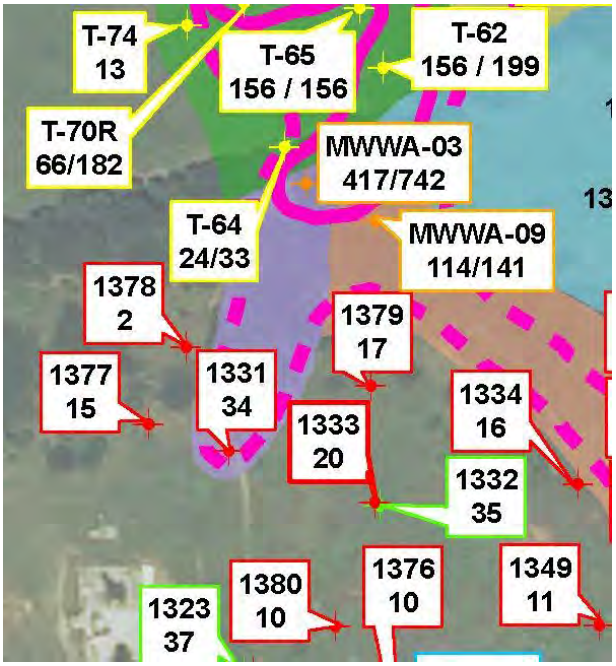
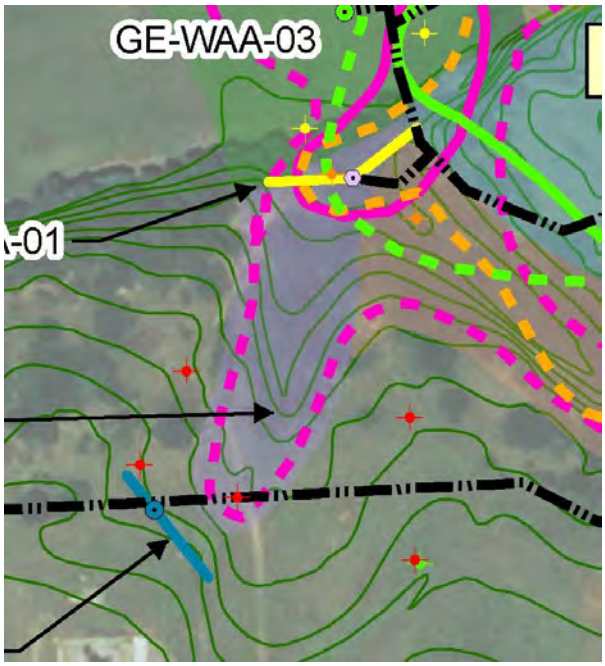


Exhibit 2



Monitor Well 1332 is screened within Sandstone C, a deeper water-bearing zone that has been demonstrated to contain groundwater yielding natural concentrations of uranium exceeding the MCL. The other five monitor wells in and around BA2 (1331, 1333, 1377, 1378, and 1379) are screened within Sandstone A, the uppermost water-bearing unit. It is anticipated that waste placed in the BA2 disposal trenches impacted the groundwater in Sandstone A; therefore, Sandstone A is the unit of interest for monitoring and remediation.

As Exhibit 1 shows, only one of the five monitor wells (Monitor Well 1331) yielded a uranium concentration exceeding the MCL in 2015. The analytical uranium concentration result for this sample, collected in April 2015, was 34 µg/L, slightly above the MCL. The extent of groundwater exceeding the uranium MCL in BA2, as depicted by the MCL iso-concentration contour shown above, was based exclusively on this MCL exceedance reported for Monitor Well 1331 (see Exhibits 1 and 2). Uranium concentrations reported for Monitor Well 1331 prior to 2015 also exceeded the MCL.

As shown in Exhibit 2, the 2015 *Facility Decommissioning Plan* included the construction and operation of a treated water injection trench (GWI-WU-02), represented by the blue line located west of Monitor Well 1331 (Exhibit 2). The blue circle near the center of the trench represents a treated water injection well installed within the trench. GWI-WU-02 was designed with a length

of approximately 177 feet and an average depth of approximately 19 feet below grade; the trench will be excavated within Sandstone A. The GWI-WU-02 trench design also provides for approximately 1,300 feet of buried piping (conveying treated water for injection) and instrumentation cable (for injection well water level monitoring) extending from the GWI-WU-02 injection well location to the Western Area Treatment Facility.

Subsequent to the April 2015 sampling event discussed above, groundwater samples were collected from Monitor Well 1331 in February, May, August, and October of 2016, and again in May 2017. The uranium concentration reported for all five of these samples (results prior to May 2017 were for U-238 only) was less than the MCL. Because groundwater concentrations fluctuate over time, the decision was made to establish "representative" uranium concentrations for each monitor well at the Site. These representative concentrations were used to develop both the basis of design and performance estimates for groundwater remediation. The following process was used to establish representative concentrations, based on data obtained from 2011 through the 2nd quarter of 2017:

- The 95-percentile of the upper confidence limit of the mean (95% UCL) was adopted as the representative concentration when the minimum number of data points required to calculate the 95% UCL (four) was available.
- If the 95% UCL calculation generated a value greater than the maximum concentration reported, the maximum concentration for this time period was adopted as the representative concentration.
- If the minimum number of samples required to calculate the 95% UCL was not available, the mean concentration was adopted as the representative concentration.

Representative uranium concentrations, determined as described above, were used to develop iso-concentration contours and refine the uranium plume delineation. For Monitor Well 1331, the representative uranium concentration is 33.7 µg/L, corresponding to the 95% UCL for concentrations reported between 2011 and Second Quarter 2017.

Because uranium concentration data for Monitor Wells 1331 and 1333 extend back nearly three decades, the decision was made to review long-term trends in uranium concentration for these and other BA2 monitor wells. Attachment 1, "Burial Area #2 Groundwater Data – Uranium in Sandstone A", lists all the uranium concentration data generated for all five monitor wells in the area around BA2. Tabulated values listed in black font represent information and/or data received from the laboratory. Values listed in red bold font represent calculated values.

The MCL is based on total uranium mass concentration, not the activity or mass concentration for the U-238 isotope. Therefore, for results reported as U-238 activity concentration only, it was necessary to convert isotopic activity concentration to total uranium concentration. The relationship between U-238 activity concentration and total uranium mass concentration is a function of the U-235 enrichment of the uranium and the U-238 activity-to-mass concentration ratio.

April 2017 groundwater samples were analyzed for both U-234 and U-238 mass concentration; this provided the data needed to calculate U-235 enrichment. This is the only time groundwater samples collected from the BA2 wells were analyzed for U-235 and U-238 mass concentration; therefore, only April 2017 data were used to calculate enrichment. The percent U-235 enrichment for each monitor well was calculated using the following equation:

$$\% \text{ Enrichment} = 100 \times (\text{U-235 } \mu g/L) \div ([\text{U-235 } \mu g/L] + [\text{U-238 } \mu g/L])$$

The uncertainty of U-235 mass concentration results is low even at the low uranium concentrations detected in the BA2 monitor wells. Isotopic activity data were not used to calculate enrichment because the uncertainty of U-235 activity concentration results is very high at the low uranium concentrations reported for BA2 monitor wells. In Attachment 1, the percent U-235 enrichment for BA1 monitor wells is as follows:

- Monitor Well 1331: 100 X (0.795 µg/L) ÷ (0.795 µg/L + 26.3 µg/L) = 2.93%
- Monitor Well 1333: 100 X (0.533 µg/L) ÷ (0.533 µg/L + 21.2 µg/L) = 2.45%
- Monitor Well 1377: 100 X (0.563 µg/L) ÷ (0.563 µg/L + 19.7 µg/L) = 2.78%
- Monitor Well 1378: 100 X (0.017 µg/L) ÷ (0.017 µg/L + 2.20 µg/L) = 0.74%
- Monitor Well 1379: 100 X (0.431 µg/L) ÷ (0.431 µg/L + 19.5 µg/L) = 2.16%

Twice (May and December 2014), groundwater from Monitor Wells 1331 and 1333 was analyzed for U-234, U-235, and U-238 activity concentration, as well as for U-238 mass concentration. The uncertainty associated with U-238 activity concentration results is relatively low even when the uncertainty for U-235 activity concentration results is high. A reasonably accurate U-238 activity-to-mass concentration ratio could therefore be determined using the May and December 2014 data sets for Monitor Wells 1331 and 1333. Individual and average U-238 activity-to-mass concentration ratio calculations for Monitor Wells 1331 and 1333 are summarized below:

- Monitor Well 1331:
  - May 2014: 12.4 pCi/L ÷ 36.7 µg/L = 0.338 pCi/µg
  - December 2014: 13.6 pCi/L ÷ 36.8 µg/L = 0.370 pCi/µg
  - Average: 0.354 pCi/µg

- Monitor Well 1333:
  - May 2014: 7.6 pCi/L ÷ 21.3 µg/L = 0.356 pCi/µg
  - December 2014: 6.0 pCi/L ÷ 16.8 µg/L = 0.358 pCi/µg
  - Average: 0.357 pCi/µg

These U-238 activity-to-mass concentration ratios, along with the U-235 enrichment percentages presented above, were applied to historical U-238 activity concentration results to calculate estimated total uranium mass concentrations. The calculation was performed by first dividing the U-238 ***activity concentration*** by the U-238 activity-to-mass concentration ratio to yield the U-238 ***mass concentration***. The ***U-238 mass concentration*** was then divided by (1 – enrichment) to yield the ***total uranium mass concentration***.

Several samples collected from BA2 monitor wells since March 2014 were analyzed for U-238 mass concentration. Only the U-235 enrichment was needed to calculate estimated total uranium mass concentration for these results. The total uranium mass concentration was calculated by dividing the U-238 mass concentration by (1 – enrichment). Since U-238 activity concentration was never reported without U-238 mass concentration for Monitor Wells 1377 through 1379, the U-238 activity-to-mass concentration ratio was not needed to calculate total uranium mass concentration for these wells.

In the past, isotopic uranium concentration was calculated by dividing the activity concentration of each isotope by its specific activity (in pCi/µg). However, the uncertainty associated with the U-235 activity concentration result is so great, these efforts proved unreliable – enrichment values based on these calculations varied widely for groundwater samples collected from the same location.

The U-234 mass concentration was not considered in the calculations described above because at natural or low enrichment values, the mass of U-234 is negligible (< 0.05% of the total uranium mass).

As shown in Attachment 1, only one groundwater sample collected from Monitor Well 1333 has yielded an estimated total uranium mass concentration exceeding the MCL and this sample was collected over 20 years ago. Groundwater samples collected from Monitor Wells 1377 through 1379 have never yielded an estimated total uranium mass concentrations exceeding the MCL (though these were not installed until 2014).

Attachment 2, "Historic Trend for Uranium Concentration Data – Monitor Well 1331" is a uranium concentration trend chart presenting the estimated total uranium mass concentration results for Monitor Well 1331. The trend chart demonstrates a long-term decline in uranium concentration, with initial concentrations consistently above 100 µg/L (from 1989 to 1996), and

recent concentrations less than 30 µg/L (in 2016 and 2017). While the potential for episodic uranium concentrations above 30 µg/L remains, the long-term decline in concentration is expected to continue.

Hundreds of thousands of dollars will be required to install, operate, monitor, and abandon the GWI-WU-02 injection system for the purpose or remediating an area that now appears to comply with the DEQ criteria for unrestricted release. Therefore, we do not feel it is necessary to implement remediation in an area in which uranium concentrations appear to now comply with the DEQ criterion for uranium in groundwater.

Based on the above-described evaluation, EPM seeks your approval to remove this component of the groundwater remediation program. Please feel free to contact me at 405-642-5152 or to e-mail me at jlux@envpm.com if you have questions or desire clarification of any of this information.

Sincerely,

Jeff Lux, P.E.
Project Manager

Attachments:

Attachment 1 – Burial Area #2 Groundwater Data – Uranium in Sandstone A

Attachment 2 – Historic Trend for Uranium Concentration Data – Monitor Well 1331

cc: NRC Document Control Desk (electronic copy only)

ATTACHMENT 1

BURIAL AREA #2 GROUNDWATER DATA – URANIUM in SANDSTONE A

ATTACHMENT 1

Burial Area #2 Groundwater Data - Uranium in Sandstone A

Sample Collection Date	Analyte	Laboratory Result	Units of Concentration	Uranium-238 Activity:Mass Concentration Ratio	Calculated Total Uranium Mass Concentration (µg/L)
Monitor Well 1331					
3/1/1989	Uranium-234	126.000	pCi/L		
3/1/1989	Uranium-235	3.700	pCi/L		
3/1/1989	Uranium-238	35.000	pCi/L		**101.94**
10/1/1989	Uranium-234	309.000	pCi/L		
10/1/1989	Uranium-235	0.850	pCi/L		
10/1/1989	Uranium-238	63.000	pCi/L		**183.49**
6/1/1990	Uranium-234	324.000	pCi/L		
6/1/1990	Uranium-235	10.500	pCi/L		
6/1/1990	Uranium-238	54.000	pCi/L		**157.28**
6/1/1991	Uranium-234	121.000	pCi/L		
6/1/1991	Uranium-235	4.560	pCi/L		
6/1/1991	Uranium-238	72.100	pCi/L		**210.00**
6/1/1992	Uranium-234	193.100	pCi/L		
6/1/1992	Uranium-235	9.000	pCi/L		
6/1/1992	Uranium-238	41.850	pCi/L		**121.89**
6/1/1993	Uranium-234	118.000	pCi/L		
6/1/1993	Uranium-235	9.300	pCi/L		
6/1/1993	Uranium-238	38.500	pCi/L		**112.13**
6/13/1994	Uranium-234	139.000	pCi/L		
6/13/1994	Uranium-235	25.100	pCi/L		
6/13/1994	Uranium-238	40.500	pCi/L		**117.96**
6/19/1995	Uranium-234	168.000	pCi/L		
6/19/1995	Uranium-235	10.800	pCi/L		
6/19/1995	Uranium-238	38.700	pCi/L		**112.72**
5/1/1996	Uranium-234	112.000	pCi/L		
5/1/1996	Uranium-235	18.500	pCi/L		
5/1/1996	Uranium-238	25.200	pCi/L		**73.40**
5/1/1996	Uranium-234	100.200	pCi/L		
5/1/1996	Uranium-235	5.230	pCi/L		
5/1/1996	Uranium-238	23.900	pCi/L		**69.61**
5/1/1996	Uranium-234	111.900	pCi/L		
5/1/1996	Uranium-235	5.460	pCi/L		
5/1/1996	Uranium-238	24.400	pCi/L		**71.07**
6/12/1997	Uranium-234	127.000	pCi/L		
6/12/1997	Uranium-235	4.700	pCi/L		
6/12/1997	Uranium-238	25.000	pCi/L		**72.81**
9/26/1997	Uranium-234	137.000	pCi/L		
9/26/1997	Uranium-235	6.700	pCi/L		
9/26/1997	Uranium-238	31.000	pCi/L		**90.29**
12/17/1997	Uranium-234	116.000	pCi/L		
12/17/1997	Uranium-235	4.500	pCi/L		
12/17/1997	Uranium-238	25.500	pCi/L		**74.27**

ATTACHMENT 1

Burial Area #2 Groundwater Data - Uranium in Sandstone A

Sample Collection Date	Analyte	Laboratory Result	Units of Concentration	Uranium-238 Activity:Mass Concentration Ratio	Calculated Total Uranium Mass Concentration (µg/L)
Monitor Well 1331 (continued)					
3/23/1998	Uranium-234	110.000	pCi/L		
3/23/1998	Uranium-235	3.200	pCi/L		
3/23/1998	Uranium-238	31.500	pCi/L		**91.75**
5/27/1998	Uranium-234	202.000	pCi/L		
5/27/1998	Uranium-235	40.400	pCi/L		
5/27/1998	Uranium-238	46.000	pCi/L		**133.98**
9/16/1998	Uranium-234	145.000	pCi/L		
9/16/1998	Uranium-235	6.200	pCi/L		
9/16/1998	Uranium-238	26.900	pCi/L		**78.35**
12/8/1998	Uranium-234	105.000	pCi/L		
12/8/1998	Uranium-235	9.100	pCi/L		
12/8/1998	Uranium-238	20.900	pCi/L		**60.87**
3/23/1999	Uranium-234	119.000	pCi/L		
3/23/1999	Uranium-235	9.400	pCi/L		
3/23/1999	Uranium-238	25.400	pCi/L		**73.98**
6/21/1999	Uranium-234	120.000	pCi/L		
6/21/1999	Uranium-235	6.100	pCi/L		
6/21/1999	Uranium-238	25.600	pCi/L		**74.56**
9/22/1999	Uranium-234	113.000	pCi/L		
9/22/1999	Uranium-235	7.900	pCi/L		
9/22/1999	Uranium-238	25.200	pCi/L		**73.40**
12/1/1999	Uranium-234	115.000	pCi/L		
12/1/1999	Uranium-235	5.230	pCi/L		
12/1/1999	Uranium-238	24.500	pCi/L		**71.36**
3/28/2000	Uranium-234	111.000	pCi/L		
3/28/2000	Uranium-235	5.560	pCi/L		
3/28/2000	Uranium-238	22.200	pCi/L		**64.66**
6/28/2000	Uranium-234	141.000	pCi/L		
6/28/2000	Uranium-235	8.510	pCi/L		
6/28/2000	Uranium-238	29.200	pCi/L		**85.05**
9/6/2000	Uranium-234	114.000	pCi/L		
9/6/2000	Uranium-235	5.150	pCi/L		
9/6/2000	Uranium-238	25.200	pCi/L		**73.40**
12/4/2000	Uranium-234	121.000	pCi/L		
12/4/2000	Uranium-235	6.330	pCi/L		
12/4/2000	Uranium-238	22.900	pCi/L		**66.62**
3/27/2001	Uranium-234	121.000	pCi/L		
3/27/2001	Uranium-235	8.720	pCi/L		
3/27/2001	Uranium-238	24.300	pCi/L		**70.78**
6/26/2001	Uranium-234	134.000	pCi/L		
6/26/2001	Uranium-235	7.760	pCi/L		
6/26/2001	Uranium-238	25.900	pCi/L		**75.44**

ATTACHMENT 1

Burial Area #2 Groundwater Data - Uranium in Sandstone A

Sample Collection Date	Analyte	Laboratory Result	Units of Concentration	Uranium-238 Activity:Mass Concentration Ratio	Calculated Total Uranium Mass Concentration (µg/L)
Monitor Well 1331 (continued)					
12/3/2001	Uranium-234	109.000	pCi/L		
12/3/2001	Uranium-235	4.470	pCi/L		
12/3/2001	Uranium-238	20.400	pCi/L		**59.42**
6/27/2002	Uranium-234	90.200	pCi/L		
6/27/2002	Uranium-235	5.730	pCi/L		
6/27/2002	Uranium-238	19.700	pCi/L		**57.38**
6/27/2002	Uranium-234	89.300	pCi/L		
6/27/2002	Uranium-235	3.130	pCi/L		
6/27/2002	Uranium-238	17.400	pCi/L		**50.68**
9/23/2002	Uranium-234	121.000	pCi/L		
9/23/2002	Uranium-235	6.870	pCi/L		
9/23/2002	Uranium-238	26.000	pCi/L		**75.73**
12/11/2002	Uranium-234	92.300	pCi/L		
12/11/2002	Uranium-235	4.900	pCi/L		
12/11/2002	Uranium-238	17.200	pCi/L		**50.10**
2/24/2003	Uranium-234	88.500	pCi/L		
2/24/2003	Uranium-235	5.170	pCi/L		
2/24/2003	Uranium-238	17.700	pCi/L		**51.55**
6/25/2003	Uranium-234	72.900	pCi/L		
6/25/2003	Uranium-235	6.780	pCi/L		
6/25/2003	Uranium-238	14.000	pCi/L		**40.78**
9/25/2003	Uranium-234	111.000	pCi/L		
9/25/2003	Uranium-235	7.660	pCi/L		
9/25/2003	Uranium-238	20.900	pCi/L		**60.87**
8/26/2004	Uranium-234	60.200	pCi/L		
8/26/2004	Uranium-235	8.310	pCi/L		
8/26/2004	Uranium-238	13.700	pCi/L		**39.90**
5/26/2005	Uranium-234	55.300	pCi/L		
5/26/2005	Uranium-235	6.150	pCi/L		
5/26/2005	Uranium-238	12.800	pCi/L		**37.28**
5/26/2005	Uranium-234	49.800	pCi/L		
5/26/2005	Uranium-235	4.540	pCi/L		
5/26/2005	Uranium-238	10.900	pCi/L		**31.75**
5/23/2006	Uranium-234	52.000	pCi/L		
5/23/2006	Uranium-235	3.070	pCi/L		
5/23/2006	Uranium-238	11.100	pCi/L		**32.33**
5/23/2006	Uranium-234	67.400	pCi/L		
5/23/2006	Uranium-235	4.050	pCi/L		
5/23/2006	Uranium-238	14.600	pCi/L		**42.52**

ATTACHMENT 1

Burial Area #2 Groundwater Data - Uranium in Sandstone A

Sample Collection Date	Analyte	Laboratory Result	Units of Concentration	Uranium-238 Activity:Mass Concentration Ratio	Calculated Total Uranium Mass Concentration (µg/L)
Monitor Well 1331 (continued)					
8/15/2007	Uranium-234	50.900	pCi/L		
8/15/2007	Uranium-235	3.470	pCi/L		
8/15/2007	Uranium-238	11.800	pCi/L		**34.37**
8/15/2007	Uranium-234	54.500	pCi/L		
8/15/2007	Uranium-235	2.730	pCi/L		
8/15/2007	Uranium-238	12.100	pCi/L		**35.24**
6/19/2008	Uranium-234	53.900	pCi/L		
6/19/2008	Uranium-235	1.550	pCi/L		
6/19/2008	Uranium-238	8.820	pCi/L		**25.69**
6/19/2008	Uranium-234	58.600	pCi/L		
6/19/2008	Uranium-235	3.150	pCi/L		
6/19/2008	Uranium-238	13.700	pCi/L		**39.90**
3/12/2014	Uranium-238	36.400	µg/L		**37.50**
5/5/2014	Uranium-234	60.600	pCi/L		
5/5/2014	Uranium-235	3.820	pCi/L		
5/5/2014	Uranium-238	12.400	pCi/L	**0.338**	**36.12**
5/5/2014	Uranium-238	36.700	µg/L		**37.81**
12/19/2014	Uranium-234	63.400	pCi/L		
12/19/2014	Uranium-235	3.530	pCi/L		
12/19/2014	Uranium-238	13.600	pCi/L	**0.370**	**39.61**
12/19/2014	Uranium-238	36.800	µg/L		**37.91**
4/1/2015	Uranium-238	33.600	µg/L		**34.62**
2/18/2016	Uranium-238	22.100	µg/L		**22.77**
5/11/2016	Uranium-238	29.200	µg/L		**30.08**
8/9/2016	Uranium-238	19.700	µg/L		**20.30**
10/17/2016	Uranium-238	25.000	µg/L		**25.76**
5/1/2017	Uranium-235	0.795	µg/L		**27.10**
5/1/2017	Uranium-238	26.300	µg/L		

ATTACHMENT 1

Burial Area #2 Groundwater Data - Uranium in Sandstone A

Sample Collection Date	Analyte	Laboratory Result	Units of Concentration	Uranium-238 Activity:Mass Concentration Ratio	Calculated Total Uranium Mass Concentration (µg/L)
Monitor Well 1333					
3/1/1989	Uranium-234	18.000	pCi/L		
3/1/1989	Uranium-235	0.710	pCi/L		
3/1/1989	Uranium-238	6.200	pCi/L		**17.81**
10/1/1989	Uranium-234	26.600	pCi/L		
10/1/1989	Uranium-235	0.910	pCi/L		
10/1/1989	Uranium-238	9.540	pCi/L		**27.41**
6/1/1990	Uranium-234	26.000	pCi/L		
6/1/1990	Uranium-235	0.610	pCi/L		
6/1/1990	Uranium-238	9.200	pCi/L		**26.43**
6/1/1991	Uranium-234	14.550	pCi/L		
6/1/1991	Uranium-235	0.020	pCi/L		
6/1/1991	Uranium-238	5.910	pCi/L		**16.98**
6/1/1992	Uranium-234	10.890	pCi/L		
6/1/1992	Uranium-235	0.490	pCi/L		
6/1/1992	Uranium-238	5.250	pCi/L		**15.08**
6/1/1993	Uranium-234	21.600	pCi/L		
6/1/1993	Uranium-235	1.600	pCi/L		
6/1/1993	Uranium-238	8.200	pCi/L		**23.56**
6/13/1994	Uranium-234	9.700	pCi/L		
6/13/1994	Uranium-235	0.200	pCi/L		
6/13/1994	Uranium-238	2.800	pCi/L		**8.04**
6/19/1995	Uranium-234	1.700	pCi/L		
6/19/1995	Uranium-235	0.200	pCi/L		
6/19/1995	Uranium-238	0.500	pCi/L		**1.44**
4/30/1996	Uranium-234	20.600	pCi/L		
4/30/1996	Uranium-235	1.060	pCi/L		
4/30/1996	Uranium-238	11.770	pCi/L		**33.82**
6/12/1997	Uranium-234	9.100	pCi/L		
6/12/1997	Uranium-235	0.300	pCi/L		
6/12/1997	Uranium-238	3.800	pCi/L		**10.92**
6/1/1998	Uranium-234	12.200	pCi/L		
6/1/1998	Uranium-235	0.800	pCi/L		
6/1/1998	Uranium-238	4.300	pCi/L		**12.35**
6/22/1999	Uranium-234	11.300	pCi/L		
6/22/1999	Uranium-235	0.300	pCi/L		
6/22/1999	Uranium-238	3.300	pCi/L		**9.48**
6/28/2000	Uranium-234	10.100	pCi/L		
6/28/2000	Uranium-235	0.400	pCi/L		
6/28/2000	Uranium-238	3.670	pCi/L		**10.54**
6/26/2001	Uranium-234	10.800	pCi/L		
6/26/2001	Uranium-235	0.563	pCi/L		
6/26/2001	Uranium-238	3.290	pCi/L		**9.45**

ATTACHMENT 1

Burial Area #2 Groundwater Data - Uranium in Sandstone A

Sample Collection Date	Analyte	Laboratory Result	Units of Concentration	Uranium-238 Activity:Mass Concentration Ratio	Calculated Total Uranium Mass Concentration (µg/L)
Monitor Well 1333 (continued)					
6/26/2002	Uranium-234	8.540	pCi/L		
6/26/2002	Uranium-235	2.100	pCi/L		
6/26/2002	Uranium-238	3.310	pCi/L		**9.51**
6/26/2002	Uranium-234	12.600	pCi/L		
6/26/2002	Uranium-235	1.000	pCi/L		
6/26/2002	Uranium-238	3.780	pCi/L		**10.86**
6/20/2003	Uranium-234	17.300	pCi/L		
6/20/2003	Uranium-235	1.150	pCi/L		
6/20/2003	Uranium-238	4.550	pCi/L		**13.07**
8/26/2004	Uranium-234	10.400	pCi/L		
8/26/2004	Uranium-235	1.120	pCi/L		
8/26/2004	Uranium-238	3.600	pCi/L		**10.34**
5/26/2005	Uranium-234	15.300	pCi/L		
5/26/2005	Uranium-235	1.140	pCi/L		
5/26/2005	Uranium-238	4.450	pCi/L		**12.79**
5/23/2006	Uranium-234	17.900	pCi/L		
5/23/2006	Uranium-235	0.709	pCi/L		
5/23/2006	Uranium-238	4.900	pCi/L		**14.08**
8/15/2007	Uranium-234	19.000	pCi/L		
8/15/2007	Uranium-235	1.160	pCi/L		
8/15/2007	Uranium-238	5.330	pCi/L		**15.31**
6/19/2008	Uranium-234	34.500	pCi/L		
6/19/2008	Uranium-235	1.540	pCi/L		
6/19/2008	Uranium-238	9.060	pCi/L		**26.03**
3/12/2014	Uranium-238	21.700	µg/L		**22.25**
5/5/2014	Uranium-234	33.600	pCi/L		
5/5/2014	Uranium-235	1.780	pCi/L		
5/5/2014	Uranium-238	7.580	pCi/L	**0.356**	**21.78**
5/5/2014	Uranium-238	21.300	µg/L		**21.84**
12/19/2014	Uranium-234	21.200	pCi/L		
12/19/2014	Uranium-235	1.280	pCi/L		
12/19/2014	Uranium-238	6.010	pCi/L	**0.358**	**17.27**
12/19/2014	Uranium-238	16.800	µg/L		**17.22**
4/1/2015	Uranium-238	19.500	µg/L		**19.99**
5/1/2017	Uranium-235	0.533	µg/L		**21.73**
5/1/2017	Uranium-238	21.200	µg/L		

ATTACHMENT 1

Burial Area #2 Groundwater Data - Uranium in Sandstone A

Sample Collection Date	Analyte	Laboratory Result	Units of Concentration	Uranium-238 Activity:Mass Concentration Ratio	Calculated Total Uranium Mass Concentration (µg/L)
Monitor Well 1377					
12/19/2014	Uranium-234	19.300	pCi/L		
12/19/2014	Uranium-235	0.915	pCi/L		
12/19/2014	Uranium-238	4.900	pCi/L		
12/19/2014	Uranium-238	14.000	µg/L		**14.40**
3/31/2015	Uranium-238	14.300	µg/L		**14.71**
5/1/2017	Uranium-235	0.563	µg/L		**20.26**
5/1/2017	Uranium-238	19.700	µg/L		
Monitor Well 1378					
12/19/2014	Uranium-234	0.974	pCi/L		
12/19/2014	Uranium-235	0.095	pCi/L		
12/19/2014	Uranium-238	0.795	pCi/L		
12/19/2014	Uranium-238	2.090	µg/L		**2.11**
4/1/2015	Uranium-238	2.430	µg/L		**2.45**
5/1/2017	Uranium-235	0.017	µg/L		**2.24**
5/1/2017	Uranium-238	2.220	µg/L		
Monitor Well 1379					
12/19/2014	Uranium-234	21.400	pCi/L		
12/19/2014	Uranium-235	0.651	pCi/L		
12/19/2014	Uranium-238	5.650	pCi/L		
12/19/2014	Uranium-238	17.700	µg/L		**18.09**
3/31/2015	Uranium-238	17.400	µg/L		**17.78**
5/1/2017	Uranium-235	0.431	µg/L		**19.93**
5/1/2017	Uranium-238	19.500	µg/L		

ATTACHMENT 2

HISTORIC TREND for URANIUM CONCENTRATION DATA – MONITOR WELL 1331

Cimarron Environmental Response Trust
Burial Area #2 Uranium Data
Monitor Well 1331