

July 29, 2003

Mr. Emilio M. Garcia  
U.S. Nuclear Regulatory Commission  
Region IV  
Harris Tower, Suite 400  
611 Ryan Plaza Drive  
Arlington, TX 76011-8064

**SUBJECT: REPORT FOR ANALYSIS OF THE WATER SAMPLES FROM  
KERR-McGEE CIMARRON FACILITY, CIMARRON,  
OKLAHOMA (INSPECTION REPORT NO. 07000925/2003001)  
[RFTA NO. 03-001]**

Dear Mr. Garcia:

The Environmental Survey and Site Assessment Program (ESSAP) of the Oak Ridge Institute for Science and Education (ORISE) received 24 water samples that were collected on June 24 and June 25, 2003 at the Kerr-McGee Cimarron facility in Cimarron, Oklahoma. All water samples were analyzed for gross alpha and beta and isotopic uranium. Tc-99 analysis was performed on the 18 designated water samples. The water results for gross alpha and beta (Procedures AP1, Revision13 and CP3 Revision1), Tc-99 (Procedure AP5, Revision 14 and Procedure CP4, Revision 2), and isotopic uranium (Procedure AP11, Revision 1 and Procedure CP2, Revision 11) are presented in Tables 1, 2, and 3 respectively.

ESSAP's Quality Control (QC) requirements were met for these analyses. The QC files are available for your review upon request.

P. O. BOX 117, OAK RIDGE, TENNESSEE 37831-0117

Operated by Oak Ridge Associated Universities for the U.S. Department of Energy



Mr. Emilio M. Garcia

-2-

July 29, 2003

Please contact me at (865) 241-3242 or Wade Ivey at (865) 576-9184 should you have any questions.

Sincerely,



Dale Condra  
Laboratory Manager  
Environmental Survey and  
Site Assessment Program

RDC:WPI:ar

Attachments

cc: T. McLaughlin, NRC/NMSS/TWFN 7F27 E. Abelquist, ORISE/ESSAP  
E. Knox-Davin, NRC/NMSS/TWFN 8A23 T. Vitkus, ORISE/ESSAP  
J. Peckenpaugh, NRC/NMSS/TWFN 7J8 G. Purdy, NRC/NMSS/TWFN 7F27  
K. Kalman, NRC/NMSS/TWFN 7F27 R. Munoz, Region IV  
File/862

Distribution approval and concurrence :	Initials	Date
Technical Management Team Member	QJB	7/29/03
Quality Manager	ATT	7/29/03

**ORISE TABLE 1**

**CONCENTRATIONS OF GROSS ALPHA AND BETA  
IN WATER SAMPLES  
BY LOW BACKGROUND ALPHA AND BETA COUNTING  
AP1, REVISION 13; CP3, REVISION 1  
CIMARRON (KERR-McGEE)  
CIMARRON, OKLAHOMA**

ESSAP Sample ID	NRC Region IV Sample ID	Concentrations (pCi/L)	
		Gross Alpha <sup>a</sup>	Gross Beta <sup>b</sup>
862W001	N-T-60-1841	35.1 ± 7.9 <sup>c</sup>	18.1 ± 4.2
862W002	N-T-53-1842	12.8 ± 4.6	21.4 ± 3.7
862W003	N-T-51-1843	12.3 ± 3.4	12.8 ± 2.9
862W004	N-T-58-1844	25.9 ± 3.6	79.2 ± 7.3
862W005	N-T-57-1845	20.7 ± 3.5	345 ± 31
862W006	N-T-54-1846	21.8 ± 5.5	820 ± 81
862W007	N-T-62-1864	31.3 ± 6.6	324 ± 34
862W008	N-1208-1847	151 ± 17	1740 ± 170
862W009	N-T-55-1848	27.8 ± 6.0	351 ± 37
862W010	N-T-56-1849	11.5 ± 2.0	118 ± 11
862W011	N-1336A-1850	74.1 ± 6.7	554 ± 48
862W012	N-1312-1851	125 ± 12	1080 ± 99
862W013	N-1315R-1852	1510 ± 90	455 ± 40
862W014	N-TMW13-1853	2070 ± 140	526 ± 49
862W015	N-1352-1854	322 ± 19	146 ± 13
862W016	N-1206-1855	108.1 ± 7.8	33.1 ± 3.4
862W017	N-1350-1856	62.8 ± 5.4	46.4 ± 4.5
862W018	N-1348-1857	104.9 ± 6.9	28.5 ± 2.9
862W019	N-1349-1858	44.2 ± 4.5	10.7 ± 1.8
862W020	N-1331-1859	89.0 ± 7.0	20.8 ± 2.5
862W021	N-1326-1860	7.5 ± 1.5	16.7 ± 2.0
862W022	N-1319C1-1861	346 ± 34	79 ± 10
862W023	N-1319B1-1862	163 ± 13	49.2 ± 5.4
862W024	N-1319A1-1863	53.0 ± 4.9	17.6 ± 2.1

<sup>a</sup>The average MDC for gross alpha for a 200 minute count using 0.05 L to 0.25 L samples is 3.4 pCi/L.

<sup>b</sup>The average MDC for gross beta for a 200 minute count using 0.05 L to 0.25 L samples is 3.6 pCi/L.

<sup>c</sup>Uncertainties represent the 95% confidence level, based on total propagated uncertainties.

**ORISE TABLE 2**

**CONCENTRATIONS OF Tc-99  
IN WATER SAMPLES  
BY LIQUID SCINTILLATION ANALYSIS  
AP5, REVISION 14; CP4, REVISION 2  
CIMARRON (KERR-McGEE)  
CIMARRON, OKLAHOMA**

<b>ESSAP Sample ID</b>	<b>NRC Region IV Sample ID</b>	<b>Tc-99<sup>a</sup> Concentrations (pCi/L)</b>
862W001	N-T-60-1841	14.4 ± 9.4 <sup>b</sup>
862W002	N-T-53-1842	20.6 ± 9.7
862W003	N-T-51-1843	9.4 ± 9.2
862W004	N-T-58-1844	125 ± 19
862W005	N-T-57-1845	615 ± 75
862W006	N-T-54-1846	1400 ± 170
862W007	N-T-62-1864	659 ± 80
862W008	N-1208-1847	1790 ± 210
862W009	N-T-55-1848	717 ± 87
862W010	N-T-56-1849	212 ± 28
862W011	N-1336A-1850	950 ± 120
862W012	N-1312-1851	1950 ± 230
862W013	N-1315R-1852	18.6 ± 9.5
862W014	N-TMW13-1853	13.0 ± 9.2
862W015	N-1352-1854	26.5 ± 9.9
862W016	N-1206-1855	12.0 ± 9.1
862W017	N-1350-1856	52 ± 12
862W018	N-1348-1857	6.5 ± 8.9

<sup>a</sup>The average MDC for Tc-99 for a 60 minute count using a 0.1 L sample is 15 pCi/L.

<sup>b</sup>Uncertainties represent the 95% confidence level, based on total propagated uncertainties.

**ORISE TABLE 3**

**CONCENTRATIONS OF URANIUM ISOTOPES  
IN WATER SAMPLES  
BY ALPHA SPECTROSCOPY  
AP11, REVISION 1; CP2, REVISION 11  
CIMARRON (KERR-McGEE)  
CIMARRON, OKLAHOMA**

ESSAP Sample ID	NRC Region IV Sample ID	Radionuclide Concentrations <sup>a</sup> (pCi/L)			
		U-234	U-235	U-238	U Total <sup>b</sup>
862W001	N-T-60-1841	12.9 ± 1.4 <sup>c</sup>	0.52 ± 0.24	6.98 ± 0.90	20.4 ± 1.7
862W002	N-T-53-1842	9.1 ± 1.0	0.28 ± 0.18	4.54 ± 0.67	13.9 ± 1.3
862W003	N-T-51-1843	14.3 ± 1.4	0.72 ± 0.32	8.23 ± 0.97	23.3 ± 1.8
862W004	N-T-58-1844	19.4 ± 1.7	1.01 ± 0.29	5.91 ± 0.74	26.3 ± 1.9
862W005	N-T-57-1845	14.4 ± 1.5	0.75 ± 0.27	4.48 ± 0.66	19.6 ± 1.6
862W006	N-T-54-1846	3.93 ± 0.67	0.12 ± 0.17	2.35 ± 0.48	6.40 ± 0.84
862W007	N-T-62-1864	3.90 ± 0.61	0.14 ± 0.11	2.49 ± 0.47	6.52 ± 0.78
862W008	N-1208-1847	2.35 ± 0.48	0.13 ± 0.14	0.55 ± 0.22	3.03 ± 0.55
862W009	N-T-55-1848	2.78 ± 0.61	0.10 ± 0.15	2.17 ± 0.48	5.05 ± 0.79
862W010	N-T-56-1849	1.85 ± 0.50	0.02 ± 0.19	1.20 ± 0.36	3.07 ± 0.65
862W011	N-1336A-1850	18.1 ± 1.9	0.72 ± 0.28	6.20 ± 0.88	25.0 ± 2.1
862W012	N-1312-1851	23.9 ± 2.2	1.03 ± 0.33	8.6 ± 1.1	33.5 ± 2.5
862W013	N-1315R-1852	1,250 ± 94	72.0 ± 6.0	803 ± 60	2,130 ± 110
862W014	N-TMW13-1853	1,327 ± 98	78.2 ± 6.4	820 ± 60	2,230 ± 110
862W015	N-1352-1854	199 ± 16	11.8 ± 1.5	250 ± 20	461 ± 25
862W016	N-1206-1855	93.3 ± 7.3	4.59 ± 0.74	24.4 ± 2.2	122.3 ± 7.7
862W017	N-1350-1856	45.5 ± 3.8	2.58 ± 0.54	10.5 ± 1.2	58.6 ± 4.1
862W018	N-1348-1857	92.5 ± 6.9	3.95 ± 0.65	28.8 ± 2.5	125.3 ± 7.4
862W019	N-1349-1858	57.8 ± 4.6	2.84 ± 0.55	8.9 ± 1.0	69.6 ± 4.7
862W020	N-1331-1859	79.1 ± 6.4	4.13 ± 0.76	15.4 ± 1.6	98.6 ± 6.6
862W021	N-1326-1860	3.69 ± 0.60	0.14 ± 0.11	2.22 ± 0.44	6.06 ± 0.76
862W022	N-1319C1-1861	190 ± 14	8.9 ± 1.1	29.3 ± 2.6	228 ± 15
862W023	N-1319B1-1862	161 ± 12	7.8 ± 1.0	23.6 ± 2.2	192 ± 12
862W024	N-1319A1-1863	38.8 ± 3.4	1.80 ± 0.46	6.49 ± 0.88	47.1 ± 3.5

<sup>a</sup>The average MDC for individual uranium isotopes for a sixteen hour count using 0.1 L of sample is 0.3 pCi/L.

<sup>b</sup>U Total is the sum of U-234 + U-235 + U-238.

<sup>c</sup>Uncertainties represent the 95% confidence level, based on total propagated uncertainties.