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Vegetation at Low-Level Radioactive
Waste Disposal Area G during the
1997 Growing Season*

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*P. R. Fresquez
R. J. Wechsler
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RADIONUCLIDE CONCENTRATIONS IN SOILS AND VEGETATION AT LOW-LEVEL RADIOACTIVE WASTE DISPOSAL AREA G DURING THE 1997 GROWING SEASON

by

P. R. Fresquez, R. J. Wechsler, and L. Naranjo, Jr.

ABSTRACT

Soil and overstory and understory vegetation (washed and unwashed) collected at eight locations within and around Area G—a low-level radioactive solid-waste disposal facility at Los Alamos National Laboratory—were analyzed for ^3H , ^{238}Pu , ^{239}Pu , ^{137}Cs , ^{234}U , ^{235}U , ^{238}U , $^{\text{tot}}\text{U}$ (calculated), ^{228}Ac , ^7Be , ^{214}Bi , ^{60}Co , ^{40}K , ^{54}Mn , ^{22}Na , ^{214}Pb , and ^{208}Tl . In general, most radionuclide concentrations, with the exception of ^3H and ^{239}Pu , in soils and overstory and understory vegetation collected from within and around Area G were within upper (95%) level background concentrations. Although ^3H concentrations in vegetation from most sites were significantly higher than background ($>2\text{ pCi mL}^{-1}$), concentrations decreased markedly in comparison to last year's results. The highest ^3H concentration in vegetation was detected from a juniper tree that was growing over tritium shaft #150; it contained $530,000\text{ pCi }^3\text{H mL}^{-1}$. Also, as in the past, the transuranic waste pad area contained the highest levels of ^{239}Pu in soils and in understory vegetation as compared to other areas at Area G.

I. INTRODUCTION

Solid radioactive wastes have been buried by Los Alamos National Laboratory (LANL) since the early 1940s (Purtymun et al. 1980). Area G—a 25.5-hectare (63-acre) low-level radioactive waste management and disposal area located on the east end of Mesa del Buey at Technical Area (TA) 54—was established in 1957 and, at present, is the Laboratory's primary radioactive-solid-waste burial and storage site (Soholt 1990) (Figure 1). In

general, wastes (contaminated equipment, paper, plastics, clothing, building materials, soils, and process wastes) are placed in either pits, trenches, or shafts and then covered with fill material (Hanson et al. 1980). Tritium, uranium, plutonium, and a variety of fission and activation products are the main isotopes in waste materials deposited at Area G (U.S. DOE 1979).

As part of the Environmental Surveillance Program at LANL, air

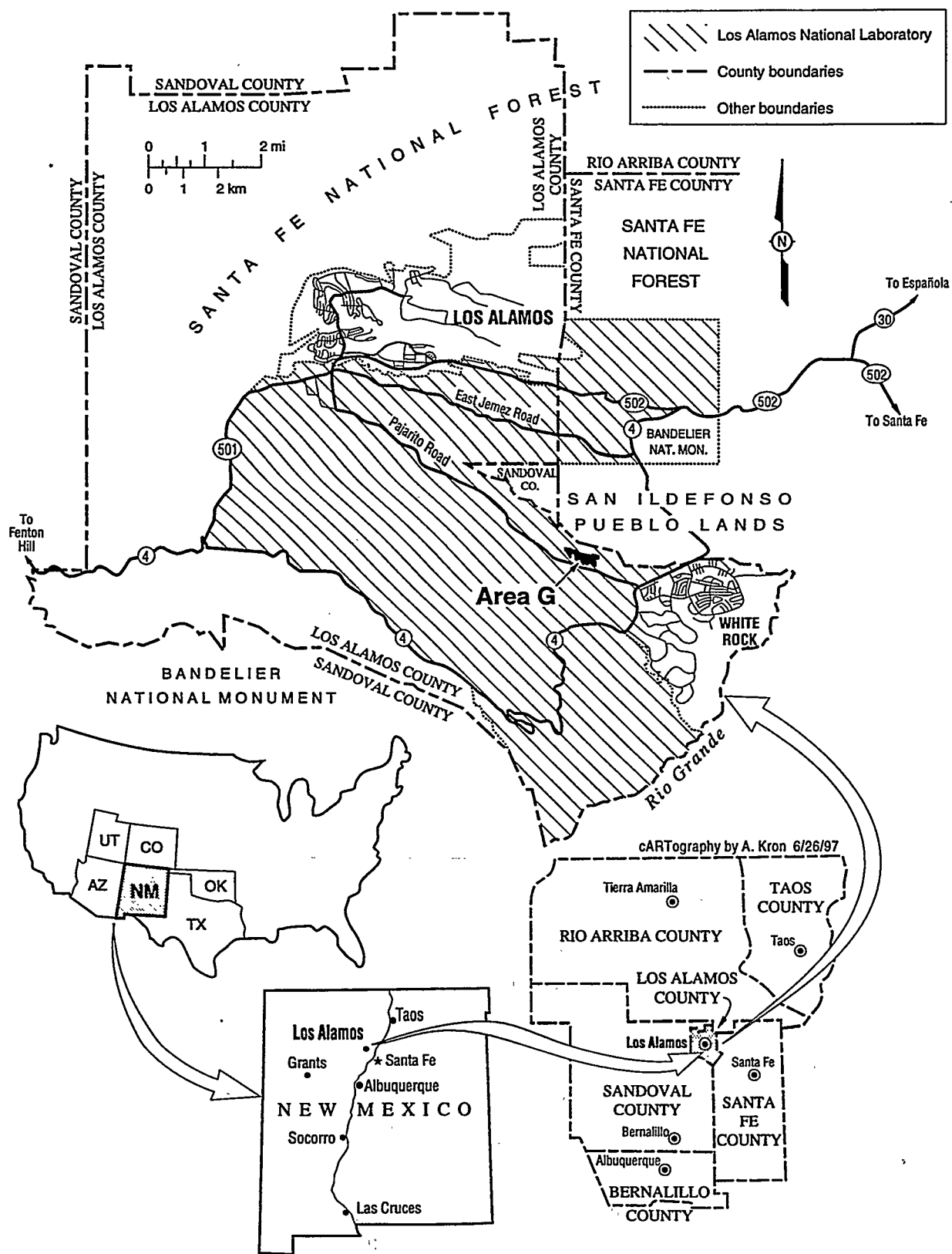


Figure 1. The location of Area G at Los Alamos National Laboratory.

(ESP 1997), water (Mullen et al. 1996), soils/sediment (Conrad et al. 1995, 1996; Fresquez et al. 1996a, 1997a), vegetation (Fresquez et al. 1995, 1996b, 1997a), small mammals (Biggs et al. 1995, Bennett et al. 1996, Biggs et al. 1997), and bees and honey (Fresquez et al. 1997b) are collected from within and around radioactive waste disposal site Area G on an annual basis to help monitor and assess the site's impact on the surrounding environment. Two important components of this program are the assessments of soil and vegetation within and around Area G for radiological contamination.

A soil sampling program, for example, is the most direct means of determining the types, concentration, and distribution of radionuclides in the environment within and around nuclear facilities (Fresquez et al. 1998). Soil provides an integrating medium (reservoir) that can account for contaminants released to the atmosphere, either directly from gaseous effluents (air stack emissions) or indirectly from the resuspension of on-site contamination (fugitive dust) (Healy 1977). Subsequently, the knowledge gained from a soil radiological surveillance program is critical for providing information about potential pathways (e.g., soil ingestion, food crops, resuspension into the air, and contamination of groundwater) that may

result in a radiation dose to humans (Hakonson et al. 1981). The uptake of isotopes by vegetation may also give some insight into surface (Hanson et al. 1980) and subsurface (Wenzel et al. 1987) contaminant pathways to humans from waste disposal areas. Trees, in particular, have been shown to be excellent indicators of subterranean tritium migration out of low-level radioactive waste disposal sites (Rickard and Kirby 1987).

The objective of this annual study is to determine the concentrations of selected radionuclides in soil (surface) and in washed and unwashed overstory and understory vegetation within (inside the fence) and around (outside the fence) Area G during the 1997 growing season. These data were compared with radionuclide concentrations in soils and vegetation collected from background locations.

II. METHODS

In June of 1997, the Soils, Foodstuffs, and Biota Environmental Contaminant Surveillance Program Team of LANL's Ecology Group (ESH-20) collected eight soil-surface and 12 vegetation samples from areas within and around Area G at TA-54 (Figure 2). The eight sampling locations were (#1) south of the tritium shafts just outside the fence, (#2) west of the (high level) tritium shafts just outside the fence, (#3)

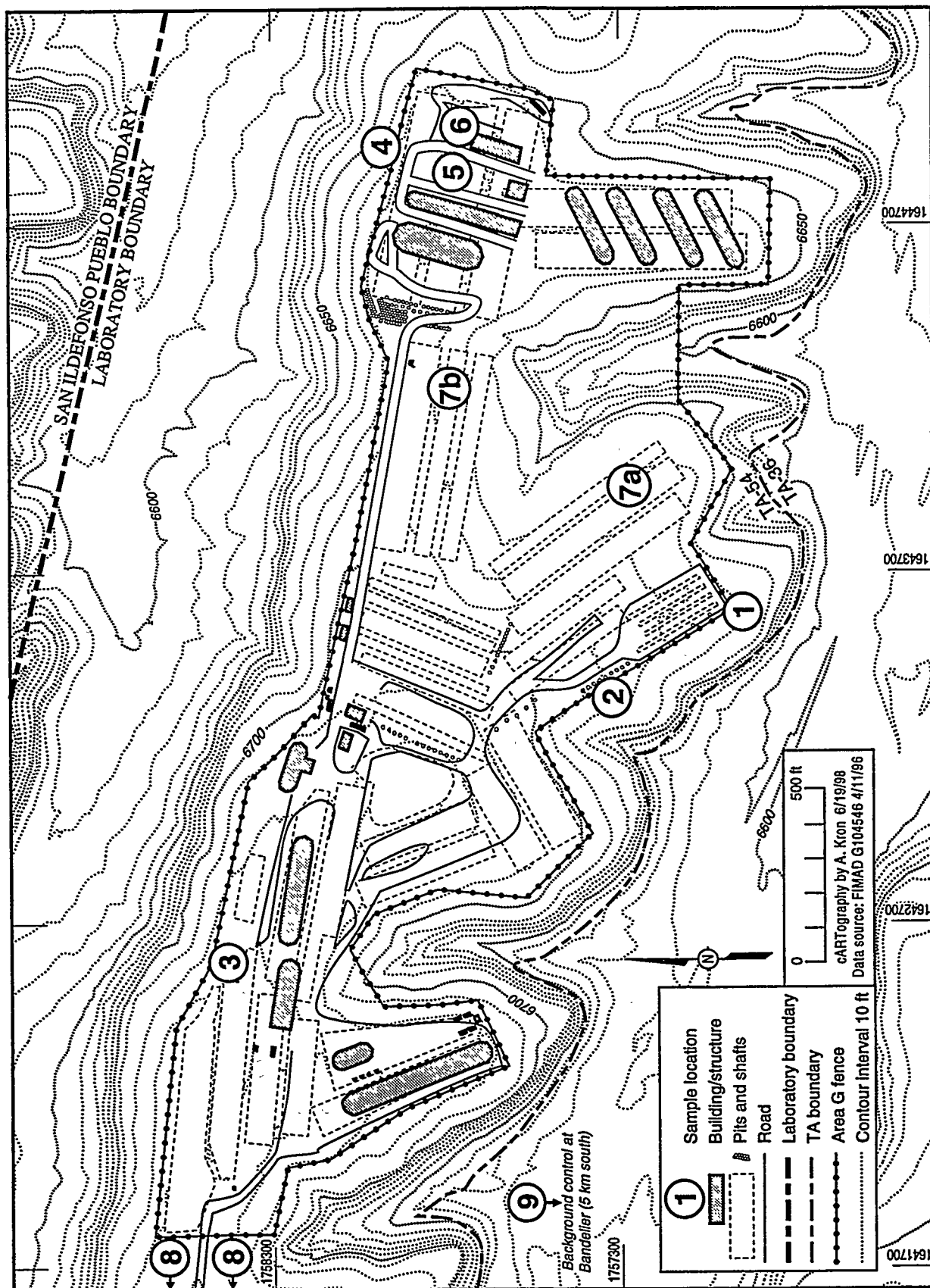


Figure 2. Site/sample locations of soils and vegetation at Area G. (Site #8 is located farther west and Site #9 is located farther south than what is shown here.)

herbivore pathway that would be attributable to Area G operations (re-suspension of soil [contaminated] particles onto plant surfaces by traffic is but one of these activities). Each sample was then divided further into two subsets to provide analysis material for tritium and other radionuclides.

Subsamples for ^3H analysis were placed in a glass beaker apparatus to collect distillate water (Salazar 1984). The rest of the subsample set(s) were placed in 1-L glass beakers and slowly ashed at 500°C for 120 h; after ashing, the sample was pulverized and homogenized, transferred to labeled 500-mL poly bottles, and submitted with the distillate (water) samples under full chain-of-custody to CST-9 for the analysis of ^3H , ^{238}Pu , ^{239}Pu , ^{137}Cs , ^{57}Co , ^{234}U , ^{235}U , ^{238}U , ^{235}U (calculated), ^{228}Ac , ^7Be , ^{214}Bi , ^{60}Co , ^{40}K , ^{54}Mn , ^{22}Na , ^{212}Pb , ^{214}Pb , ^{241}Am and ^{208}Tl . All methods of radiochemical analyses have been described previously (Fresquez et al. 1996b). Radionuclide results were reported in pCi mL^{-1} (of tissue moisture) for ^3H , $\mu\text{g g}^{-1}$ ash for ^{238}U , and pCi g^{-1} ash for all the other isotopes. Results in grams of ash are usually two to four orders of magnitude higher than live (wet) weight.

III. RESULTS

Radionuclide Concentrations in Soil. Results of radionuclide

concentrations in soil can be found in Table 1. The actual CST-9 analytical reports are included in Appendix A for reference. In general, most radionuclide concentrations in surface soils collected from within and around Area G, with the exception of ^3H , ^{238}Pu , and ^{239}Pu , were within or just above regional statistical reference levels (RSRLs). The RSRL is the upper (95%) level background concentration (mean + two standard deviations) from soils collected from regional locations from 1993 to 1997 (ESP 1998).

Surface soil collected near the ^3H shafts (sites #1 and #2) contained the highest levels of ^3H , and the highest concentrations of ^{238}Pu and ^{239}Pu were detected in soils collected on the north side of the TRU pads just outside the fence (site #4). Also, ^{238}Pu and ^{239}Pu were detected in high concentrations, as compared to background, in soils associated with the easternmost TRU pad (site #6). All radionuclides, including ^3H and Pu, in soils collected from the Area G vicinity, however, were far below LANL screening action levels (SALs)—a concentration derived from residential exposure assumptions and a 10-mrem y^{-1} dose limit (FIMAD 1997)—and, therefore, are considered of no concern.

Radionuclide Concentrations in Vegetation. Results of radionuclide concentrations in washed and unwashed

vegetation collected from within and around Area G during the 1997 growing season are presented in Tables 2 and 3, respectively. The CST-9 analytical reports are included in Appendix B for washed vegetation and Appendixes C and D for unwashed vegetation for reference. In general, radionuclide concentrations varied considerably between washed and unwashed vegetation; based on two years of data (1996 and 1997), unwashed vegetation from most sites, as expected, were markedly higher in most radionuclide constituents than washed vegetation. Radionuclides in/on vegetation are mostly a result of soil deposition from wind movement and/or from rain drop splash rather than from root uptake (Watters et al. 1983).

Most radionuclide concentrations, with the exception of ^3H and ^{239}Pu , in washed and unwashed overstory and understory vegetation collected from within and around Area G were within or just above RSRLs (Tables 2 and 3, respectively). RSRLs (mean + two std dev) were calculated from data collected from 1994 to 1997 (Fresquez et al. 1995, Fresquez et al. 1996b, Fresquez et al. 1997b). As in past years, concentrations of ^3H in overstory and understory vegetation from the ^3H shaft field (sites #1 and #2) and, especially from the TRU waste pad area (sites #5 and #6), were markedly

higher than RSRLs (Tables 2 and 3). Overall, however, the highest ^3H concentration—530,000 pCi mL⁻¹—in vegetation collected at Area G in 1997 was detected from a juniper tree that was growing over tritium shaft #150 (the data is attached in Appendix A).

Table 4 shows results of ^3H and ^{239}Pu in unwashed vegetation at selected sites at Area G over time. Tritium in vegetation collected at sites #1, #2, #5, and #6 generally shows increasing trends from 1994 to 1996, and then markedly declined in concentration in 1997. The very sharp decrease in ^3H concentrations in 1997 as compared to past years is not completely known, but may be due to the difference in time of sampling and/or to the amount of precipitation received at the Area G site. Last year's samples, for example, were collected in July and the total amount of precipitation received (ten) days prior to sampling was approximately one inch, whereas samples collected in June of 1997 only 0.3 inches of rainfall was received (ten) days prior to sampling. The very high ^3H concentration (530,000 pCi mL⁻¹), on the other hand, that was detected in a juniper tree growing over tritium shaft #150 this year, although the sample was collected in July, was probably more a function of root penetration into the source, rather than being precipitation driven (total precipitation ten days prior to sampling of the juniper tree growing

over tritium shaft #150 was only 0.1 inches). Finally, ^{239}Pu in vegetation, particularly unwashed, at most sites over time remained unchanged from 1994 to 1996 and then increased in 1997 (Table 4)—this increase was probably more a result of soil particles (dust) on the vegetation itself because of the lack of rainfall than a function of root uptake. Pu is very insoluble and is not translocated very readily by plants (Whicker and Schultz 1982).

IV. ACKNOWLEDGMENT

Thanks to Paul Torrez, an undergraduate student, for his help in tabulating the data.

Table 1. Radionuclide concentrations in soils (dry weight) collected from Area G in 1997.¹

Element	#1	#2	#3	#4	#5	#6	#7b	#8	BG	RSRL	SAL ⁴
³ H (pCi/mL) ²	36.90 (1.14) ⁶	49.79 (1.49)	0.52 (0.21)	1.07 (0.23)	12.81 (0.51)	11.37 (0.47)	1.78 (0.24)	-0.13 (0.38)	-0.45 (0.23)	1.06 ²	260.0
²³⁸ Pu (pCi/g)	0.005 (0.001)	0.004 (0.001)	0.019 (0.002)	0.246 (0.008)	0.007 (0.001)	0.135 (0.006)	0.004 (0.001)	0.008 (0.001)	0.001 (0.001)	0.010 ²	27.0
²³⁹ Pu (pCi/g)	0.025 (0.002)	0.024 (0.002)	0.052 (0.003)	0.460 (0.013)	0.026 (0.002)	0.294 (0.010)	0.017 (0.002)	0.357 (0.010)	0.018 (0.002)	0.021 ²	24.0
²³⁴ U (pCi/g)	0.823 (0.035)	0.917 (0.039)	0.960 (0.041)	0.897 (0.040)	1.020 (0.044)	0.888 (0.041)	0.870 (0.042)	0.865 (0.044)	0.812 (0.040)	1.526 ³	13.0
²³⁵ U (pCi/g)	0.030 (0.005)	0.031 (0.006)	0.033 (0.006)	0.051 (0.007)	0.045 (0.007)	0.037 (0.007)	0.034 (0.007)	0.016 (0.005)	0.019 (0.005)	0.067 ³	10.0
²³⁸ U (pCi/g)	0.880 (0.037)	0.965 (0.040)	1.122 (0.046)	0.947 (0.041)	0.984 (0.042)	0.945 (0.043)	0.964 (0.046)	0.949 (0.046)	0.950 (0.045)	1.400 ³	67.0
¹⁰⁹ Ag (μg/g) ⁷	2.65 (0.11)	2.90 (0.12)	3.37 (0.14)	2.86 (0.13)	2.97 (0.13)	2.85 (0.13)	2.90 (0.14)	2.85 (0.14)	2.85 (0.14)	3.16 ²	29.0
²²⁸ Ac (pCi/g)	1.82 (0.20)	1.76 (0.20)	1.76 (0.19)	1.54 (0.18)	2.04 (0.22)	1.74 (0.20)	1.39 (0.16)	1.53 (0.18)	1.56 (0.18)	1.87 ³	
⁷ Be (pCi/g)	27.18 (5.77)	14.00 (21.00)	25.95 (5.39)	37.87 (6.66)	24.00 (36.00)	31.00 (46.50)	27.00 (40.50)	39.00 (58.50)	25.57 (5.66)	36.89 ³	
²¹⁴ Pb (pCi/g)	1.46 (0.14)	1.49 (0.15)	1.39 (0.14)	1.37 (0.14)	1.57 (0.16)	1.53 (0.15)	1.33 (0.13)	1.47 (0.15)	1.41 (0.14)	1.76 ³	
⁵⁷ Co (pCi/g)	0.02 (0.03)	0.09 (0.14)	0.06 (0.09)	-0.01 (0.75)	0.08 (0.12)	0.00 (0.75)	-0.02 (0.75)	0.11 (0.16)	0.02 (0.03)	0.08 ³	
⁶⁰ Co (pCi/g)	-0.04 (0.05)	0.08 (0.02)	-0.05 (0.05)	-0.04 (0.05)	-0.04 (0.05)	-0.05 (0.05)	-0.05 (0.05)	-0.02 (0.05)	-0.02 (0.05)	0.19 ³	1.1
¹³⁷ Cs (pCi/g)	0.41 (0.04)	0.40 (0.04)	0.62 (0.06)	0.50 (0.05)	0.11 (0.02)	0.15 (0.23)	0.17 (0.02)	0.40 (0.04)	0.58 (0.05)	0.60 ²	5.1
⁴⁰ K (pCi/g)	24.20 (2.08)	25.46 (2.18)	22.99 (1.99)	23.45 (2.02)	31.19 (2.61)	30.18 (2.54)	20.12 (1.78)	21.58 (1.89)	18.42 (1.65)	22.55 ³	12.0

Table 1 (Cont.).

Element	#1	#2	#3	#4	#5	#6	#7b	#8	BG	RSRL	SAL ⁴
⁵⁵ Mn (pCi/g)	0.15 (0.03)	0.15 (0.03)	0.12 (0.02)	0.09 (0.02)	0.17 (0.03)	0.08 (0.02)	0.10 (0.02)	0.19 (0.03)	0.11 (0.03)	0.15 ³	3.5
²² Na (pCi/g)	0.05 (0.01)	0.12 (0.18)	0.05 (0.07)	0.02 (0.02)	0.01 (0.02)	0.07 (0.02)	-0.01 (0.05)	0.09 (0.02)	0.02 (0.01)	0.23 ³	1.3
²¹² Pb (pCi/g)	1.69 (0.16)	1.93 (0.17)	1.59 (0.15)	1.68 (0.15)	1.96 (0.18)	1.98 (0.18)	1.51 (0.14)	1.65 (0.16)	1.57 (0.15)	1.87 ³	
²¹⁴ Pb (pCi/g)	1.28 (0.12)	1.40 (0.14)	1.28 (0.12)	1.23 (0.12)	1.52 (0.15)	1.47 (0.14)	1.16 (0.11)	1.44 (0.13)	1.51 (0.14)	2.01 ³	
²⁰⁸ Tl (pCi/g)	0.53 (0.06)	0.70 (0.07)	0.60 (0.06)	0.64 (0.07)	0.69 (0.07)	0.67 (0.07)	0.54 (0.06)	0.55 (0.06)	0.60 (0.06)	0.69 ³	
²⁴¹ Am (pCi/g)	0.007 (0.001)	0.008 (0.004)	0.015 (0.006)	0.113 (0.007)	0.013 (0.002)	0.007 (0.002)	0.011 (0.002)	0.007 (0.003)	0.007 (0.003)	0.011 ²	

¹#1=tritium shafts (south of the shafts just outside the fence), #2=tritium shafts (west of the shafts just outside the fence), #3=waste pits (east of the new pit inside the fence), #4=TRU waste pads (north of pads #3 and 4 just outside the fence), #5=TRU waste pad #3, #6=TRU waste pad #4, #7a=Pits #17 and 18 (southeastern portions) (not sampled in 1997), #7b=Pits (eastern end), #8=expansion area, and BG=background (south and upwind of LANL).

²Regional Statistical Reference Level; this is the upper (95%) level background concentrations (mean + 2 std dev) from 1993-1997 (ESR 1998).

³Regional Statistical Reference Level; this is the upper (95%) level background concentrations (mean + 2 std dev) from 1996-1997 (BG).

⁴Screening Action Level (FIMAD 1997).

⁵soil moisture.

⁶(± one counting uncertainty).

⁷Total U was calculated from U isotope activity.

Table 2. Radionuclide concentrations in washed vegetation collected from Area G in 1997.

Nuclide	#1 ¹	#2	#3	#4	#5	#6	#7b	#8	BG	RSRL ²
³ H (pCi mL ⁻¹) ³										
OS ⁴	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.8
US	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.9
²³⁸ Pu (pCi g ⁻¹ ash)										
OS	0.005	0.003	0.014	0.015				0.000	0.001	0.003
	(0.001) ⁵	(0.001)	(0.002)	(0.002)				(0.001)	(0.001)	
US	0.001	0.001	0.003	0.021	0.003	0.005	0.004	0.000	0.000	0.003
	(0.000)	(0.000)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.000)	(0.000)	
²³⁹ Pu (pCi g ⁻¹ ash)										
OS	0.013	0.032	0.107	0.120				0.019	0.004	0.004
	(0.002)	(0.002)	(0.007)	(0.005)				(0.002)	(0.001)	
US	0.006	0.008	0.021	0.057	0.031	0.032	0.082	0.007	0.003	0.003
	(0.001)	(0.001)	(0.003)	(0.004)	(0.003)	(0.004)	(0.004)	(0.001)	(0.001)	
²³⁴ U (pCi g ⁻¹ ash)										
OS	0.263	0.278	1.048	0.416				0.213	0.165	0.225
	(0.015)	(0.015)	(0.052)	(0.022)				(0.014)	(0.011)	
US	0.163	0.192	0.149	0.172	0.326	0.379	0.142	0.137	0.134	0.236
	(0.011)	(0.012)	(0.011)	(0.012)	(0.019)	(0.020)	(0.009)	(0.008)	(0.010)	
²³⁵ U (pCi g ⁻¹ ash)										
OS	0.010	0.010	0.036	0.015				0.004	0.005	0.013
	(0.002)	(0.002)	(0.005)	(0.003)				(0.002)	(0.001)	
US	0.003	0.008	0.004	0.004	0.009	0.013	0.006	0.006	0.003	0.015
	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	

Table 2 (Cont.).

Nuclide	#1 ¹	#2	#3	#4	#5	#6	#7b	#8	BG	RSRL
²³⁸ U (pCi g ⁻¹ ash)										
OS	0.254 (0.015)	0.280 (0.016)	0.865 (0.044)	0.350 (0.019)				0.188 (0.013)	0.151 (0.010)	0.274
US	0.116 (0.008)	0.158 (0.010)	0.127 (0.010)	0.147 (0.010)	0.266 (0.017)	0.325 (0.017)	0.123 (0.009)	0.114 (0.007)	0.092 (0.007)	0.213
²³² Th (μg g ⁻¹ ash) ⁶										
OS	0.765 (0.046)	0.843 (0.049)	2.607 (0.134)	1.055 (0.058)				0.565 (0.040)	0.454 (0.030)	0.826
US	0.349 (0.024)	0.477 (0.031)	0.382 (0.031)	0.442 (0.030)	0.801 (0.052)	0.979 (0.052)	0.371 (0.028)	0.344 (0.021)	0.277 (0.021)	0.664
²²⁸ Ac (pCi g ⁻¹ ash)										
OS	1.18 (0.22)	1.72 (0.38)	1.33 (0.33)	1.25 (0.28)				1.16 (1.73)	1.12 (0.24)	4.04
US	2.44 (3.66)	1.89 (0.31)	2.90 (0.60)	2.75 (0.55)	3.38 (0.58)	2.31 (0.43)	1.63 (0.32)	1.50 (0.30)	3.67 (0.67)	3.90
⁷ Be (pCi g ⁻¹ ash)										
OS	58.09 (5.93)	74.65 (7.48)	3.25 (10.17)	65.01 (6.62)				72.42 (7.46)	78.30 (7.55)	88.7
US	81.52 (8.43)	42.88 (4.52)	21.75 (2.83)	47.27 (5.39)	58.43 (6.35)	54.85 (5.43)	38.69 (4.48)	29.98 (3.36)	52.37 (5.89)	34.1
²¹⁴ Pb (pCi g ⁻¹ ash)										
OS	0.60 (0.90)	1.23 (0.21)	0.80 (1.19)	0.75 (0.19)				0.79 (0.18)	0.86 (0.16)	2.97
US	1.08 (0.22)	0.76 (0.19)	-0.07 (0.33)	1.62 (0.29)	0.53 (0.16)	1.03 (0.24)	1.35 (0.23)	0.91 (1.37)	1.44 (0.34)	2.18

Table 2 (Cont.).

Nuclide	#1 ¹	#2	#3	#4	#5	#6	#7b	#8	BG	RSRL
⁵⁷ Co (pCi g ⁻¹ ash)										
OS	0.37 (0.00)	0.34 (0.07)	0.68 (0.11)	0.44 (0.00)				0.32 (0.00)	0.15 (0.03)	0.35
US	0.29 (0.06)	0.47 (0.00)	0.75 (0.10)	0.31 (0.00)	0.61 (0.00)	0.53 (0.08)	0.31 (0.05)	0.20 (0.00)	0.90 (0.00)	0.63
⁵⁸ Co (pCi g ⁻¹ ash)										
OS										
US										
⁶⁰ Co (pCi g ⁻¹ ash)										
OS	0.26 (0.39)	0.31 (0.47)	1.16 (1.74)	0.59 (0.13)				0.71 (0.14)	0.65 (0.98)	
US	0.82 (1.23)	0.42 (0.63)	0.44 (0.66)	0.64 (0.15)	1.52 (2.27)	0.60 (0.90)	0.21 (0.31)	0.18 (0.27)	1.54 (2.31)	1.00
¹³⁷ Cs (pCi g ⁻¹ ash)										
OS	0.15 (0.22)	0.16 (0.23)	0.75 (0.16)	0.40 (0.60)				-0.13 (1.80)	-0.02 (1.80)	0.84
US	0.49 (0.73)	0.29 (0.09)	0.44 (0.66)	0.79 (0.18)	0.65 (0.14)	0.16 (0.24)	-0.05 (1.80)	0.22 (0.32)	0.58 (0.87)	
⁴⁰ K (pCi g ⁻¹ ash)										
OS	96.96 (9.47)	2.72 (10.02)	16.59 (11.90)	95.09 (9.58)				94.90 (9.61)	12.31 (10.62)	214.0
US	83.10 (32.57)	2.59 (17.4)	21.88 (19.82)	76.70 (16.58)	59.80 (23.19)	56.09 (21.05)	79.79 (15.83)	92.77 (16.35)	7.96 (34.31)	238.0
⁵⁴ Mn (pCi g ⁻¹ ash)										
OS	0.14 (0.05)	-0.12 (0.00)	0.40 (0.00)	-0.08 (0.00)				-0.13 (0.00)	0.27 (0.00)	01.46
US	-0.08 (0.00)	-0.08 (0.00)	-0.14 (0.00)	0.22 (0.08)	-0.17 (0.00)	0.27 (0.07)	-0.08 (0.00)	-0.12 (0.00)	0.48 (0.13)	0.46

Table 2 (Cont.).

Nuclide	#1 ¹	#2	#3	#4	#5	#6	#7b	#8	BG	RSRL
²¹⁴ Pb (pCi g ⁻¹ ash)										
OS	0.66 (0.13)	1.46 (0.24)	2.46 (0.37)	0.66 (0.15)				0.68 (0.14)	0.75 (0.18)	
US	1.62 (0.31)	0.83 (1.24)	0.65 (0.98)	2.05 (0.35)	1.49 (0.26)	1.76 (0.24)	1.49 (0.23)	0.52 (0.10)	2.21 (0.34)	1.95
²⁰⁸ Tl (pCi g ⁻¹ ash)										
OS	0.65 (0.12)	0.39 (0.25)	0.69 (0.14)	0.46 (0.11)				0.43 (0.27)	0.32 (0.09)	0.64
US	0.59 (0.38)	0.34 (0.09)	0.67 (0.43)	0.46 (0.10)	0.92 (0.17)	0.76 (0.49)	0.28 (0.07)	0.40 (0.08)	0.69 (0.16)	1.11
²⁴¹ Am (pCi g ⁻¹ ash)										
OS	0.037 (0.007)	0.018 (0.008)	0.103 (0.012)	0.114 (0.006)				0.012 (0.002)	0.013 (0.002)	
US	0.029 (0.004)	0.008 (0.004)	0.055 (0.008)	0.035 (0.003)	0.059 (0.006)	0.062 (0.007)	0.066 (0.007)	0.005 (0.002)	0.003 (0.001)	

¹#1=tritium shafts (south of the shafts just outside the fence), #2=tritium shafts (west of the shafts just outside the fence), #3=waste pits (east of the new pit inside the fence), #4=TRU waste pads (north of pads #3 and 4 just outside the fence), #5=TRU waste pad #3, #6=TRU waste pad #4, #7a=Pits #17 and 18 (southeastern portions) (not sampled in 1997), #7b=Pits (eastern end), #8=expansion area, and BG=background (south and upwind of LANL).

²Regional Statistical Reference Level; this is the upper (95%) level background concentration (mean + 2 std dev) from 1996-1997.

³tissue moisture.

⁴OS=overstory (trees) and US=understory (grasses/forbs).

⁵(± one counting uncertainty).

⁶Total U was calculated from U isotope activity.

Table 3. Radionuclide concentrations in unwashed vegetation collected from Area G in 1997.

Nuclide	#1 ¹	#2	#3	#4	#5	#6	#7b	#8	BG	RSRL ²
³ H (pCi mL ⁻¹) ³										
OS ⁴	72.0 (3.3) ⁵	207.0 (7.1)	0.86 (0.74)	1.13 (0.75)				0.19 (0.69)	0.04 (0.68)	1.87
US	19.2 (1.6)	77.5 (3.4)	0.76 (0.73)	1.12 (0.75)	664.0 (19.0)	1657.0 (46.0)	10.6 (1.2)	0.60 (0.72)	0.12 (0.69)	1.56
²³⁸ Pu (pCi g ⁻¹ ash)										
OS	0.002 (0.001)	0.004 (0.001)	0.130 (0.009)	0.018 (0.002)				0.000 (0.001)	0.001 (0.001)	0.038
US	0.002 (0.001)	0.002 (0.001)	0.005 (0.001)	0.092 (0.005)	0.051 (0.005)	0.017 (0.002)	0.011 (0.001)	0.001 (0.000)	0.003 (0.001)	0.005
²³⁹ Pu (pCi g ⁻¹ ash)										
OS	0.023 (0.002)	0.033 (0.003)	2.788 (0.105)	0.167 (0.007)				0.013 (0.002)	0.007 (0.001)	0.075
US	0.028 (0.002)	0.014 (0.002)	0.025 (0.002)	0.148 (0.007)	0.051 (0.005)	0.155 (0.008)	0.120 (0.005)	0.006 (0.001)	0.006 (0.001)	0.011
²³⁴ U (pCi g ⁻¹ ash)										
OS	0.298 (0.017)	0.316 (0.019)	1.169 (0.059)	0.346 (0.020)				0.213 (0.013)	0.128 (0.010)	0.441
US	0.179 (0.011)	0.217 (0.013)	0.251 (0.014)	0.269 (0.016)	0.329 (0.018)	0.417 (0.023)	0.221 (0.013)	0.138 (0.009)	0.147 (0.009)	0.407
²³⁵ U (pCi g ⁻¹ ash)										
OS	0.014 (0.002)	0.016 (0.003)	0.041 (0.005)	0.016 (0.003)				0.008 (0.002)	0.005 (0.002)	0.018
US	0.006 (0.001)	0.010 (0.002)	0.008 (0.002)	0.011 (0.002)	0.012 (0.002)	0.016 (0.003)	0.009 (0.002)	0.004 (0.001)	0.005 (0.001)	0.020

Table 3 (Cont.).

Nuclide	#1 ¹	#2	#3	#4	#5	#6	#7b	#8	BG	RSRL ²
²³⁸ U (pCi g ⁻¹ ash)										
OS	0.335 (0.018)	0.359 (0.021)	1.039 (0.053)	0.351 (0.020)				0.263 (0.015)	0.159 (0.012)	0.437
US	0.152 (0.009)	0.216 (0.013)	0.240 (0.013)	0.258 (0.015)	0.325 (0.018)	0.416 (0.023)	0.213 (0.013)	0.143 (0.009)	0.161 (0.009)	0.421
¹⁰⁶ U ⁴ (μg g ⁻¹ ash) ⁶										
OS	1.010 (0.055)	1.082 (0.064)	3.130 (0.161)	1.058 (0.061)				0.791 (0.046)	0.478 (0.037)	1.63
US	0.458 (0.027)	0.651 (0.040)	0.722 (0.040)	0.778 (0.046)	0.979 (0.055)	1.253 (0.070)	0.642 (0.040)	0.430 (0.027)	0.484 (0.027)	1.53
²²⁸ Ac (pCi g ⁻¹ ash)										
OS	2.01 (0.39)	2.71 (0.51)	3.13 (0.60)	2.68 (0.46)				1.73 (0.29)	2.67 (0.53)	2.90
US	1.19 (0.25)	1.97 (0.45)	2.32 (0.47)	1.75 (0.37)	3.53 (0.61)	2.94 (0.49)	2.60 (0.42)	1.28 (1.92)	1.98 (0.40)	4.07
²¹⁴ Pb (pCi g ⁻¹ ash)										
OS	1.24 (0.20)	1.63 (0.28)	1.47 (0.28)	1.32 (0.22)				0.89 (0.16)	0.97 (0.18)	2.35
US	0.92 (1.38)	0.70 (0.14)	1.43 (0.22)	1.13 (0.21)	1.29 (0.23)	1.33 (0.23)	1.12 (0.19)	1.01 (0.18)	1.09 (0.18)	1.83
⁶⁰ Co (pCi g ⁻¹ ash)										
OS	0.32 (0.47)	0.74 (0.13)	0.31 (0.46)	0.43 (0.65)				0.57 (0.14)	1.40 (0.24)	0.61
US	0.59 (0.89)	0.38 (0.57)	0.65 (0.18)	0.48 (0.72)	0.90 (0.19)	0.63 (0.12)	0.21 (0.32)	0.75 (0.17)	0.75 (0.17)	0.63

Table 3 (Cont.).

Nuclide	#1 ¹	#2	#3	#4	#5	#6	#7b	#8	BG	RSRL ²
¹³⁷ Cs (pCi g ⁻¹ ash)										
OS	0.29 (0.43)	0.18 (0.27)	0.39 (0.59)	0.06 (0.09)				0.24 (0.36)	0.34 (0.50)	1.65
US	0.33 (0.49)	0.23 (0.34)	0.28 (0.42)	0.11 (0.16)	-0.00 (1.80)	-0.03 (1.80)	0.11 (0.17)	-0.03 (1.80)	0.37 (0.08)	0.94
⁴⁰ K (pCi g ⁻¹ ash)										
OS	21.10 (11.22)	4.72 (10.38)	61.72 (15.61)	11.24 (10.68)				13.98 (10.90)	61.86 (14.99)	173.0
US	99.25 (24.30)	27.24 (19.30)	54.71 (21.09)	5.19 (18.17)	74.15 (22.93)	44.42 (20.71)	22.99 (18.68)	15.69 (18.40)	37.38 (19.75)	362.0
⁵⁴ Mn (pCi g ⁻¹ ash)										
OS	0.02 (0.00)	0.68 (0.12)	0.51 (0.00)	0.39 (0.10)				0.18 (0.00)	0.10 (0.00)	
US	0.53 (0.00)	0.08 (0.00)	0.46 (0.00)	0.11 (0.00)	0.64 (0.13)	0.52 (0.00)	0.23 (0.07)	0.34 (0.08)	0.49 (0.00)	
²² Na (pCi g ⁻¹ ash)										
OS	0.21 (0.31)	0.32 (0.09)	0.58 (0.14)	0.26 (0.07)				0.16 (0.24)	0.48 (0.73)	1.02
US	0.36 (0.12)	0.23 (0.34)	0.54 (0.81)	-0.04 (0.21)	0.47 (0.11)	0.15 (0.23)	0.23 (0.07)	0.36 (0.55)	0.60 (0.12)	0.57
²¹⁴ Pb (pCi g ⁻¹ ash)										
OS	0.99 (0.16)	1.16 (0.22)	2.23 (0.35)	1.07 (0.18)				1.14 (0.20)	0.98 (0.17)	2.69
US	0.99 (0.16)	0.84 (0.14)	1.06 (0.17)	1.12 (0.19)	1.60 (0.22)	1.93 (0.29)	0.42 (0.63)	0.97 (0.17)	0.94 (0.17)	2.68

Table 3 (Cont.).

Nuclide	#1 ¹	#2	#3	#4	#5	#6	#7b	#8	BG	RSRL ²
²⁰⁸ Tl (pCi g ⁻¹ ash)										
OS	0.86 (0.13)	0.75 (0.48)	1.36 (0.87)	0.50 (0.10)				0.42 (0.08)	0.46 (0.10)	1.02
US	0.75 (0.12)	0.69 (0.14)	0.72 (0.12)	0.79 (0.50)	0.94 (0.60)	1.16 (0.17)	0.66 (0.11)	0.35 (0.22)	0.52 (0.09)	0.59
²⁴¹ Am (pCi g ⁻¹ ash)										
OS	0.019 (0.002)	0.031 (0.003)	0.581 (0.031)	0.110 (0.006)				0.015 (0.003)	0.011 (0.002)	
US	0.007 (0.001)	0.015 (0.004)	0.015 (0.003)	0.063 (0.004)	0.090 (0.006)	0.157 (0.008)	0.108 (0.005)	0.008 (0.001)	0.002 (0.001)	

¹#1=tritium shafts (south of the shafts just outside the fence), #2=tritium shafts (west of the shafts just outside the fence), #3=waste pits (east of the new pit inside the fence), #4=TRU waste pads (north of pads #3 and 4 just outside the fence), #5=TRU waste pad #3, #6=TRU waste pad #4, #7a=Pits #17 and 18 (southeastern portions) (not sampled in 1997), #7b=Pits (eastern end), #8=expansion area, and BG=background (south and upwind of LANL).

²Regional Statistical Reference Level; this is the upper (95%) level background concentration (mean + 2 std dev) from 1995-1997.

³tissue moisture.

⁴OS=overstory (trees) and US=understory (grasses/forbs).

⁵(± one counting uncertainty).

⁶Total U was calculated from U isotope activity.

Table 4. Comparison of past and present ^3H and ^{239}Pu data in (unwashed) vegetation collected at similar sites within and around Area G.

Sites	^3H pCi mL ⁻¹	^{239}Pu pCi g ⁻¹ ash
#1 Tritium shafts (south of the shafts just outside fence)		
<u>Understory</u>		
Past ^a	1450.0	0.03
1994 ^b	201.0	0.02
1995 ^c	1400.0	0.01
1996	8279.0	0.01
1997	19.2	0.03
#2 Tritium shafts (west of the [high level] shafts just outside the fence)		
<u>Overstory</u>		
Past ^d	2200.0 to 4800.0	0.01
1994 ^b	5800.0	0.01
1995 ^c	418.0	0.00
1996	7569.0	0.00
1997	207.0	0.03
<u>Understory</u>		
Past ^a	0.4	0.27
1994 ^a	328.0	0.01
1995 ^b	4200.0	0.01
1996	4890.0	0.01
1997	77.5	0.01
#4 TRU waste pads (north of pad #2 and #4 just outside fence)		
<u>Overstory</u>		
Past ^a	14.4	0.57 to 3.28
1994 ^b	2.5	0.01
1995 ^c	4.3	0.06
1996	0.9	0.00
1997	1.1	0.17
<u>Understory</u>		
Past ^a	3860.0 to 19100.0	0.52 to 1.55
1994 ^b	35.6	0.15
1995 ^c	3.7	0.13
1996	0.8	0.15
1997	1.1	0.15
#5 TRU waste pads (pad #2)		
<u>Understory</u>		
Past ^c	392.0 to 101000.0	
1994 ^b	177.3	0.01
1995 ^c	7300.0	0.01
1996	3788.0	0.01
1997	664.0	0.05
#6 TRU waste pads (pad #4)		
<u>Understory</u>		
Past ^a	1028.0	0.95
1994 ^b	952.5	0.01
1995 ^c	2700.0	0.01
1996	14744.0	0.01
1997	1657.0	0.16

^aData from Mayfield and Hanson (1983), ^bData from Fresquez et al. (1995), ^cData from Fresquez et al. (1996b), ^dData in 1985 from Jacobson (1992), and ^eData from Purtymun (1973).

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APPENDIX A

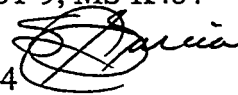
**CST ANALYTICAL REPORTS OF RADIONUCLIDES IN
SOIL SURFACE SAMPLES AT AREA G**

Los Alamos

NATIONAL LABORATORY

memorandum

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Symbol: CST-9-PRF-98-4
Date: June 18, 1998

SUBJECT: SUBMISSION 100020370 GAMMASCAN RESULTS IN SOIL

As per request, the GENERIC GAMMA results for submission id 100020370 have been reported and entered into the SQL*LIMS database. The Cs-137 results had been previously reported. The open QC's were *under control*. The Cs-137 open result was had a 2-3 SIGMA WARNING. There were no blind QC's submitted with this submission.

Should you have any questions concerning this submission, please feel free to call or send an e-mail message to me at....garcia_s@lanl.gov.

A-1

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method: **GENERIC GAMMA** Method Area: **EH-GAMMA** Submission Id: **100020370**

Requester Name: **PHIL FRESQUEZ** Customer Cost Code: **M34A02106CA3** Due Date: **20-AUG-97**
 Requester Group: **ESH-20** Logged Date: **20-JUN-1997** Screening Data: **NO SCREENING DATA REQUIRED**
 Mail Stop: **M887** Study: **ESH20 BIOLOGICALS** Logged by: **DDECKER**
 Requester Phone: **667-0815** Analytical Service Agreement #:
 Requester Fax #: **667-0731**

CUSTOMER SAMPLES

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200030282	300157646	1	CS-137	0.39	0.04	pCi/g	
			AM-241	0.31	0.47	pCi/g	
			AC-228	1.82	0.20	pCi/g	
			BE-7	27.18	5.77	pCi/g	
			BI-214	1.46	0.14	pCi/g	
			CO-57	0.02	0.03	pCi/g	
			CO-60	-0.04	0.05	pCi/g	
			K-40	24.20	2.08	pCi/g	
			MN-54	0.15	0.03	pCi/g	
			NA-22	0.05	0.01	pCi/g	
			PB-212	1.69	0.16	pCi/g	
			PB-214	1.28	0.12	pCi/g	
			TL-208	0.53	0.06	pCi/g	
			CS-137	0.36	0.05	pCi/g	
			AM-241	-0.06	0.24	pCi/g	
			AC-228	1.76	0.20	pCi/g	
			BE-7	14.00	21.00	pCi/g	
			BI-214	1.49	0.15	pCi/g	
200030283	300157643	2					

**** FINAL REPORT ****

A-2

Submission Id : 100020370

Method Area: EH-GAMMA

Method: GENERIC GAMMA

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualified
200030283	300157643	2	CO-57	0.09	0.14	pCi/g	
			CO-60	0.08	0.02	pCi/g	
			K-40	25.46	2.18	pCi/g	
			MN-54	0.15	0.03	pCi/g	
			NA-22	0.12	0.18	pCi/g	
			PB-212	1.93	0.17	pCi/g	
			PB-214	1.40	0.14	pCi/g	
			TL-208	0.70	0.07	pCi/g	
			CS-137	0.63	0.07	pCi/g	
			AM-241	1.33	0.25	pCi/g	
200030284	300157644	3	AC-228	1.76	0.19	pCi/g	
			BE-7	25.95	5.39	pCi/g	
			BI-214	1.39	0.14	pCi/g	
			CO-57	0.06	0.09	pCi/g	
			CO-60	-0.05	0.05	pCi/g	
			K-40	22.99	1.99	pCi/g	
			MN-54	0.12	0.02	pCi/g	
			NA-22	0.05	0.07	pCi/g	
			PB-212	1.59	0.15	pCi/g	
			PB-214	1.28	0.12	pCi/g	
200030285	300157645	4	TL-208	0.60	0.06	pCi/g	
			CS-137	0.50	0.05	pCi/g	
			AM-241	0.06	0.09	pCi/g	
			AC-228	1.54	0.18	pCi/g	
			BE-7	37.87	6.66	pCi/g	
			BI-214	1.37	0.14	pCi/g	
			CO-57	-0.01	0.75	pCi/g	
			CO-60	-0.04	0.05	pCi/g	
			K-40	23.45	2.02	pCi/g	
			MN-54	0.09	0.02	pCi/g	
NA-22	0.02	0.02	pCi/g				

FINAL REPORT

Method: GENERIC GAMMA Method Area: EH-GAMMA Submission Id: 100020370

Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
200030285	300157645	4	PB-212	1.68	0.15	pCi/g	
			PB-214	1.23	0.12	pCi/g	
			TL-208	0.64	0.07	pCi/g	
			CS-137	-0.01	0.08	pCi/g	
			AM-241	-0.02	0.24	pCi/g	
			AC-228	2.04	0.22	pCi/g	
			BE-7	24.00	36.00	pCi/g	
			BI-214	1.57	0.16	pCi/g	
			CO-57	0.08	0.12	pCi/g	
			CO-60	-0.04	0.05	pCi/g	
200030286	300157650	5	K-40	31.19	2.61	pCi/g	
			MN-54	0.17	0.03	pCi/g	
			NA-22	0.01	0.02	pCi/g	
			PB-212	1.96	0.18	pCi/g	
			PB-214	1.52	0.15	pCi/g	
			TL-208	0.69	0.07	pCi/g	
			CS-137	0.02	0.02	pCi/g	
			AM-241	0.79	0.24	pCi/g	
			AC-228	1.74	0.20	pCi/g	
			BE-7	31.00	46.50	pCi/g	
200030287	300157651	6	BI-214	1.53	0.15	pCi/g	
			CO-57	0.00	0.75	pCi/g	
			CO-60	-0.05	0.05	pCi/g	
			K-40	30.18	2.54	pCi/g	
			MN-54	0.08	0.02	pCi/g	
			NA-22	0.07	0.02	pCi/g	
			PB-212	1.98	0.18	pCi/g	
			PB-214	1.47	0.14	pCi/g	
			TL-208	0.67	0.07	pCi/g	
			CS-137	0.09	0.02	pCi/g	
200030288	300157647	7	AM-241	1.28	0.21	pCi/g	

**** FINAL REPORT ****

Method: GENERIC GAMMA

Method Area: EH-GAMMA

Submission Id : 100020370

<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200030288	300157647	7	AC-228	1.39	0.16	pCi/g	
			BE-7	27.00	40.50	pCi/g	
			BI-214	1.33	0.13	pCi/g	
			CO-57	-0.02	0.75	pCi/g	
			CO-60	-0.05	0.05	pCi/g	
			K-40	20.12	1.78	pCi/g	
			MN-54	0.10	0.02	pCi/g	
			NA-22	-0.01	0.05	pCi/g	
			PB-212	1.51	0.14	pCi/g	
			PB-214	1.16	0.11	pCi/g	
			TL-208	0.54	0.06	pCi/g	
			CS-137	0.43	0.05	pCi/g	
			AM-241	1.07	0.20	pCi/g	
200030289	300157648	8	AC-228	1.53	0.18	pCi/g	
			BE-7	39.00	58.50	pCi/g	
			BI-214	1.47	0.15	pCi/g	
			CO-57	0.11	0.16	pCi/g	
			CO-60	-0.02	0.05	pCi/g	
			K-40	21.58	1.89	pCi/g	
			MN-54	0.19	0.03	pCi/g	
			NA-22	0.09	0.02	pCi/g	
			PB-212	1.65	0.16	pCi/g	
			PB-214	1.44	0.13	pCi/g	
			TL-208	0.55	0.06	pCi/g	
			CS-137	0.56	0.06	pCi/g	
			AM-241	0.15	0.23	pCi/g	
200030290	300157649	9	AC-228	1.56	0.18	pCi/g	
			BE-7	25.57	5.66	pCi/g	
			BI-214	1.41	0.14	pCi/g	
			CO-57	0.02	0.03	pCi/g	
			CO-60	-0.02	0.05	pCi/g	

**** FINAL REPORT ****

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Method: **GENERIC GAMMA** Method Area: **EH-GAMMA** Submission Id: **100020370**

<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200030290	300157649	9	K-40	18.42	1.65	pCi/g	
			MN-54	0.11	0.03	pCi/g	
			NA-22	0.02	0.01	pCi/g	
			PB-212	1.57	0.15	pCi/g	
			PB-214	1.51	0.14	pCi/g	
			TL-208	0.60	0.06	pCi/g	

DUPLICATE TASKS

<u>Sample Id</u>	<u>Task Id</u>	<u>Original Task</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200030282	300157646		CS-137	0.39	0.04	pCi/g	
			AM-241	0.31	0.47	pCi/g	
			AC-228	1.82	0.20	pCi/g	
			BE-7	27.18	5.77	pCi/g	
			BI-214	1.46	0.14	pCi/g	
			CO-57	0.02	0.03	pCi/g	
			CO-60	-0.04	0.05	pCi/g	
			K-40	24.20	2.08	pCi/g	
			MN-54	0.15	0.03	pCi/g	
			NA-22	0.05	0.01	pCi/g	
			PB-212	1.69	0.16	pCi/g	
			PB-214	1.28	0.12	pCi/g	
			TL-208	0.53	0.06	pCi/g	
		300157646	CS-137	0.37	0.05	pCi/g	
			AM-241	0.68	0.18	pCi/g	
			AC-228	1.70	0.19	pCi/g	
			BE-7	0.02	0.03	pCi/g	
			BI-214	1.39	0.14	pCi/g	
			CO-57	0.03	0.04	pCi/g	
200064149	300157659						

**** FINAL REPORT ****

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20-Jul-1998 11:00

Method: GENERIC GAMMA Method Area: EH-GAMMA Submission Id: 100020370

<u>Sample Id</u>	<u>Task Id</u>	<u>Original Task</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
200064149	300157659	300157646	CO-60	-0.05	0.05	pCi/g	
			K-40	27.81	2.36	pCi/g	
			MN-54	0.04	0.01	pCi/g	
			NA-22	0.11	0.16	pCi/g	
			PB-212	1.83	0.17	pCi/g	
			PB-214	1.40	0.13	pCi/g	
			TL-208	0.66	0.07	pCi/g	

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**** FINAL REPORT ****

Method: GENERIC GAMMA

Method Area: EH-GAMMA

Submission Id: 100020370

***** CST QUALITY ASSURANCE REPORT *****

OPEN QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
00.32385	300157658	AM-241	18.07	1.46	pCi/g	16.8	1.7	pCi/g	IN CONTROL
		CS-137	7.52	0.57	pCi/g	5.6	0.3	pCi/g	WARNING 2-3SIG

METHOD BLANK

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	QC Value	QC Uncertainty	QC units	QC Evaluation
00.22776	300157657	CS-137	-0.00	0.08	pCi/g	0.0	0.0	pCi/g	IN CONTROL

***** FINAL REPORT *****

20-Jul-1998 11:00

Method: GENERIC GAMMA

Method Area: EH-GAMMA

Submission Id: 100020370

[Signature]
Analyst

[Signature]
Review

[Signature]
Team Leader

NK
QA Officer

7/20/98
Date

7/20/98
Date

7/20/98
Date

07/21/98
Date

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The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level unless otherwise stated."

**** FINAL REPORT ****

Los Alamos
NATIONAL LABORATORY
memorandum
Chemical Science and Technology
Responsible Chemistry for America
CST-9/Inorganic Trace Analysis
Los Alamos, New Mexico 87545

To/MS: Phil Fresquez/M887
From/MS: Edward R. Gonzales/K484, CST-9
Phone/FAX: 7-9059/5-5982
Symbol: CST-9/94
Date: 03-12-98

Case Narration

Submission ID: 100023070
Analysis: Iso-U

Narration

Method blank 00.22776 is listed as having a 1% chemical recovery. On evaluation of prep data it was found that the sample was not traced at onset of analyses. I verify that the listed data is complete and technically correct and the untraced method blank does not reflect on the quality of the remaining data.

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Submission Id : 100020370

Method Area: EH-ALPHA

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	M34A02106CA3	Due Date:	20-AUG-97
Requester Group:	ESH-20	Logged Date:	20-JUN-97	Screening Data:	NO SCREENING DATA REQUIRED
Mail Stop:	M887	Study:	ESH20 BIOLOGICALS	Logged by:	DDECKER
Requester Phone:	667-0815				
Requester Fax #:	667-0731	Analytical Service Agreement #:			

CUSTOMER SAMPLES

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
U RAS ENV	200030282	300093744	1	U-234	0.8230	0.0350	pCi/g	
			1	U-235	0.0304	0.0052	pCi/g	
			1	U-238	0.8795	0.0367	pCi/g	
			1	U-234 Gross Counts	983		counts	
			1	U-234 Background Counts	4.4		counts	
			1	U-235 Gross Counts	37		counts	
			1	U-235 Background Counts	0.8		counts	
			1	U-238 Gross Counts	1048		counts	
			1	U-238 Background Counts	2.2		counts	
			1	U-232T Spike	3.11		pCi	
			1	U-232T Recovery	87.99		%	
			1	Efficiency	22.83		%	
			1	Count Time	1333.33		min	
			1	Analysis Date	2/23/98		MM/DD/YY	
			1	Instrument	ALPHA 112		NONE	
	200030283	300093750	2	U-234	0.9171	0.0386	pCi/g	
			2	U-235	0.0311	0.0055	pCi/g	
			2	U-238	0.9649	0.0400	pCi/g	
			2	U-234 Gross Counts	1048		counts	

***** FINAL REPORT *****

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Method Area: EH-ALPHA

Submission Id : 100020370

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
U RAS ENV	200030283	300093750	2	U-234 Background Counts	5.0		counts	
			2	U-235 Gross Counts	38		counts	
			2	U-235 Background Counts	2.6		counts	
			2	U-238 Gross Counts	1099		counts	
			2	U-238 Background Counts	1.6		counts	
			2	U-232T Spike	3.11		pCi	
			2	U-232T Recovery	85.67		%	
			2	Efficiency	22.43		%	
			2	Count Time	1333.33		min	
			2	Analysis Date	2/23/98		MM/DD/YY	
			2	Instrument	ALPHA 112		NONE	
			3	U-234	0.9599	0.0406	pCi/g	
			3	U-235	0.0326	0.0057	pCi/g	
			3	U-238	1.1219	0.0456	pCi/g	
			3	U-234 Gross Counts	1050		counts	
			3	U-234 Background Counts	2.6		counts	
			3	U-235 Gross Counts	37		counts	
	200030284	300093756	3	U-235 Background Counts	1.4		counts	
			3	U-238 Gross Counts	1227		counts	
			3	U-238 Background Counts	2.8		counts	
			3	U-232T Spike	3.11		pCi	
			3	U-232T Recovery	75.79		%	
			3	Efficiency	24.32		%	
			3	Count Time	1333.33		min	
			3	Analysis Date	2/23/98		MM/DD/YY	
			3	Instrument	ALPHA 112		NONE	
			4	U-234	0.8968	0.0396	pCi/g	

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Method Area: EH-ALPHA

Submission Id : 100020370

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
U RAS ENV	200030285	300093762	4	U-235	0.0512	0.0073	pCi/g	
			4	U-238	0.9474	0.0412	pCi/g	
			4	U-234 Gross Counts	932		counts	
			4	U-234 Background Counts	3.8		counts	
			4	U-235 Gross Counts	54		counts	
			4	U-235 Background Counts	1.0		counts	
			4	U-238 Gross Counts	982		counts	
			4	U-238 Background Counts	1.4		counts	
			4	U-232T Spike	3.11		pCi	
			4	U-232T Recovery	72.62		%	
	200030286	300093768	4	Efficiency	24.08		%	
			4	Count Time	1333.33		min	
			4	Analysis Date	2/23/98		MM/DD/YY	
			4	Instrument	ALPHA 112		NONE	
			5	U-234	1.0202	0.0436	pCi/g	
			5	U-235	0.0450	0.0069	pCi/g	
			5	U-238	0.9841	0.0424	pCi/g	
			5	U-234 Gross Counts	1057		counts	
			5	U-234 Background Counts	5.2		counts	
			5	U-235 Gross Counts	48		counts	
			5	U-235 Background Counts	1.6		counts	
			5	U-238 Gross Counts	1017		counts	
			5	U-238 Background Counts	2.4		counts	
			5	U-232T Spike	3.11		pCi	
			5	U-232T Recovery	77.23		%	
			5	Efficiency	22.55		%	
			5	Count Time	1333.33		min	

**** FINAL REPORT ****

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Method Area: EH-ALPHA

Submission Id : 100020370

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
U RAS ENV	200030286	300093768	5	Analysis Date	2/23/98		MM/DD/YY	
			5	Instrument	ALPHA 112		NONE	
	200030287	300093774	6	U-234	0.8875	0.0409	pCi/g	
			6	U-235	0.0370	0.0066	pCi/g	
			6	U-238	0.9447	0.0427	pCi/g	
			6	U-234 Gross Counts	847		counts	
			6	U-234 Background Counts	6.6		counts	
			6	U-235 Gross Counts	37		counts	
			6	U-235 Background Counts	2.0		counts	
			6	U-238 Gross Counts	897		counts	
			6	U-238 Background Counts	2.4		counts	
			6	U-232T Spike	3.11		pCi	
			6	U-232T Recovery	71.26		%	
			6	Efficiency	22.45		%	
			6	Count Time	1333.33		min	
	200030288	300093780	6	Analysis Date	2/23/98		MM/DD/YY	
			6	Instrument	ALPHA 112		NONE	
			7	U-234	0.8696	0.0424	pCi/g	
			7	U-235	0.0337	0.0066	pCi/g	
			7	U-238	0.9638	0.0456	pCi/g	
			7	U-234 Gross Counts	746		counts	
			7	U-234 Background Counts	7.4		counts	
			7	U-235 Gross Counts	30		counts	
			7	U-235 Background Counts	1.4		counts	
			7	U-238 Gross Counts	821		counts	
			7	U-238 Background Counts	2.4		counts	
			7	U-232T Spike	3.11		pCi	

**** FINAL REPORT ****

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Submission Id : 100020370

Method Area: EH-ALPHA

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
URAS ENV	200030288	300093780	7	U-232T Recovery	60.36		%	
			7	Efficiency	23.77		%	
			7	Count Time	1333.33		min	
	200030289	300093786	7	Analysis Date	2/23/98		MM/DD/YY	
			7	Instrument	ALPHA 112		NONE	
			8	U-234	0.8649	0.0436	pCi/g	
			8	U-235	0.0159	0.0049	pCi/g	
			8	U-238	0.9486	0.0464	pCi/g	
			8	U-234 Gross Counts	695		counts	
			8	U-234 Background Counts	8.4		counts	
			8	U-235 Gross Counts	15		counts	
			8	U-235 Background Counts	2.4		counts	
			8	U-238 Gross Counts	755		counts	
			8	U-238 Background Counts	2.0		counts	
			8	U-232T Spike	3.11		pCi	
			8	U-232T Recovery	58.43		%	
			8	Efficiency	22.95		%	
			8	Count Time	1333.33		min	
			8	Analysis Date	2/23/98		MM/DD/YY	
	200030290	300093792	8	Instrument	ALPHA 112		NONE	
			9	U-234	0.8116	0.0401	pCi/g	
			9	U-235	0.0190	0.0051	pCi/g	
			9	U-238	0.9499	0.0448	pCi/g	
			9	U-234 Gross Counts	705		counts	
			9	U-234 Background Counts	5.8		counts	
			9	U-235 Gross Counts	19		counts	
			9	U-235 Background Counts	2.6		counts	

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Method Area: EH-ALPHA

Submission Id : 100020370

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
U RAS ENV	200030290	300093792	9	U-238 Gross Counts	821		counts	
			9	U-238 Background Counts	2.6		counts	
			9	U-232T Spike	3.11		pCi	
			9	U-232T Recovery	66.02		%	
			9	Efficiency	22.04		%	
			9	Count Time	1333.33		min	
			9	Analysis Date	2/23/98		MM/DD/YY	
			9	Instrument	ALPHA 112		NONE	

DUPLICATE TASKS

<u>Method</u>	<u>Sample Type</u>	<u>Task Id</u>	<u>Original Task</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
U RAS ENV	Duplicate	300139107	300093744	U-234	0.9378	0.0385	pCi/g	
			300093744	U-235	0.0323	0.0054	pCi/g	
			300093744	U-238	0.9521	0.0389	pCi/g	
			300093744	U-234 Gross Counts	1119		counts	
			300093744	U-234 Background Counts	4.6		counts	
			300093744	U-235 Gross Counts	40		counts	
			300093744	U-235 Background Counts	1.6		counts	
			300093744	U-238 Gross Counts	1133		counts	
			300093744	U-238 Background Counts	1.6		counts	
			300093744	U-232T Spike	3.11		pCi	
			300093744	U-232T Recovery	87.01		%	
			300093744	Efficiency	23.07		%	
			300093744	Count Time	1333.33		min	

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Method Area: EH-ALPHA

Submission Id : 100020370

<u>Method</u>	<u>Sample Type</u>	<u>Task Id</u>	<u>Original Task</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
U RASENV	Duplicate	300139107	300093744 300093744	Analysis Date Instrument	2/23/98 ALPHA 112		MM/DD/YY NONE	

SAMPLE SPIKES

None run for this submission

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**** FINAL REPORT ****

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Method Area: EH-ALPHA

Submission Id : 100020370

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

None run for this submission

METHOD BLANKS

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	Qualifier	QC Value	QC Uncertainty	QC units	QC Evaluation
00.22776	300139114	U-234	0.1415	2.2601	pCi/g		0.0	0.0	pCi/g	UNDER CONTROL
00.22776		U-235	0.0000	0.8247	pCi/g		0.0	0.0	pCi/g	UNDER CONTROL
00.22776		U-238	0.0000	1.1095	pCi/g		0.0	0.0	pCi/g	UNDER CONTROL

OPEN QC

None run for this submission

A-18

**** FINAL REPORT ****

18 ay 44.

Method Area: EH-ALPHA

Submission Id : 100020370

[Signature]
Analyst

[Signature]
Review

[Signature]
Team Leader

NK
QA Officer

3/4/98
Date

3/6/98
Date

3/12/98
Date

3/12/98
Date

A-19

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level."

**** FINAL REPORT ****

19 of 44

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Submission Id : 100020370

Method Area: EH-ALPHA

Requester Name: PHIL FRESQUEZ Customer Cost Code: M34A02106CA3 Due Date: 20-AUG-97
 Requester Group: ESH-20 Logged Date: 20-JUN-97 Screening Data: NO SCREENING DATA REQUIRED

Mail Stop: M887 Study: ESH20 BIOLOGICALS Logged by: DDECKER
 Requester Phone: 667-0815
 Requester Fax #: 667-0731 Analytical Service Agreement #:

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC RAS	200030282	300093743	1	Pu-238	0.0047	0.0011	pCi/g	
			1	Pu-239	0.0246	0.0022	pCi/g	
			1	Pu-242T Spike	8.27		pCi	
			1	Pu-242T Recovery	86.49		%	
			1	Pu-242T Recovered	7.15		pCi	
	200030283	300093749	2	Pu-238	0.0041	0.0010	pCi/g	
			2	Pu-239	0.0235	0.0023	pCi/g	
			2	Pu-242T Spike	8.27		pCi	
			2	Pu-242T Recovery	80.34		%	
			2	Pu-242T Recovered	6.64		pCi	
	200030284	300093755	3	Pu-238	0.0185	0.0020	pCi/g	
			3	Pu-239	0.0519	0.0034	pCi/g	
			3	Pu-242T Spike	8.27		pCi	
			3	Pu-242T Recovery	81.33		%	
			3	Pu-242T Recovered	6.73		pCi	
	200030285	300093761	4	Pu-238	0.2464	0.0084	pCi/g	
			4	Pu-239	0.4599	0.0128	pCi/g	
			4	Pu-242T Spike	8.27		pCi	
			4	Pu-242T Recovery	86.84		%	
			4	Pu-242T Recovered	7.18		pCi	
	200030286	300093767	5	Pu-238	0.0071	0.0013	pCi/g	
			5	Pu-239	0.0256	0.0024	pCi/g	
			5	Pu-242T Spike	8.27		pCi	

**** FINAL REPORT ****

000000

Method Area:

EH-ALPHA

Submission Id : 100020370

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
GENERIC RAS	200030286	300093767	5	Pu-242T Recovery	79.34		%	
			5	Pu-242T Recovered	6.56		pCi	
	200030287	300093773	6	Pu-238	0.1350	0.0060	pCi/g	
			6	Pu-239	0.2941	0.0097	pCi/g	
			6	Pu-242T Spike	8.27		pCi	
			6	Pu-242T Recovery	77.37		%	
			6	Pu-242T Recovered	6.4		pCi	
	200030288	300093779	7	Pu-238	0.0044	0.0010	pCi/g	
			7	Pu-239	0.0168	0.0019	pCi/g	
			7	Pu-242T Spike	8.27		pCi	
			7	Pu-242T Recovery	88.53		%	
			7	Pu-242T Recovered	7.32		pCi	
	200030289	300093785	8	Pu-238	0.0080	0.0013	pCi/g	
			8	Pu-239	0.3566	0.0103	pCi/g	
			8	Pu-242T Spike	8.27		pCi	
			8	Pu-242T Recovery	88.32		%	
	200030290	300093791	8	Pu-242T Recovered	7.3		pCi	
			9	Pu-238	0.0014	0.0005	pCi/g	
			9	Pu-239	0.0177	0.0019	pCi/g	
			9	Pu-242T Spike	8.27		pCi	
			9	Pu-242T Recovery	82.83		%	
			9	Pu-242T Recovered	6.85		pCi	

A-21

DUPLICATE TASKS

None run for this submission

30282 Pu 238 .0063 * .0012 pCi/g 88%

30282 Pu 239 .0286 * .0024 pCi/g 88%

000000

**** FINAL REPORT ****

Method Area: EH-ALPHA

Submission Id : 100020370

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units pCi/g	Qualifier	QC		QC units pCi/g	QC Evaluation UNDER CONTROL UNDER CONTROL
							Value	Uncertainty		
00.36507	300111030	Pu-238	0.4202	0.0131	pCi/g		.39	.013		
		Pu-239	0.7828	0.0207	pCi/g		.77	.024		

METHOD BLANKS

None run for this submission

OPEN QC

None run for this submission

22776 Pu-238 .000 ± .001 pCi/g 77%

22776 Pu-239 .002 ± .001 pCi/g 77%

**** FINAL REPORT ****

000000

Method Area: EH-ALPHA

Submission Id : 100020370

RJP
Analyst

SR
Review

CB
Team Leader

maq
QA Officer

28 Oct 97
Date

11/05/97
Date

11/06/97
Date

11-6-97
Date

A-23

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level."

**** FINAL REPORT ****

000009

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method Area: **EH-ALPHA**Submission Id : **100020370**

Requester Name: PHIL FRESQUEZ	Customer Cost Code: M34A02106CA3	Due Date: 20-AUG-97
Requester Group: ESH-20	Logged Date: 20-JUN-97	Screening Data: NO SCREENING DATA REQUIRED
Mail Stop: M887	Study: ESH20 BIOLOGICALS	
Requester Phone: 667-0815	Logged by: DDECKER	
Requester Fax #: 667-0731	Analytical Service Agreement #:	

CUSTOMER SAMPLES

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
AM RAS ENV	200030282	300093745	1	Am-241	0.0065	0.0014	pCi/g	
			1	Am-243T Spike	6.08		pCi	
			1	Am-243T Recovery	68.57		%	
			1	Am-243T Recovered	4.17		pCi	
	200030283	300093751	2	Am-241	0.008	0.004	pCi/g	
			2	Am-243T Spike	6.08		pCi	
			2	Am-243T Recovery	60.63		%	
			2	Am-243T Recovered	3.69		pCi	
	200030284	300093757	3	Am-241	0.015	0.006	pCi/g	
			3	Am-243T Spike	6.08		pCi	
			3	Am-243T Recovery	44.23		%	
			3	Am-243T Recovered	2.69		pCi	
	200030285	300093763	4	Am-241	0.1133	0.0065	pCi/g	
			4	Am-243T Spike	6.08		pCi	
			4	Am-243T Recovery	56.31		%	
			4	Am-243T Recovered	3.42		pCi	
	200030286	300093769	5	Am-241	0.0134	0.0022	pCi/g	
			5	Am-243T Spike	6.08		pCi	
			5	Am-243T Recovery	57.91		%	
			5	Am-243T Recovered				

**** FINAL REPORT ****

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Method Area: EH-ALPHA

Submission Id : 100020370

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
AM RAS ENV	200030286	300093769	5	Am-243T Recovered	3.52		pCi	
	200030287	300093775	6	Am-241	0.0072	0.0016	pCi/g	
			6	Am-243T Spike	6.08		pCi	
			6	Am-243T Recovery	57.56		%	
			6	Am-243T Recovered	3.5		pCi	
	200030288	300093781	7	Am-241	0.0111	0.0016	pCi/g	
			7	Am-243T Spike	6.08		pCi	
			7	Am-243T Recovery	74.81		%	
			7	Am-243T Recovered	4.55		pCi	
	200030289	300093787	8	Am-241	0.007	0.003	pCi/g	
			8	Am-243T Spike	6.08		pCi	
			8	Am-243T Recovery	61.92		%	
			8	Am-243T Recovered	3.76		pCi	
	200030290	300093793	9	Am-241	0.007	0.003	pCi/g	
			9	Am-243T Spike	6.08		pCi	
			9	Am-243T Recovery	51.86		%	
			9	Am-243T Recovered	3.15		pCi	

DUPLICATE TASKS

<u>Method</u>	<u>Sample Type</u>	<u>Task Id</u>	<u>Original Task</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
AM RAS ENV	Duplicate	300131121	300093745	Am-241	0.0137	0.0021	pCi/g	
	30282		300093745	Am-243T Spike	6.08		pCi	
			300093745	Am-243T Recovery	58.95		%	
			300093745	Am-243T Recovered	3.58		pCi	

**** FINAL REPORT ****

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A-25

Method Area: EH-ALPHA

Submission Id : 100020370

<u>Method</u>	<u>Sample Type</u>	<u>Task Id</u>	<u>Original Task</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
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SAMPLE SPIKES

None run for this submission

A 26

**** FINAL REPORT ****

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Method Area: EH-ALPHA

Submission Id : 100020370

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	Qualifier	QC Value	QC Uncertainty	QC units	QC Evaluation
00.36507	300111029	Am-241	1.04	0.05	pCi/g		.92	.041	pCi/g	UNDER CONTROL

METHOD BLANKS

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	Qualifier	QC Value	QC Uncertainty	QC units	QC Evaluation
00.22776	300131122	Am-241	0.0041	0.0011	pCi/g		0.0	0.0	pCi/g	OUT OF CONTROL

OPEN QC

None run for this submission

Task blank is ok.

LJP

***** FINAL REPORT *****

000000

A-27

Method Area: EH-ALPHA

Submission Id : 100020370

RJP
Analyst

SDG
Review

SB for GB
Team Leader

mae
QA Officer

12 JAN 98
Date

1/13/98
Date

1/13/98
Date

1/13/98
Date

A-28

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level."

**** FINAL REPORT ****

000000

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method Area: EH-ALPHA

Submission Id : 100020370

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	M34A02106CA3	Due Date:	20-AUG-97
Requester Group:	ESH-20	Logged Date:	20-JUN-97	Screening Data:	NO SCREENING DATA REQUIRED
Mall Stop:	M887	Study:	ESH20 BIOLOGICALS	Logged by:	DDECKER
Requester Phone:	667-0815	Analytical Service Agreement #:			
Requester Fax #:	667-0731				

CUSTOMER SAMPLES

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC LS	200030282	300093741	1	H-3	36902.00	1140.00	pCi/L	
			1	H-3 DL	750.00		pCi/L	
	200030283	300093747	2	H-3	49787.00	1485.00	pCi/L	
			2	H-3 DL	750.00		pCi/L	
	200030284	300093753	3	H-3	515.00	206.00	pCi/L	
			3	H-3 DL	750.00		pCi/L	
	200030285	300093759	4	H-3	1068.00	231.00	pCi/L	
			4	H-3 DL	750.00		pCi/L	
	200030286	300093765	5	H-3	12806.00	510.00	pCi/L	
			5	H-3 DL	750.00		pCi/L	
	200030287	300093771	6	H-3	11371.00	474.00	pCi/L	
			6	H-3 DL	750.00		pCi/L	
	200030288	300093777	7	H-3	1782.00	240.00	pCi/L	
			7	H-3 DL	750.00		pCi/L	
	200030289	300093783	8	H-3	-132.00	375.00	pCi/L	
			8	H-3 DL	750.00		pCi/L	
	200030290	300093789	9	H-3	-447.00	228.00	pCi/L	
			9	H-3 DL	750.00		pCi/L	

9000000

A-29

**** FINAL REPORT ****

Submission Id : 100020370

Method Area: EH-ALPHA

DUPLICATE TASKS

<u>Method</u>	<u>Sample Type</u>	<u>Task Id</u>	<u>Original Task</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
GENERIC LS	Duplicate	300121640	300093753	H-3	1040.00	223.00	pCi/L	
			300093753	H-3 DL	750.00		pCi/L	

SAMPLE SPIKES

None run for this submission

A-30

7000000

**** FINAL REPORT ****

Method Area: EH-ALPHA

Submission Id : 100020370

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units pCi/L	Qualifier	QC Value	QC Uncertainty	QC units pCi/L	QC Evaluation
00.36412	300105960	H-3	1803.00	246.00	pCi/L		2500	65		WARNING 2-3SIG

METHOD BLANKS

None run for this submission

OPEN QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units uCi/L	Qualifier	QC Value	QC Uncertainty	QC units uCi/L	QC Evaluation
00.35619	300121641	H-3	0	0	uCi/L		0	0		UNDER CONTROL
00.35623	300121642	H-3	0.012	0.0010	uCi/L		0.013660	0.001366		UNDER CONTROL

A-31

8000000

**** FINAL REPORT ****

600000

Submission Id : 100020370

Method Area: EH-ALPHA

Cipe
Analyst

Evg
Review

CS
Team Leader

mag
QA Officer

2/4/98
Date

2-4-98
Date

2/4/98
Date

2/5/98
Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level."

**** FINAL REPORT ****

A-32

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method Area: EH-GAMMA

Submission Id: 100020370

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	M34A02106CA3	Due Date:	20-AUG-97
Requester Group:	ESH-20	Logged Date:	20-JUN-97	Screening Data:	NO SCREENING DATA REQUIRED
Mail Stop:	M887	Study:	ESH20 BIOLOGICALS	Logged by:	DDECKER
Requester Phone:	667-0815	Analytical Service Agreement #:			
Requester Fax #:	667-0731				

CUSTOMER SAMPLES

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC GAMMA	200030282	300093740	1	CS-137	0.41	0.04	pCi/g	
	200030283	300093746	2	CS-137	0.40	0.04	pCi/g	
	200030284	300093752	3	CS-137	0.62	0.06	pCi/g	
	200030285	300093758	4	CS-137	0.50	0.05	pCi/g	
	200030286	300093764	5	CS-137	0.11	0.02	pCi/g	
	200030287	300093770	6	CS-137	0.15	0.23	pCi/g	
	200030288	300093776	7	CS-137	0.17	0.02	pCi/g	
	200030289	300093782	8	CS-137	0.40	0.04	pCi/g	
	200030290	300093788	9	CS-137	0.58	0.05	pCi/g	

DUPLICATE TASKS

Method	Sample Type	Task Id	Original Task	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC GAMMA	Duplicate	300143677	300093740	CS-137	0.40	0.04	pCi/g	

**** FINAL REPORT ****

31-Mar-1998 14:00

Page 2 of 4

Method Area: EH-GAMMA

Submission Id: 100020370

SAMPLE SPIKES

None run for this submission

A-34

**** FINAL REPORT ****

Method Area: EH-GAMMA

Submission Id: 100020370

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

None run for this submission

METHOD BLANKS

Customer Id	Task Id	Component	Result Value	Uncertainty	Units pCi/g	Qualifier	QC Value	QC Uncertainty	QC units pCi/g	QC Evaluation UNDER CONTROL
00.22776	300143675	CS-137	-0.00	0.08			0.0	0.0		

OPEN QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units pCi/g	Qualifier	QC Value	QC Uncertainty	QC units pCi/g	QC Evaluation UNDER CONTROL
00.32385	300143676	AM-241	18.2	1.3	pCi/g		16.8	1.7		
00.32385		CS-137	6.34	0.42	pCi/g		5.6	0.3		

***** FINAL REPORT *****

A-35

Method Area: EH-GAMMA

Submission Id: 100020370

[Signature]
Analyst

[Signature]
Review

[Signature]
Team Leader

NK
QA Officer

3/31/98
Date

3/31/98
Date

4/1/98
Date

04/01/98
Date

A-36

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level."

**** FINAL REPORT ****

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

**SAMPLE MANAGEMENT
RECEIVING RECORD**

CUSTOMER INFORMATION

M34A
0210 6A3
Cost Account:

Name <i>Phil FRESQUE</i>	Group <i>ESH-20</i>	Phone <i>7-0815</i>	Mail Stop <i>M887</i>	Program Code <i>1000</i> <i>WEL-6-1000</i>
--------------------------	---------------------	---------------------	-----------------------	---

PROJECT DESCRIPTION

1	6/16/97	6	6/17/97
2	6/16/97	7	6/17/97
3	6/17/97	8	6/17/97
4	6/17/97	9	6/17/97
5	6/17/97		

SAMPLE RECEIVING INFORMATION

Received By <i>Diana L. Decker</i>	Date Received <i>6/19/97</i>	Sample Matrix <i>SS</i>	No. of Samples <i>9</i>	Samples Received Under Chain-of-Custody? ☒ Yes ☐ No
Samples Checked For ☒ Preservation ☐ Container Integrity ☐ Sample Size ☐ Sample Integrity <i>NONE</i>		Condition of Sample Received ☒ Acceptable ☐ Not Acceptable (Complete an SRD Record)		

REQUESTED ANALYSES

Inorganic	Organics	Re...
		<i>PU-238 H-3</i> <i>PU-239 90 moisture</i> <i>OM-241 9300L</i> <i>U-234</i> <i>U-235</i> <i>U-238</i>
Request No.	Request No.	Request No.
Comments		
Collection Date: <i>See Project description</i>		
Customer Signature <i>Luis N...</i>		Date <i>6/19/97</i>
Sample Management Custodian Signature <i>Diana L. Decker</i>		Date <i>6/19/97</i>

WILLIAM K. DESS

Los Alamos, New Mexico 87545

Health and Environmental Che.
Mail Stop K-484
Los Alamos, NM 87545

rup

CHAIN OF CUSTODY RECORD

PROJ NO.		PROJECT NAME		NO. OF CONTAINERS		REMARKS	
SAMPLERS (Signature)		STATION LOCATION		LABEL NO.		REMARKS	
Paul T. Davis, Tony Trenchard, Dave Handwerker Debbie Dransfield		341 Rm 150-4 341 Rm 150-4 341 Rm 150-4		341 Rm 150-4 341 Rm 150-4 341 Rm 150-4		S ³ H short fuel W ³ H " " " " " " E ⁹ S New PCT W of TRU Pods 13 & 14 TRU pod #3 TRU pod #4 Pods #7 & 24 Expanding Area Berkel (BNP)	
STA NO.	DATE	TIME	STATION LOCATION	NO. OF CONTAINERS	REMARKS	Relinquished by: (Signature)	Received by: (Signature)
	6/16	10:30	1				
	6/16	10:30	2				
	6/17	11:30	3				
	6/17	9:30	4				
	6/17	10:30	5				
	6/17	10:30	6				
	6/17	10:50	7				
	6/17	12:00	8				
	6/17	1:30	9				
Relinquished by: (Signature)		Date / Time		Relinquished by: (Signature)		Date / Time	
Debbie Dransfield		6/19/77 10:03		Paula L. Decker			
Relinquished by: (Signature)		Date / Time		Relinquished by: (Signature)		Date / Time	
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time	

Distribution Original Accompanies Shipment. Copy to Field Files

A-38

APPENDIX B

**CST ANALYTICAL REPORTS OF RADIONUCLIDES IN
WASHED VEGETATION SAMPLES AT AREA G**

B-ii

Los Alamos
NATIONAL LABORATORY
memorandum
Chemical Science and Technology
Responsible Chemistry for America
CST-9/Inorganic Trace Analysis
Los Alamos, New Mexico 87545

To/MS: Philip R. Fresquez/MS 887
From/MS: Claudine Armenta, CST-9/K484
Phone/FAX: 7-3269/5-5982
Symbol: CST-9/98
Date: March 10, 1998

This is a Case Narrative for the following:

Submission Number : 100020922
Analysis : Americium in Biological Samples

I. Introduction

On July 14, 1997 (16) samples were received for analysis.

II. Analytical Results/Methodology

The analytical results are presented as indicated by the terms on the CST-3 Analytical Service Agreement. Each set of data will include sample identification information, the analytical results, and other information as required by ESH-20.

The analysis requested is: Isotopic Americium LA-10300-M, Vol. III, Americium in Environmental Matrices-Alpha Spectrometry, Method ER-121.

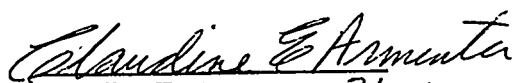
III. Quality Control

Laboratory control samples are prepared and analyzed with each sample request.

IV. Comments

Sixteen samples were analyzed for Americium-241. These samples were spiked with Americium-243. The following samples have low recoveries: 200032403, 200032407, 200032408, 200032409, 200032410, 200032411, 200032415, 200032416, 200032418. The following are the recoveries respectively: 10%, 21%, 6%, 7%, 15%, 16%, 13%, 22%, 18%. We try to maintain standard percent recovery of 30%. There was no complications in the process of analyzing the sample. There may be a slight interference with the matrix causing the low recovery. There was no activity in the Americium-241 area. The blind Q.C. 200032425's recovery was 75% and fell Under Control. Proves to me that the low recovery was isolated to the previous samples mentioned. There is a portion of sample for possible re-runs.

I verify, to the best of my knowledge, that the listed results are and both complete and technically correct, with the exception of the items detailed above.


Claudine E. Armenta 3/10/98

4929
B-1

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

10-Mar-1998 14:33

Submission Id : 100020922

Method Area: EH-ALPHA

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	M34A02106CA3	Due Date:	11-SEP-97
Requester Group:	ESH-20	Logged Date:	14-JUL-97	Screening Data:	NO SCREENING DATA REQUIRED
Mall Stop:	M887	Study:	ESH20 BIOLOGICALS	Logged by:	DDECKER
Requester Phone:	667-0815	Analytical Service Agreement #:			
Requester Fax #:	667-0731				

CUSTOMER SAMPLES

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
AM RAS ENV	200032403	300098448	W-1-OS	Am-241	0.0368	0.0071	pCi/g	
			W-1-OS	Am-243T Spike	1.95		pCi	
			W-1-OS	Am-243T Recovery	10.24		%	
			W-1-OS	Am-243T Recovered	0.2		pCi	
			W-1-OS	Am-241 Gross Counts	42		counts	
			W-1-OS	Am-241 Background Counts	6.8		counts	
			W-1-OS	Efficiency	31.70		%	
	200032407	300098452	W-1-OS	Count Time	3000.00	0.0042	min	
			W-1-OS	Analysis Date	02/23/98		MM/DD/YY	
			W-1-OS	Instrument	ALPHA 32		NONE	
			W-1-US	Am-241	0.0291		pCi/g	
			W-1-US	Am-243T Spike	1.95		pCi	
			W-1-US	Am-243T Recovery	20.99		%	
			W-1-US	Am-243T Recovered	0.41		pCi	
			W-1-US	Am-241 Gross Counts	84		counts	
			W-1-US	Am-241 Background Counts	15.0		counts	
			W-1-US	Efficiency	29.56		%	
			W-1-US	Count Time	3000.00		min	
			W-1-US	Analysis Date	02/23/98		MM/DD/YY	

**** FINAL REPORT ****

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Submission Id : 100020922

Method Area: EH-ALPHA

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
AM RAS ENV	200032407	300098452	W-1-US	Instrument	ALPHA 32		NONE	
	200032408	300098456	W-2-US	Am-241	0.0179	0.0076	pCi/g	
			W-2-US	Am-243T Spike	1.95		pCi	
			W-2-US	Am-243T Recovery	6.35		%	
			W-2-US	Am-243T Recovered	0.12		pCi	
			W-2-US	Am-241 Gross Counts	15		counts	
			W-2-US	Am-241 Background Counts	5.4		counts	
			W-2-US	Efficiency	30.10		%	
			W-2-US	Count Time	3000.00		min	
			W-2-US	Analysis Date	02/23/98		MM/DD/YY	
			W-2-US	Instrument	ALPHA 32		NONE	
	200032409	300098460	W-2-US	Am-241	0.0084	0.0039	pCi/g	
			W-2-US	Am-243T Spike	1.95		pCi	
			W-2-US	Am-243T Recovery	7.15		%	
			W-2-US	Am-243T Recovered	0.14		pCi	
			W-2-US	Am-241 Gross Counts	8		counts	
			W-2-US	Am-241 Background Counts	1.6		counts	
			W-2-US	Efficiency	30.56		%	
			W-2-US	Count Time	3000.00		min	
			W-2-US	Analysis Date	02/23/98		MM/DD/YY	
			W-2-US	Instrument	ALPHA 32		NONE	
	200032410	300098464	W-3-US	Am-241	0.1034	0.0120	pCi/g	
			W-3-US	Am-243T Spike	1.95		pCi	
			W-3-US	Am-243T Recovery	14.95		%	
			W-3-US	Am-243T Recovered	0.29		pCi	
			W-3-US	Am-241 Gross Counts	101		counts	
			W-3-US	Am-241 Background Counts	4.4		counts	

***** FINAL REPORT *****

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Submission Id : 100020922

Method Area: EH-ALPHA

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
AM RAS ENV	200032410	300098464	W-3-OS	Efficiency	32.36		%	
			W-3-OS	Count Time	3000.00		min	
			W-3-OS	Analysis Date	02/23/98		MM/DD/YY	
			W-3-OS	Instrument	ALPHA 32		NONE	
	200032411	300098468	W-3-US	Am-241	0.0554	0.0078	pCi/g	
			W-3-US	Am-243T Spike	1.95		pCi	
			W-3-US	Am-243T Recovery	15.79		%	
			W-3-US	Am-243T Recovered	0.31		pCi	
			W-3-US	Am-241 Gross Counts	67		counts	
			W-3-US	Am-241 Background Counts	4.2		counts	
			W-3-US	Efficiency	30.64		%	
			W-3-US	Count Time	3000.00		min	
			W-3-US	Analysis Date	02/23/98		MM/DD/YY	
			W-3-US	Instrument	ALPHA 32		NONE	
			W-4-OS	Am-241	0.1138	0.0059	pCi/g	
			W-4-OS	Am-243T Spike	1.95		pCi	
			W-4-OS	Am-243T Recovery	80.32		%	
			W-4-OS	Am-243T Recovered	1.57		pCi	
	200032412	300098472	W-4-OS	Am-241 Gross Counts	754		counts	
			W-4-OS	Am-241 Background Counts	7.8		counts	
			W-4-OS	Efficiency	30.81		%	
			W-4-OS	Count Time	3000.00		min	
			W-4-OS	Analysis Date	02/23/98		MM/DD/YY	
			W-4-OS	Instrument	ALPHA 32		NONE	
			W-4-US	Am-241	0.0347	0.0033	pCi/g	
			W-4-US	Am-243T Spike	1.95		pCi	
			W-4-US	Am-243T Recovery	59.75		%	
	200032413	300098476	W-4-US	Am-241	0.0347	0.0033	pCi/g	
			W-4-US	Am-243T Spike	1.95		pCi	
			W-4-US	Am-243T Recovery	59.75		%	
			W-4-US	Am-241	0.0347	0.0033	pCi/g	

**** FINAL REPORT ****

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Submission Id : 100020922

Method Area: EH-ALPHA

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
AM RAS ENV	200032413	300098476	W-4-US	Am-243T Recovered	1.17		pCi	
			W-4-US	Am-241 Gross Counts	149		counts	
			W-4-US	Am-241 Background Counts	8.0		counts	
			W-4-US	Efficiency	31.19		%	
			W-4-US	Count Time	3000.00		min	
	200032414	300098480	W-4-US	Analysis Date	02/23/98		MM/DD/YY	
			W-4-US	Instrument	ALPHA 32		NONE	
			W-5-US	Am-241	0.0592	0.0063	pCi/g	
			W-5-US	Am-243T Spike	1.95		pCi	
			W-5-US	Am-243T Recovery	32.55		%	
			W-5-US	Am-243T Recovered	0.63		pCi	
			W-5-US	Am-241 Gross Counts	116		counts	
			W-5-US	Am-241 Background Counts	4.8		counts	
			W-5-US	Efficiency	29.18		%	
			W-5-US	Count Time	3000.00		min	
			W-5-US	Analysis Date	02/23/98		MM/DD/YY	
			W-5-US	Instrument	ALPHA 32		NONE	
	200032415	300098484	W-6-US	Am-241	0.0619	0.0073	pCi/g	
			W-6-US	Am-243T Spike	1.95		pCi	
			W-6-US	Am-243T Recovery	13.13		%	
			W-6-US	Am-243T Recovered	0.26		pCi	
			W-6-US	Am-241 Gross Counts	106		counts	
			W-6-US	Am-241 Background Counts	6.4		counts	
			W-6-US	Efficiency	31.02		%	
			W-6-US	Count Time	3000.00		min	
			W-6-US	Analysis Date	02/23/98		MM/DD/YY	
			W-6-US	Instrument	ALPHA 32		NONE	

**** FINAL REPORT ****

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Method Area: EH-ALPHA

Submission Id : 100020922

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
AM RAS ENV	200032416	300098488	W-7-US	Am-241	0.0663	0.0068	pCi/g	
			W-7-US	Am-243T Spike	1.95		pCi	
			W-7-US	Am-243T Recovery	21.64		%	
			W-7-US	Am-243T Recovered	0.42		pCi	
			W-7-US	Am-241 Gross Counts	134		counts	
			W-7-US	Am-241 Background Counts	4.8		counts	
			W-7-US	Efficiency	27.80		%	
			W-7-US	Count Time	3000.00		min	
			W-7-US	Analysis Date	02/23/98		MM/DD/YY	
			W-7-US	Instrument	ALPHA 32		NONE	
	200032417	300098492	W-8-OS	Am-241	0.0123	0.0015	pCi/g	
			W-8-OS	Am-243T Spike	1.95		pCi	
			W-8-OS	Am-243T Recovery	79.36		%	
			W-8-OS	Am-243T Recovered	1.55		pCi	
			W-8-OS	Am-241 Gross Counts	82		counts	
			W-8-OS	Am-241 Background Counts	3.2		counts	
			W-8-OS	Efficiency	33.31		%	
			W-8-OS	Count Time	3000.00		min	
			W-8-OS	Analysis Date	02/23/98		MM/DD/YY	
			W-8-OS	Instrument	ALPHA 32		NONE	
	200032418	300098496	W-8-US	Am-241	0.0052	0.0020	pCi/g	
			W-8-US	Am-243T Spike	1.95		pCi	
			W-8-US	Am-243T Recovery	18.19		%	
			W-8-US	Am-243T Recovered	0.35		pCi	
			W-8-US	Am-241 Gross Counts	19		counts	
			W-8-US	Am-241 Background Counts	7.2		counts	
			W-8-US	Efficiency	31.05		%	

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**** FINAL REPORT ****

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Submission Id : 100020922

Method Area: EH-ALPHA

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
AM RAS ENV	200032418	300098496	W-8-US	Count Time	3000.00		min	
			W-8-US	Analysis Date	02/23/98		MM/DD/YY	
	200032419	300098500	W-8-US	Instrument	ALPHA 32		NONE	
			W-9-OS	Am-241	0.0132	0.0015	pCi/g	
			W-9-OS	Am-243T Spike	1.95		pCi	
			W-9-OS	Am-243T Recovery	71.38		%	
			W-9-OS	Am-243T Recovered	1.39		pCi	
			W-9-OS	Am-241 Gross Counts	99		counts	
			W-9-OS	Am-241 Background Counts	5.4		counts	
			W-9-OS	Efficiency	31.90		%	
			W-9-OS	Count Time	3000.00		min	
			W-9-OS	Analysis Date	02/23/98		MM/DD/YY	
			W-9-OS	Instrument	ALPHA 32		NONE	
			W-9-US	Am-241	0.0034	0.0006	pCi/g	
			W-9-US	Am-243T Spike	1.95		pCi	
			W-9-US	Am-243T Recovery	89.35		%	
			W-9-US	Am-243T Recovered	1.74		pCi	
	200032420	300098504	W-9-US	Am-241 Gross Counts	44		counts	
			W-9-US	Am-241 Background Counts	5.6		counts	
			W-9-US	Efficiency	32.56		%	
			W-9-US	Count Time	3000.00		min	
			W-9-US	Analysis Date	02/23/98		MM/DD/YY	
			W-9-US	Instrument	ALPHA 32		NONE	

DUPLICATE TASKS

None run for this submission

**** FINAL REPORT ****

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10-Mar-1998 14:33

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Method Area: EH-ALPHA

Submission Id : 100020922

SAMPLE SPIKES

None run for this submission

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**** FINAL REPORT ****

11/4/29

10-Mar-1998 14:33

Submission Id : 100020922

Method Area: EH-ALPHA

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result</u> <u>Value</u>	<u>Uncertainty</u>	<u>Units</u> pCi/g	<u>Qualifier</u>	<u>QC</u>		<u>QC</u> <u>Evaluation</u>
							<u>Value</u>	<u>Uncertainty</u>	
00.36195	300131506	Am-241	8.8851	0.3529	pCi/g		9	.4	UNDER CONTROL

METHOD BLANKS

None run for this submission

OPEN QC

None run for this submission

B-9

**** FINAL REPORT ****

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Method Area: EH-ALPHA

Submission Id : 100020922

CBT
AnalystSTB
ReviewCBZ
Team LeaderNK
QA Officer3/10/98
Date3/11/98
Date3/11/98
Date3/11/98
Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level."

**** FINAL REPORT ****

13 a/29

B-10

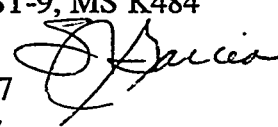
Los Alamos

NATIONAL LABORATORY

memorandum

Chemical Science & Technology
Inorganic Trace Analysis, CST-9
MS K484
Los Alamos, New Mexico 87545
(505) 667-3269
FAX (505) 665-6561

To/MS: Phillip R. Fresquez, MS M887
From/MS: S. R. Garcia, CST-9, MS K484
Phone/FAX: 5-0270/5-5982
Symbol: CST-9-PRF-97-7
Date: August 29, 1997



SUBJECT: SUBMISSION ID 100020922 ¹³⁷Cs RESULTS IN VEGETATION ASH

Please be advised that the ¹³⁷Cs results for SUBMISSION ID 100020922 have been reported and entered into the new CST-SQL-LIMS database. Both open and blind QC's were *in control*. (refer to analytical report for the blind QC results) The open QC and method blank results are listed below as there were CST SQL_LIMS problems associated with these.

<u>Sample ID</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncer.</u>	<u>Units</u>	<u>QC Value</u>	<u>QC Uncert.</u>	<u>QC Units</u>	<u>QC Evaluation</u>
00.33114	Cs-137	42.5	2.6	pCi/g	42.0	1.4	pCi/g	Under Control
Open QC								
00.22784	Cs-137	0.04	0.06	pCi/g	0.0		pCi/g	Under Control
Blank								

Duplicate sample results(i.e., duplicate task) There was not enough ash sample to prepare a duplicate sample.

Should you have any questions concerning this request number, please feel free to call or send an e-mail message to me at....sgarcia@lims1.lanl.gov.

Method Area: EH-GAMMA

Submission Id: 100020922

Requester Name :	PHIL FRESQUEZ	Customer Cost Code:	M34A02106CA3	Due Date :	11-SEP-97
Requester Group:	ESH-20	Logged Date :	14-JUL-97	Screening Data :	NO SCREENING DATA REQUIRED
Mail Stop :	M887			Logged by:	DDECKER
Requester Phone:	667-0815				
Requester Fax #:	667-0731	Analytical Service Agreement #:			

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC GAMMA	200032403	300098446	W-1-OS	CS-137	0.15	0.22	pCi/g	
	200032407	300098450	W-1-US	CS-137	0.49	0.73	pCi/g	
	200032408	300098454	W-2-OS	CS-137	0.16	0.23	pCi/g	
	200032409	300098458	W-2-US	CS-137	0.29	0.09	pCi/g	
	200032410	300098462	W-3-OS	CS-137	0.75	0.16	pCi/g	
	200032411	300098466	W-3-US	CS-137	0.44	0.66	pCi/g	
	200032412	300098470	W-4-OS	CS-137	0.40	0.60	pCi/g	
	200032413	300098474	W-4-US	CS-137	0.79	0.18	pCi/g	
	200032414	300098478	W-5-US	CS-137	0.65	0.14	pCi/g	
	200032415	300098482	W-6-US	CS-137	0.16	0.24	pCi/g	
	200032416	300098486	W-7-US	CS-137	-0.05	1.80	pCi/g	
	200032417	300098490	W-8-OS	CS-137	-0.13	1.80	pCi/g	
	200032418	300098494	W-8-US	CS-137	0.22	0.32	pCi/g	
	200032419	300098498	W-9-OS	CS-137	-0.02	1.80	pCi/g	
	200032420	300098502	W-9-US	CS-137	0.58	0.87	pCi/g	

DUPLICATE TASKS

None run for this submission

***** FINAL REPORT *****

B-12

Method Area: EH-GAMMA

Submission Id : 100020922

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

Customer Id	Task Id	Component	Result	Uncertainty	Units	Qualifier	QC Value	QC Uncertainty	QC units	QC Evaluation
00.36892	300098506	CS-137	10.9	1.0	pCi/g		11.7	.39		UNDER CONTROL

OPEN QC

None run for this submission

*See memo**B-13*

**** FINAL REPORT ****

Method Area: EH-GAMMA

Submission Id: 100020922


Analyst
Review
Team Leader
QA Officer8/29/97
Date8/29/97
Date9/2/97
Date9/4/97
Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level."

***** FINAL REPORT *****

B-14

Method Area: EH-ALPHA

Submission Id : 100020922

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	M34A02106CA3	Due Date:	11-SEP-97
Requester Group:	ESH-20	Logged Date:	14-JUL-97	Screening Data:	NO SCREENING DATA REQUIRED
Mail Stop:	M887	Study:	ESH20 BIOLOGICALS	Logged by:	DDECKER
Requester Phone:	667-0815	Analytical Service Agreement #:			
Requester Fax #:	667-0731				

CUSTOMER SAMPLES

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
U RAS ENV	200032403	3000b8449	W-1-OS	U-234	0.2631	0.0150	pCi/g	
			W-1-OS	U-235	0.0095	0.0019	pCi/g	
			W-1-OS	U-238	0.2538	0.0146	pCi/g	
			W-1-OS	U-234 Gross Counts	719		counts	
			W-1-OS	U-234 Background Counts	5.4		counts	
			W-1-OS	U-235 Gross Counts	26		counts	
			W-1-OS	U-235 Background Counts	0.2		counts	
			W-1-OS	U-238 Gross Counts	689		counts	
			W-1-OS	U-238 Background Counts	0.8		counts	
			W-1-OS	U-232T Spike	1.56		pCi	
			W-1-OS	U-232T Recovery	89.40		%	
			W-1-OS	Efficiency	23.13		%	
			W-1-OS	Count Time	1333.33		min	
			W-1-OS	Analysis Date	1/22/98		MM/DD/YY	
			W-1-OS	Instrument	ALPHA 112		NONE	
	200032407	300098453	W-1-US	U-234	0.1634	0.0108	pCi/g	
			W-1-US	U-235	0.0034	0.0012	pCi/g	
			W-1-US	U-238	0.1155	0.0084	pCi/g	
			W-1-US	U-234 Gross Counts	459		counts	

***** FINAL REPORT *****

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Method Area: EH-ALPHA

Submission Id : 100020922

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
URAS ENV	200032407	300098453	W-1-US	U-234 Background Counts	3.0		counts	
			W-1-US	U-235 Gross Counts	11		counts	
			W-1-US	U-235 Background Counts	1.6		counts	
			W-1-US	U-238 Gross Counts	324		counts	
			W-1-US	U-238 Background Counts	1.8		counts	
			W-1-US	U-232T Spike	1.56		pCi	
			W-1-US	U-232T Recovery	72.02		%	
			W-1-US	Efficiency	22.84		%	
			W-1-US	Count Time	1333.33		min	
			W-1-US	Analysis Date	1/22/98		MM/DD/YY	
	200032408	300098457	W-1-US	Instrument	ALPHA 112		NONE	
			W-2-OS	U-234	0.2777	0.0154	pCi/g	
			W-2-OS	U-235	0.0103	0.0020	pCi/g	
			W-2-OS	U-238	0.2803	0.0155	pCi/g	
			W-2-OS	U-234 Gross Counts	769		counts	
			W-2-OS	U-234 Background Counts	3.2		counts	
			W-2-OS	U-235 Gross Counts	30		counts	
			W-2-OS	U-235 Background Counts	1.6		counts	
			W-2-OS	U-238 Gross Counts	775		counts	
			W-2-OS	U-238 Background Counts	1.8		counts	
	200032409	300098461	W-2-OS	U-232T Spike	1.56		pCi	
			W-2-OS	U-232T Recovery	98.85		%	
			W-2-OS	Efficiency	22.44		%	
			W-2-OS	Count Time	1333.33		min	
			W-2-OS	Analysis Date	1/22/98		MM/DD/YY	
			W-2-OS	Instrument	ALPHA 112		NONE	
			W-2-US	U-234	0.1924	0.0118	pCi/g	

**** FINAL REPORT ****

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Submission Id : 100020922

Method Area: EH-ALPHA

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
U RAS ENV	200032409	300098461	W-2-US	U-235	0.0081	0.0018	pCi/g	
			W-2-US	U-238	0.1578	0.0101	pCi/g	
			W-2-US	U-234 Gross Counts	567		counts	
			W-2-US	U-234 Background Counts	4.2		counts	
			W-2-US	U-235 Gross Counts	25		counts	
			W-2-US	U-235 Background Counts	1.4		counts	
			W-2-US	U-238 Gross Counts	464		counts	
			W-2-US	U-238 Background Counts	2.4		counts	
			W-2-US	U-232T Spike	1.56		pCi	
			W-2-US	U-232T Recovery	78.06		%	
	200032410	300098465	W-2-US	Efficiency	24.16		%	
			W-2-US	Count Time	1333.33		min	
			W-2-US	Analysis Date	1/22/98		MM/DD/YY	
			W-2-US	Instrument	ALPHA 112		NONE	
			W-3-OS	U-234	1.0476	0.0521	pCi/g	
			W-3-OS	U-235	0.0355	0.0049	pCi/g	
			W-3-OS	U-238	0.8647	0.0441	pCi/g	
			W-3-OS	U-234 Gross Counts	1771		counts	
			W-3-OS	U-234 Background Counts	5.4		counts	
			W-3-OS	U-235 Gross Counts	61		counts	
			W-3-OS	U-235 Background Counts	1.2		counts	
			W-3-OS	U-238 Gross Counts	1460		counts	
			W-3-OS	U-238 Background Counts	2.6		counts	
			W-3-OS	U-232T Spike	1.56		pCi	
			W-3-OS	U-232T Recovery	81.63		%	
			W-3-OS	Efficiency	24.05		%	
			W-3-OS	Count Time	1333.33		min	

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**** FINAL REPORT ****

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Method Area: EH-ALPHA

Submission Id: 100020922

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
U RAS ENV	200032410	300098465	W-3-OS	Analysis Date	1/22/98		MM/DD/YY	
			W-3-OS	Instrument	ALPHA 112		NONE	
	200032411	300098469	W-3-US	U-234	0.1494	0.0109	pCi/g	
			W-3-US	U-235	0.0040	0.0015	pCi/g	
			W-3-US	U-238	0.1265	0.0097	pCi/g	
			W-3-US	U-234 Gross Counts	305		counts	
			W-3-US	U-234 Background Counts	3.6		counts	
			W-3-US	U-235 Gross Counts	9		counts	
			W-3-US	U-235 Background Counts	1.0		counts	
			W-3-US	U-238 Gross Counts	258		counts	
			W-3-US	U-238 Background Counts	2.8		counts	
			W-3-US	U-232T Spike	1.56		pCi	
			W-3-US	U-232T Recovery	87.18		%	
			W-3-US	Efficiency	22.21		%	
			W-3-US	Count Time	1333.33		min	
			W-3-US	Analysis Date	1/22/98		MM/DD/YY	
			W-3-US	Instrument	ALPHA 112		NONE	
	200032412	300098473	W-4-OS	U-234	0.4157	0.0220	pCi/g	
			W-4-OS	U-235	0.0150	0.0026	pCi/g	
			W-4-OS	U-238	0.3496	0.0191	pCi/g	
			W-4-OS	U-234 Gross Counts	1044		counts	
			W-4-OS	U-234 Background Counts	7.2		counts	
			W-4-OS	U-235 Gross Counts	39		counts	
			W-4-OS	U-235 Background Counts	1.6		counts	
			W-4-OS	U-238 Gross Counts	875		counts	
			W-4-OS	U-238 Background Counts	3.0		counts	
			W-4-OS	U-232T Spike	1.56		pCi	

***** FINAL REPORT *****

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Method Area: EH-ALPHA

Submission Id : 100020922

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
U RAS ENV	200032412	300098473	W-4-US	U-232T Recovery	93.76		%	
				Efficiency	22.58		%	
				Count Time	1333.33		min	
				Analysis Date	1/22/98		MM/DD/YY	
				Instrument	ALPHA 112		NONE	
	200032413	300098477	W-4-US	U-234	0.1715	0.0117	pCi/g	
				U-235	0.0035	0.0014	pCi/g	
				U-238	0.1466	0.0104	pCi/g	
				U-234 Gross Counts	369		counts	
				U-234 Background Counts	7.0		counts	
			W-4-US	U-235 Gross Counts	8		counts	
				U-235 Background Counts	0.6		counts	
				U-238 Gross Counts	311		counts	
				U-238 Background Counts	1.6		counts	
				U-232T Spike	1.56		pCi	
			W-4-US	U-232T Recovery	91.52		%	
				Efficiency	23.83		%	
				Count Time	1333.33		min	
				Analysis Date	1/22/98		MM/DD/YY	
				Instrument	ALPHA 112		NONE	
	200032414	300098481	W-5-US	U-234	0.3261	0.0192	pCi/g	
				U-235	0.0090	0.0024	pCi/g	
				U-238	0.2664	0.0165	pCi/g	
				U-234 Gross Counts	616		counts	
				U-234 Background Counts	6.4		counts	
			W-5-US	U-235 Gross Counts	19		counts	
				U-235 Background Counts	2.2		counts	

**** FINAL REPORT ****

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Method Area: EH-ALPHA

Submission Id : 100020922

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
U RAS ENV	200032414	300098481	W-5-US	U-238 Gross Counts	500		counts	
			W-5-US	U-238 Background Counts	2.0		counts	
			W-5-US	U-232T Spike	1.56		pCi	
			W-5-US	U-232T Recovery	92.16		%	
			W-5-US	Efficiency	23.07		%	
			W-5-US	Count Time	1333.33		min	
			W-5-US	Analysis Date	1/22/98		MM/DD/YY	
			W-5-US	Instrument	ALPHA 112		NONE	
			W-6-US	U-234	0.3789	0.0196	pCi/g	
			W-6-US	U-235	0.0128	0.0021	pCi/g	
			W-6-US	U-238	0.3254	0.0172	pCi/g	
			W-6-US	U-234 Gross Counts	1311		counts	
			W-6-US	U-234 Background Counts	4.2		counts	
			W-6-US	U-235 Gross Counts	47		counts	
			W-6-US	U-235 Background Counts	2.8		counts	
			W-6-US	U-238 Gross Counts	1125		counts	
			W-6-US	U-238 Background Counts	2.6		counts	
	200032415	300098485	W-6-US	U-232T Spike	1.56		pCi	
			W-6-US	U-232T Recovery	89.29		%	
			W-6-US	Efficiency	22.01		%	
			W-6-US	Count Time	1333.33		min	
			W-6-US	Analysis Date	1/22/98		MM/DD/YY	
			W-6-US	Instrument	ALPHA 112		NONE	
			W-7-US	U-234	0.1417	0.0094	pCi/g	
			W-7-US	U-235	0.0055	0.0015	pCi/g	
			W-7-US	U-238	0.1228	0.0085	pCi/g	
			W-7-US	U-234 Gross Counts	409		counts	
			W-7-US					

**** FINAL REPORT ****

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Method Area: EH-ALPHA

Submission Id : 100020922

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
U RAS ENV	200032416	300098489	W-7-US	U-234 Background Counts	6.6		counts	
			W-7-US	U-235 Gross Counts	17		counts	
			W-7-US	U-235 Background Counts	1.4		counts	
			W-7-US	U-238 Gross Counts	351		counts	
			W-7-US	U-238 Background Counts	2.2		counts	
			W-7-US	U-232T Spike	1.56		pCi	
			W-7-US	U-232T Recovery	93.90		%	
			W-7-US	Efficiency	21.02		%	
			W-7-US	Count Time	1333.33		min	
			W-7-US	Analysis Date	1/22/98		MM/DD/YY	
			W-7-US	Instrument	ALPHA 112		NONE	
			W-8-OS	U-234	0.2132	0.0137	pCi/g	
			W-8-OS	U-235	0.0043	0.0016	pCi/g	
			W-8-OS	U-238	0.1884	0.0125	pCi/g	
			W-8-OS	U-234 Gross Counts	458		counts	
			W-8-OS	U-234 Background Counts	2.8		counts	
			W-8-OS	U-235 Gross Counts	11		counts	
	200032417	300098493	W-8-OS	U-235 Background Counts	1.8		counts	
			W-8-OS	U-238 Gross Counts	405		counts	
			W-8-OS	U-238 Background Counts	2.8		counts	
			W-8-OS	U-232T Spike	1.56		pCi	
			W-8-OS	U-232T Recovery	83.40		%	
			W-8-OS	Efficiency	23.70		%	
			W-8-OS	Count Time	1333.33		min	
			W-8-OS	Analysis Date	1/22/98		MM/DD/YY	
			W-8-OS	Instrument	ALPHA 112		NONE	
			W-8-US	U-234	0.1365	0.0084	pCi/g	
			W-8-US					
			W-8-US					
			W-8-US					
			W-8-US					
			W-8-US					
			W-8-US					
			W-8-US					

**** FINAL REPORT ****

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Method Area: EH-ALPHA

Submission Id : 100020922

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
URAS ENV	200032418	300098497	W-8-US	U-235	0.0062	0.0013	pCi/g	
			W-8-US	U-238	0.1141	0.0074	pCi/g	
			W-8-US	U-234 Gross Counts	519		counts	
			W-8-US	U-234 Background Counts	4.2		counts	
			W-8-US	U-235 Gross Counts	24		counts	
			W-8-US	U-235 Background Counts	0.6		counts	
			W-8-US	U-238 Gross Counts	432		counts	
			W-8-US	U-238 Background Counts	1.8		counts	
			W-8-US	U-232T Spike	1.56		pCi	
			W-8-US	U-232T Recovery	92.13		%	
	200032419	300098501	W-8-US	Efficiency	22.86		%	
			W-8-US	Count Time	1333.33		min	
			W-8-US	Analysis Date	1/22/98		MM/DD/YY	
			W-8-US	Instrument	ALPHA 112		NONE	
			W-9-OS	U-234	0.1651	0.0105	pCi/g	
			W-9-OS	U-235	0.0046	0.0014	pCi/g	
			W-9-OS	U-238	0.1509	0.0098	pCi/g	
			W-9-OS	U-234 Gross Counts	467		counts	
			W-9-OS	U-234 Background Counts	4.2		counts	
			W-9-OS	U-235 Gross Counts	14		counts	
			W-9-OS	U-235 Background Counts	1.0		counts	
			W-9-OS	U-238 Gross Counts	426		counts	
			W-9-OS	U-238 Background Counts	3.2		counts	
			W-9-OS	U-232T Spike	1.56		pCi	
			W-9-OS	U-232T Recovery	91.35		%	
			W-9-OS	Efficiency	22.15		%	
			W-9-OS	Count Time	1333.33		min	

**** FINAL REPORT ****

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Method Area: EH-ALPHA

Submission Id : 100020922

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
U RAS ENV	200032419	300098501	W-9-US	Analysis Date	1/22/98		MM/DD/YY	
			W-9-US	Instrument	ALPHA 112		NONE	
	200032420	300098505	W-9-US	U-234	0.1343	0.0097	pCi/g	
			W-9-US	U-235	0.0026	0.0011	pCi/g	
			W-9-US	U-238	0.0923	0.0074	pCi/g	
			W-9-US	U-234 Gross Counts	352		counts	
			W-9-US	U-234 Background Counts	4.0		counts	
			W-9-US	U-235 Gross Counts	8		counts	
			W-9-US	U-235 Background Counts	1.2		counts	
			W-9-US	U-238 Gross Counts	241		counts	
			W-9-US	U-238 Background Counts	1.8		counts	
			W-9-US	U-232T Spike	1.56		pCi	
			W-9-US	U-232T Recovery	78.92		%	
			W-9-US	Efficiency	18.92		%	
			W-9-US	Count Time	1333.33		min	
			W-9-US	Analysis Date	1/22/98		MM/DD/YY	
			W-9-US	Instrument	ALPHA 112		NONE	

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DUPLICATE TASKS

None run for this submission

SAMPLE SPIKES

None run for this submission

**** FINAL REPORT ****

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Method Area: EH-ALPHA

Submission Id : 100020922

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	Qualifier	QC Value	QC Uncertainty	QC units	QC Evaluation
00.34911	300098508	U-234	2.1096	0.1145	pCi/g		2.07	0.207	pCi/g	UNDER CONTROL
		U-235	0.1067	0.0153	pCi/g		0.098	0.0098	pCi/g	UNDER CONTROL
		U-238	2.1256	0.1151	pCi/g		2.07	0.207	pCi/g	UNDER CONTROL

METHOD BLANKS

None run for this submission

OPEN QC

None run for this submission

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***** FINAL REPORT *****

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Method Area: EH-ALPHA

Submission Id : 100020922

CEA
Analyst

EW
Reviewer

CE
Team Leader

mag
QA Officer

1/26/98
Date

1-28-98
Date

1/28/98
Date

1/28/98
Date

B-25

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level."

**** FINAL REPORT ****

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Los Alamos

NATIONAL LABORATORY

memorandum

Chemical Science and Technology

Responsible Chemistry for America

CST-9/Inorganic Trace Analysis

Los Alamos, New Mexico 87545

To/MS: File

From/MS: Claudine Armenta, CST-9/K484

Phone/FAX: 7-3269/5-5982

Symbol: CST-9/98

Date: February 18, 1998

This is a Case Narrative for the following:

Request Number : 100020922

Analysis : Plutonium in Biological Samples

I. Introduction

On July 14, 1997 (16) samples were received for analysis.

II. Analytical Results/Methodology

The analytical results are presented as indicated by the terms on the CST-3 Analytical Service Agreement. Each set of data will include sample identification information, the analytical results, and other information as required by ESH-20.

The analysis requested is: Isotopic Plutonium LA-10300-M, Vol. III, Plutonium in Environmental Matrices-Alpha Spectrometry, Method ER-160.

III. Quality Control

Laboratory control samples are prepared and analyzed with each sample request.

IV. Comments

In this report you will find two final reports with 8 samples with different results. In the data validation it was discovered that the final report did not match the raw data. In researching we found that the wrong csv. file was transferred into the report writer. The problem was corrected and the report was re-reported. The new report will be paginated as Amended 4 of 48 through 13 of 38.

I verify, to the best of my knowledge, that the listed results are and both complete and technically correct, with the exception of the item detailed above.

Claudine E. Armenta
Claudine E. Armenta 2/19/98

*I then altered
the report
3-6-98
mj.*

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LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Submission Id : 100020922

Method Area: EH-ALPHA

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	M34A02106CA3	Due Date:	11-SEP-97
Requester Group:	ESH-20	Logged Date:	14-JUL-97	Screening Data:	NO SCREENING DATA REQUIRED
Mail Stop:	M887	Study:	ESH20 BIOLOGICALS	Logged by:	DDECKER
Requester Phone:	667-0815	Analytical Service Agreement #:			
Requester Fax #:	667-0731				

CUSTOMER SAMPLES

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
PU RAS ENV	200032403	300098447	W-1-OS	Pu-238	0.0047	0.0010	pCi/g	
			W-1-OS	Pu-239	0.0132	0.0015	pCi/g	
			W-1-OS	Pu-242T Spike	1.95		pCi	
			W-1-OS	Pu-242T Recovery	69.20		%	
			W-1-OS	Pu-242T Recovered	1.35		pCi	
	200032407		W-1-US	Pu-238	0.0014	0.0004	pCi/g	
			W-1-US	Pu-239	0.0059	0.0008	pCi/g	
			W-1-US	Pu-242T Spike	1.95		pCi	
			W-1-US	Pu-242T Recovery	80.86		%	
			W-1-US	Pu-242T Recovered	1.58		pCi	
	200032408	300098455	W-2-OS	Pu-238	0.0029	0.0007	pCi/g	
			W-2-OS	Pu-239	0.0321	0.0024	pCi/g	
			W-2-OS	Pu-242T Spike	1.95		pCi	
			W-2-OS	Pu-242T Recovery	62.93		%	
			W-2-OS	Pu-242T Recovered	1.23		pCi	
	200032409	300098459	W-2-US	Pu-238	0.0011	0.0004	pCi/g	
			W-2-US	Pu-239	0.0081	0.0010	pCi/g	
			W-2-US	Pu-242T Spike	1.95		pCi	
			W-2-US	Pu-242T Recovery	62.08		%	
			W-2-US	Pu-242T Recovered				

**** FINAL REPORT ****

Amended 4/24/38

Method Area: EH-ALPHA

Submission Id : 100020922

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
PU RAS ENV	200032409	300098459	W-2-US	Pu-242T Recovered	1.21		pCi	
	200032410	300098463	W-3-OS	Pu-238	0.0137	0.0022	pCi/g	
			W-3-OS	Pu-239	0.1067	0.0069	pCi/g	
			W-3-OS	Pu-242T Spike	1.95		pCi	
			W-3-OS	Pu-242T Recovery	42.47		%	
			W-3-OS	Pu-242T Recovered	0.83		pCi	
			W-3-US	Pu-238	0.0034	0.0011	pCi/g	
	200032411	300098467	W-3-US	Pu-239	0.0210	0.0025	pCi/g	
			W-3-US	Pu-242T Spike	1.95		pCi	
			W-3-US	Pu-242T Recovery	70.73		%	
			W-3-US	Pu-242T Recovered	1.38		pCi	
			W-4-OS	Pu-238	0.0153	0.0016	pCi/g	
	200032412	300098471	W-4-OS	Pu-239	0.1204	0.0054	pCi/g	
			W-4-OS	Pu-242T Spike	1.95		pCi	
			W-4-OS	Pu-242T Recovery	77.53		%	
			W-4-OS	Pu-242T Recovered	1.51		pCi	
			W-4-US	Pu-238	0.0208	0.0022	pCi/g	
			W-4-US	Pu-239	0.0569	0.0039	pCi/g	
	200032413	300098475	W-4-US	Pu-242T Spike	1.95		pCi	
			W-4-US	Pu-242T Recovery	65.69		%	
			W-4-US	Pu-242T Recovered	1.28		pCi	
			W-5-US	Pu-238	0.0028	0.0012	pCi/g	
	200032414	300098479	W-5-US	Pu-239	0.0313	0.0033	pCi/g	
			W-5-US	Pu-242T Spike	1.95		pCi	
			W-5-US	Pu-242T Recovery	47.16		%	
			W-5-US	Pu-242T Recovered	0.92		pCi	
	200032415	300098483	W-6-US	Pu-238	0.0047	0.0017	pCi/g	

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**** FINAL REPORT ****

Amended 5/24/38

Method Area: EH-ALPHA

Submission Id : 100020922

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
PU RAS ENV	200032415	300098483	W-6-US	Pu-239	0.0318	0.0038	pCi/g	
			W-6-US	Pu-242T Spike	1.95		pCi	
			W-6-US	Pu-242T Recovery	19.57		%	
	200032416	300098487	W-6-US	Pu-242T Recovered	0.38		pCi	
			W-7-US	Pu-238	0.0036	0.0008	pCi/g	
			W-7-US	Pu-239	0.0822	0.0044	pCi/g	
	200032417	300098491	W-7-US	Pu-242T Spike	1.95		pCi	
			W-7-US	Pu-242T Recovery	57.18		%	
			W-7-US	Pu-242T Recovered	1.12		pCi	
	200032418	300098495	W-8-US	Pu-238	0.0001	0.0006	pCi/g	
			W-8-US	Pu-239	0.0192	0.0021	pCi/g	
			W-8-US	Pu-242T Spike	1.95		pCi	
	200032419	300098499	W-8-US	Pu-242T Recovery	56.00		%	
			W-8-US	Pu-242T Recovered	1.09		pCi	
			W-8-US	Pu-238	0.0000	0.0003	pCi/g	
	200032420	300098503	W-8-US	Pu-239	0.0070	0.0010	pCi/g	
			W-8-US	Pu-242T Spike	1.95		pCi	
			W-8-US	Pu-242T Recovery	63.28		%	
			W-8-US	Pu-242T Recovered	1.23		pCi	
			W-9-US	Pu-238	0.0009	0.0005	pCi/g	
			W-9-US	Pu-239	0.0035	0.0009	pCi/g	
			W-9-US	Pu-242T Spike	1.95		pCi	
			W-9-US	Pu-242T Recovery	52.81		%	
			W-9-US	Pu-242T Recovered	1.03		pCi	
			W-9-US	Pu-238	0.0002	0.0002	pCi/g	
			W-9-US	Pu-239	0.0029	0.0005	pCi/g	
			W-9-US	Pu-242T Spike	1.95		pCi	

**** FINAL REPORT ****

Amended to ap. 38

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Method Area: EH-ALPHA

Submission Id : 100020922

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
PU RAS ENV	200032420	300098503	W-9-US W-9-US	Pu-242T Recovery Pu-242T Recovered	81.08 1.58		% pCi	

DUPLICATE TASKS

None run for this submission

SAMPLE SPIKES

None run for this submission

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**** FINAL REPORT ****

Amended 7 of 38

19-Feb-1998 07:41

Submission Id : 100020922

Method Area: EH-ALPHA

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units pCi/g	Qualifier	QC Value	QC Uncertainty	QC units pCi/g	QC Evaluation UNDER CONTROL UNDER CONTROL
00.36195	300131505	Pu-238	6.0898	0.2198	pCi/g		6.2	.22		
		Pu-239	1.8638	0.0795	pCi/g		1.8	.058		

METHOD BLANKS

None run for this submission

OPEN QC

None run for this submission

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***** FINAL REPORT *****
Amended 8 of 35

Method Area: EH-ALPHA

Submission ID: 100020922

Eliff
Analyst

Eug
Review

Team Leader

may
QA Officer

2/19/98
Date

2-2498
Date

3/4/98
Date

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No Sample Discrepancies Noted by Sample Management Section

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

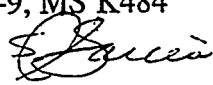
"The reported uncertainties are at the 1 sigma confidence level."

**** FINAL REPORT ****
Amended 9/24/38

Los Alamos
NATIONAL LABORATORY
memorandum

Chemical Science & Technology
Inorganic Trace Analysis, CST-9
MS K484
Los Alamos, New Mexico 87545
(505) 665-0270
FAX (505) 665-5952

To/MS: Phillip R. Fresquez, MS M887
From/MS: S. R. Garcia, CST-9, MS K484
Phone/FAX: 5-0270/5-5982
Symbol: CST-9-PRF-98-3
Date: May 5, 1998



**SUBJECT: SUBMISSION 100020922 GSCAN RESULTS IN VEGETATION
ASH**

Please be advised that the GSCAN results for submission id 100020922 have been reported and entered into the LIMS database. Both open and blind QC's were *in control*. As with most vegetation ash samples, there was not sufficient sample to generate a duplicate. The open QC results were previously reported with the CS-137 results and not included in this GSCAN addendum report.

Should you have any questions concerning this request number, please feel free to call or send an e-mail message to me at....[garcia_s@ lanl.gov](mailto:garcia_s@lanl.gov).

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LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

06-May-1998 13:10

Method Area: EH-GAMMA

Submission Id: 100020922

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	M34A02106CA3	Due Date:	11-SEP-97
Requester Group:	ESH-20	Logged Date:	14-JUL-97	Screening Data:	NO SCREENING DATA REQUIRED
Mail Stop:	M887	Study:	ESH20 BIOLOGICALS	Logged by:	DDECKER
Requester Phone:	667-0815	Analytical Service Agreement #:			
Requester Fax #:	667-0731				

CUSTOMER SAMPLES

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC GAMMA	200032403	300098446	W-1-OS	CS-137	0.15	0.22	pCi/g	
		300149422	W-1-OS	AC-228	1.18	0.22	pCi/g	
			W-1-OS	AM-241	0.50	0.75	pCi/g	
			W-1-OS	BE-7	58.09	5.93	pCi/g	
			W-1-OS	BI-214	0.60	0.90	pCi/g	
			W-1-OS	CO-57	0.37	0.00	pCi/g	
			W-1-OS	CO-60	0.26	0.39	pCi/g	
			W-1-OS	K-40	96.96	9.47	pCi/g	
			W-1-OS	MN-54	0.14	0.05	pCi/g	
			W-1-OS	NA-22	-0.01	0.21	pCi/g	
			W-1-OS	PA-234M	23.52	7.18	pCi/g	
			W-1-OS	PB-212	-0.06	0.24	pCi/g	
			W-1-OS	PB-214	0.66	0.13	pCi/g	
			W-1-OS	TL-208	0.65	0.12	pCi/g	
			W-1-OS	CS-137	0.49	0.73	pCi/g	
		200032407	300098450 300149423	W-1-US	AC-228	2.44	3.66	pCi/g
W-1-US	AM-241			5.03	0.80	pCi/g		
W-1-US	BE-7			81.52	8.43	pCi/g		
W-1-US	BI-214			1.08	0.22	pCi/g		

**** FINAL REPORT ****

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Method Area: EH-GAMMA

Submission Id: 100020922

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
GENERIC GAMMA	200032407	300149423	W-1-US	CO-57	0.29	0.06	pCi/g	
			W-1-US	CO-60	0.82	1.23	pCi/g	
			W-1-US	K-40	83.10	32.57	pCi/g	
			W-1-US	MN-54	-0.08	0.00	pCi/g	
			W-1-US	NA-22	-0.19	0.21	pCi/g	
			W-1-US	PA-234M	59.65	15.20	pCi/g	
			W-1-US	PB-212	1.71	2.56	pCi/g	
			W-1-US	PB-214	1.62	0.31	pCi/g	
			W-1-US	TL-208	0.59	0.38	pCi/g	
			W-2-US	GS-137	0.16	0.23	pCi/g	
			W-2-US	AC-228	1.72	0.38	pCi/g	
			W-2-US	AM-241	1.38	0.29	pCi/g	
			W-2-US	BE-7	74.65	7.48	pCi/g	
			W-2-US	BI-214	1.23	0.21	pCi/g	
			W-2-US	CO-57	0.34	0.07	pCi/g	
			W-2-US	CO-60	0.31	0.47	pCi/g	
			W-2-US	K-40	02.72	10.02	pCi/g	
			W-2-US	MN-54	-0.12	0.00	pCi/g	
			W-2-US	NA-22	0.39	0.09	pCi/g	
			W-2-US	PA-234M	74.52	15.72	pCi/g	
	200032409	300149426	W-2-US	PB-212	1.01	0.15	pCi/g	
			W-2-US	PB-214	1.46	0.24	pCi/g	
			W-2-US	TL-208	0.39	0.25	pCi/g	
			W-2-US	GS-137	0.29	0.09	pCi/g	
			W-2-US	AC-228	1.89	0.31	pCi/g	
			W-2-US	AM-241	0.22	0.33	pCi/g	
			W-2-US	BE-7	42.88	4.52	pCi/g	

**** FINAL REPORT ****

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Method Area: EH-GAMMA

Submission Id: 100020922

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
GENERIC GAMMA	200032409	300149426	W-2-US	BI-214	0.76	0.19	pCi/g	
			W-2-US	CO-57	0.47	0.00	pCi/g	
			W-2-US	CO-60	0.42	0.63	pCi/g	
			W-2-US	K-40	02.59	17.40	pCi/g	
			W-2-US	MN-54	-0.08	0.00	pCi/g	
			W-2-US	NA-22	0.17	0.26	pCi/g	
			W-2-US	PA-234M	11.53	17.29	pCi/g	
			W-2-US	PB-212	0.45	0.68	pCi/g	
			W-2-US	PB-214	0.83	1.24	pCi/g	
			W-2-US	TL-208	0.34	0.09	pCi/g	
			W-3-OS	GS-137	0.75	0.16	pCi/g	
			W-3-OS	AC-228	1.33	0.33	pCi/g	
			W-3-OS	AM-241	0.01	0.02	pCi/g	
			W-3-OS	BE-7	03.25	10.17	pCi/g	
			W-3-OS	BI-214	0.80	1.19	pCi/g	
			W-3-OS	CO-57	0.68	0.11	pCi/g	
	200032411	300149424	W-3-OS	CO-60	1.16	1.74	pCi/g	
			W-3-OS	K-40	16.59	11.90	pCi/g	
			W-3-OS	MN-54	0.40	0.00	pCi/g	
			W-3-OS	NA-22	0.02	0.04	pCi/g	
			W-3-OS	PA-234M	19.05	7.64	pCi/g	
			W-3-OS	PB-212	3.00	0.37	pCi/g	
			W-3-OS	PB-214	2.46	0.37	pCi/g	
			W-3-OS	TL-208	0.69	0.14	pCi/g	
			W-3-US	GS-137	0.44	0.66	pCi/g	
			W-3-US	AC-228	2.90	0.60	pCi/g	
			W-3-US	AM-241	2.69	0.49	pCi/g	

**** FINAL REPORT ****

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Method Area: EH-GAMMA

Submission Id: 100020922

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
GENERIC GAMMA	200032411	300149424	W-3-US	BE-7	21.75	2.83	pCi/g	
			W-3-US	BI-214	-0.07	0.33	pCi/g	
			W-3-US	CO-57	0.75	0.10	pCi/g	
			W-3-US	CO-60	0.44	0.66	pCi/g	
			W-3-US	K-40	21.88	19.82	pCi/g	
			W-3-US	MN-54	-0.14	0.00	pCi/g	
			W-3-US	NA-22	0.02	0.03	pCi/g	
			W-3-US	PA-234M	78.17	16.73	pCi/g	
			W-3-US	PB-212	1.16	0.22	pCi/g	
			W-3-US	PB-214	0.65	0.98	pCi/g	
			W-3-US	TL-208	0.67	0.43	pCi/g	
			W-4-OS	ES-137	0.40	0.60	pCi/g	
			W-4-OS	AC-228	1.25	0.28	pCi/g	
			W-4-OS	AM-241	2.14	3.24	pCi/g	
			W-4-OS	BE-7	65.01	6.62	pCi/g	
			W-4-OS	BI-214	0.75	0.19	pCi/g	
			W-4-OS	CO-57	0.44	0.00	pCi/g	
			W-4-OS	CO-60	0.59	0.13	pCi/g	
			W-4-OS	K-40	95.09	9.58	pCi/g	
			W-4-OS	MN-54	-0.08	0.00	pCi/g	
			W-4-OS	NA-22	0.03	0.05	pCi/g	
	200032412	300098470 300149425	W-4-OS	PA-234M	13.84	27.00	pCi/g	
			W-4-OS	PB-212	1.30	0.21	pCi/g	
			W-4-OS	PB-214	0.66	0.15	pCi/g	
			W-4-OS	TL-208	0.46	0.11	pCi/g	
			W-4-US	ES-137	0.79	0.18	pCi/g	
			W-4-US	AC-228	2.75	0.55	pCi/g	
	200032413	300098474 300149428	W-4-US					
			W-4-US					

**** FINAL REPORT ****

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06-May-1998 13:10

Method Area: EH-GAMMA

Submission Id: 100020922

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC GAMMA	200032413	300149428	W-4-US	AM-241	4.46	0.68	pCi/g	
			W-4-US	BE-7	47.27	5.39	pCi/g	
			W-4-US	BI-214	1.62	0.29	pCi/g	
			W-4-US	CO-57	0.31	0.00	pCi/g	
			W-4-US	CO-60	0.64	0.15	pCi/g	
			W-4-US	K-40	76.70	16.58	pCi/g	
			W-4-US	MN-54	0.22	0.08	pCi/g	
			W-4-US	NA-22	0.50	0.12	pCi/g	
			W-4-US	PA-234M	18.52	27.00	pCi/g	
			W-4-US	PB-212	0.38	0.10	pCi/g	
			W-4-US	PB-214	2.05	0.35	pCi/g	
			W-4-US	TL-208	0.46	0.10	pCi/g	
			W-5-US	ES-137	0.65	0.14	pCi/g	
			W-5-US	AC-228	3.38	0.58	pCi/g	
			W-5-US	AM-241	0.68	1.02	pCi/g	
			W-5-US	BE-7	58.43	6.35	pCi/g	
			W-5-US	BI-214	0.53	0.16	pCi/g	
			W-5-US	CO-57	0.61	0.00	pCi/g	
			W-5-US	CO-60	1.52	2.27	pCi/g	
			W-5-US	K-40	59.80	23.19	pCi/g	
			W-5-US	MN-54	-0.17	0.00	pCi/g	
			W-5-US	NA-22	0.80	0.18	pCi/g	
			W-5-US	PA-234M	85.42	18.84	pCi/g	
			W-5-US	PB-212	1.30	0.22	pCi/g	
			W-5-US	PB-214	1.49	0.26	pCi/g	
			W-5-US	TL-208	0.92	0.17	pCi/g	
			W-6-US	ES-137	0.16	0.24	pCi/g	
GENERIC GAMMA	200032415	300098482	W-5-US	AM-241	0.68	1.02	pCi/g	
			W-5-US	BE-7	58.43	6.35	pCi/g	

**** FINAL REPORT ****

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Method Area: EH-GAMMA

Submission Id: 100020922

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC GAMMA	200032415	300149430	W-6-US	AC-228	2.31	0.43	pCi/g	
			W-6-US	AM-241	0.85	0.96	pCi/g	
			W-6-US	BE-7	54.85	5.43	pCi/g	
			W-6-US	BI-214	1.03	0.24	pCi/g	
			W-6-US	CO-57	0.53	0.08	pCi/g	
			W-6-US	CO-60	0.60	0.90	pCi/g	
			W-6-US	K-40	56.09	21.05	pCi/g	
			W-6-US	MN-54	0.27	0.07	pCi/g	
			W-6-US	NA-22	0.25	0.10	pCi/g	
			W-6-US	PA-234M	11.84	27.00	pCi/g	
			W-6-US	PB-212	1.13	0.18	pCi/g	
			W-6-US	PB-214	1.76	0.24	pCi/g	
			W-6-US	TL-208	0.76	0.49	pCi/g	
			W-7-US	ES-137	0.05	1.89	pCi/g	
			W-7-US	AC-228	1.63	0.32	pCi/g	
			W-7-US	AM-241	0.53	0.79	pCi/g	
			W-7-US	BE-7	38.69	4.48	pCi/g	
			W-7-US	BI-214	1.35	0.23	pCi/g	
			W-7-US	CO-57	0.31	0.05	pCi/g	
			W-7-US	CO-60	0.21	0.31	pCi/g	
			W-7-US	K-40	79.79	15.83	pCi/g	
			W-7-US	MN-54	-0.08	0.00	pCi/g	
			W-7-US	NA-22	0.51	0.12	pCi/g	
			W-7-US	PA-234M	49.84	11.74	pCi/g	
			W-7-US	PB-212	0.90	1.35	pCi/g	
			W-7-US	PB-214	1.49	0.23	pCi/g	
			W-7-US	TL-208	0.28	0.07	pCi/g	

**** FINAL REPORT ****

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Method Area: EH-GAMMA

Submission Id: 100020922

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
GENERIC GAMMA	200032417	300098490 300149432	W-8-OS	ES-137	0.43	1.80	pCi/g	
			W-8-OS	AC-228	1.16	1.73	pCi/g	
			W-8-OS	AM-241	0.47	0.96	pCi/g	
			W-8-OS	BE-7	72.42	7.46	pCi/g	
			W-8-OS	BI-214	0.79	0.18	pCi/g	
			W-8-OS	CO-57	0.32	0.00	pCi/g	
			W-8-OS	CO-60	0.71	0.14	pCi/g	
			W-8-OS	K-40	94.90	9.61	pCi/g	
			W-8-OS	MN-54	-0.13	0.00	pCi/g	
			W-8-OS	NA-22	0.02	0.04	pCi/g	
			W-8-OS	PA-234M	-8.39	27.00	pCi/g	
			W-8-OS	PB-212	0.84	1.26	pCi/g	
			W-8-OS	PB-214	0.68	0.14	pCi/g	
			W-8-OS	TL-208	0.43	0.27	pCi/g	
			W-8-US	ES-137	0.22	0.32	pCi/g	
			W-8-US	AC-228	1.50	0.30	pCi/g	
			W-8-US	AM-241	0.93	0.23	pCi/g	
			W-8-US	BE-7	29.98	3.36	pCi/g	
			W-8-US	BI-214	0.91	1.37	pCi/g	
			W-8-US	CO-57	0.20	0.00	pCi/g	
			W-8-US	CO-60	0.18	0.27	pCi/g	
			W-8-US	K-40	92.77	16.35	pCi/g	
			W-8-US	MN-54	-0.12	0.00	pCi/g	
			W-8-US	NA-22	0.50	0.12	pCi/g	
			W-8-US	PA-234M	40.63	9.04	pCi/g	
			W-8-US	PB-212	0.42	0.64	pCi/g	
			W-8-US	PB-214	0.52	0.10	pCi/g	

***** FINAL REPORT *****

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Method Area: EH-GAMMA

Submission Id: 100020922

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC GAMMA	200032418	300149433	W-8-US	TL-208	0.40	0.08	pCi/g	
	200032419	300098498	W-9-OS	GS-137	0.62	1.89	pCi/g	
	300149434		W-9-OS	AC-228	1.12	0.24	pCi/g	
			W-9-OS	AM-241	1.41	0.27	pCi/g	
			W-9-OS	BE-7	78.30	7.55	pCi/g	
			W-9-OS	BI-214	0.86	0.16	pCi/g	
			W-9-OS	CO-57	0.15	0.03	pCi/g	
			W-9-OS	CO-60	0.65	0.98	pCi/g	
			W-9-OS	K-40	12.31	10.62	pCi/g	
			W-9-OS	MN-54	0.27	0.00	pCi/g	
			W-9-OS	NA-22	-0.17	0.21	pCi/g	
			W-9-OS	PA-234M	39.28	9.73	pCi/g	
			W-9-OS	PB-212	1.00	0.16	pCi/g	
			W-9-OS	PB-214	0.75	0.18	pCi/g	
			W-9-OS	TL-208	0.32	0.09	pCi/g	
			W-9-US	GS-137	0.58	0.87	pCi/g	
			W-9-US	AC-228	3.67	0.67	pCi/g	
			W-9-US	AM-241	0.36	0.96	pCi/g	
			W-9-US	BE-7	52.37	5.89	pCi/g	
			W-9-US	BI-214	1.44	0.34	pCi/g	
			W-9-US	CO-57	0.90	0.00	pCi/g	
			W-9-US	CO-60	1.54	2.31	pCi/g	
			W-9-US	K-40	07.96	34.31	pCi/g	
			W-9-US	MN-54	0.48	0.13	pCi/g	
			W-9-US	NA-22	0.86	1.29	pCi/g	
			W-9-US	PA-234M	10.86	23.62	pCi/g	
			W-9-US	PB-212	1.05	0.20	pCi/g	

**** FINAL REPORT ****

B-41

Method Area: EH-GAMMA

Submission Id: 100020922

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
GENERIC GAMMA	200032420	300149435	W-9-US W-9-US	PB-214 TL-208	2.21 0.69	0.34 0.16	pCi/g pCi/g	

DUPLICATE TASKS

None run for this submission

SAMPLE SPIKES

None run for this submission

**** FINAL REPORT ****

B-42

Method Area: EH-GAMMA

Submission Id: 100020922

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units pCi/g	Qualifier	QC Value	QC Uncertainty	QC units pCi/g	QC Evaluation
00.36892	300098506	CS-137	10.9	1.0			11.7	.39		UNDER CONTROL

METHOD BLANKS

None run for this submission

OPEN QC

None run for this submission

B-43

***** FINAL REPORT *****

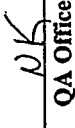
Method Area: EH-GAMMA

Submission Id: 100020922


Analyst


Review


Team Leader


QA Officer

5/5/98
Date

5/5/98
Date

5/5/98
Date

05/07/98
Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level."

**** FINAL REPORT ****

B-44

CUSTOMER INFORMATION

Cost Account:

Name <u>Phil Fresquez</u>	Group <u>ESH-20</u>	Phone <u>7-0815</u>	Mail Stop <u>M887</u>	Program Code <u>M34A 0210 6CAE</u>
---------------------------	---------------------	---------------------	-----------------------	------------------------------------

PROJECT DESCRIPTION

W1-OS 6/16/97	W1-3-US 6/17/97	W1-7-US 6/17/97
W1-US 6/16/97	W1-4-OS 6/17/97	W1-8-OS 6/17/97
W2-OS 6/16/97	W1-4-US 6/17/97	W1-8-US 6/17/97
W2-US 6/16/97	W1-5- US 6/17/97	W1 W1-9-OS 6/17/97
W3-OS 6/17/97	W1-6-US 6/17/97	W1-9-US 6/17/97

SAMPLE RECEIVING INFORMATION

Received By <u>Diana Decker</u>	Date Received <u>7/11/97</u>	Sample Matrix <u>BV</u>	No. of Samples <u>20 15</u>	Samples Received Under Chain-of-Custody? ☒ Yes ☐ No
Samples Checked For ☒ Preservation ☐ Container Integrity ☐ Sample Size ☐ Sample Integrity <u>NONE</u>		Condition of Sample Received ☒ Acceptable ☐ Not Acceptable (Complete an SRD Record)		

REQUESTED ANALYSES

Inorganic	Organics	
		PU-238 PU-239 AM-241 U-234 U-235 U-238 Request No.
Request No.	Request No.	
Comments <u>washed vegetation Area G</u>		
Collection Date: <u>SEE Project Description</u>		
Customer Signature <u>[Signature]</u>		Date <u>7/11/97</u>
Sample Management Custodian Signature <u>Diana Decker</u>		Date <u>7/11/97</u>

A-33
B-45

CHAIN-OF-CUSTODY RECORD

TA-54 AREA - G. all samples
are washed.
(Washed = W)

Los Alamos

Los Alamos National Laboratory

Los Alamos, New Mexico 87545

Soils and Foodstuff (RECEIVED)

P.I.# (505) 667-0815

ESH-20 MS M887

Project Name		Request the following analysis:		Sample Name/Number		Sample Location/Remarks	
Date	Time						
6/16/97	10:30	W	1-OS	1	South #4 shaft field	TA-54 AREA - G. all samples are washed.	
6/16/97	10:30	W	1-US	1	" "		
6/16/97	10:30	W	2-OS	1	West #4 " "		
6/16/97	10:30	W	2-US	1	" " " "		
6/17/97	11:30	W	3-OS	1	E of New Pit.		
6/17/97	11:30	W	3-US	1	" " " "		
6/17/97	9:30	W	4-OS	1	North of Tree Pads 394		
6/17/97	9:30	W	4-US	1	" " " "		
6/17/97	10:30	W	5-US	1	Tree pad #3		
6/17/97	10:30	W	6-US	1	Tree pad #4		
6/17/97	10:50	W	7-US	1	Pits #7 & 24		
6/17/97	12:00	W	8-OS	1	Expansion Area		
6/17/97	12:00	W	8-US	1	" " " "		
6/17/97	1:30	W	9-OS	1	Background (BNP)		
6/17/97	1:30	W	9-US	1	" " " "		
Relinquished by: (signature)		Received by: (signature)		Relinquished by: (signature)		Received by: (signature)	
Date/Time		Date/Time		Date/Time		Date/Time	
7/1/97 2:45		7/1/97 2:45		7/1/97 2:45		7/1/97 2:45	
Relinquished by: (signature)		Received by: (signature)		Relinquished by: (signature)		Received by: (signature)	
Date/Time		Date/Time		Date/Time		Date/Time	
7/1/97 2:45		7/1/97 2:45		7/1/97 2:45		7/1/97 2:45	
Relinquished by: (signature)		Received for Lab. by: (signature)		Date/Time		Remarks:	
7/1/97 2:45		7/1/97 2:45		7/1/97 2:45		7/1/97 2:45	

A-34 B-36

APPENDIX C

CST ANALYTICAL REPORTS OF RADIONUCLIDES IN UNWASHED VEGETATION SAMPLES AT AREA G

C-ii

Los Alamos

NATIONAL LABORATORY

memorandum

Chemical Science and Technology

Responsible Chemistry for America

CST-9/Inorganic Trace Analysis

Los Alamos, New Mexico 87545

To/MS: Philip R. Fresquez/MS 887

From/MS: Claudine Armenta, CST-9/K484

Phone/FAX: 7-3269/5-5982

Symbol: CST-9/98

Date: February 13, 1998

This is a Case Narrative for the following:

Submission Number : 100020928

Analysis : Americium in Biological Samples

I. Introduction

On July 14, 1997 (15) samples were received for analysis.

II. Analytical Results/Methodology

The analytical results are presented as indicated by the terms on the CST-3 Analytical Service Agreement. Each set of data will include sample identification information, the analytical results, and other information as required by ESH-20.

The analysis requested is: Isotopic Americium LA-10300-M, Vol. III, Americium in Environmental Matrices-Alpha Spectrometry, Method ER-121.

III. Quality Control

Laboratory control samples are prepared and analyzed with each sample request.

IV. Comments

Fifteen samples were analyzed for Americium-241. These samples were spiked with Americium-243. Four samples, numbers 200032444, 200032445, 200032446, 200032452, have the following recoveries: 9%, 29%, 15%, 25%, respectively. We try to maintain standard percent recovery of 30%. I feel that the low recovery had no effect on the data, we used such a large aliquote size to increase the sensitivity, that there was a problem with the matrix causing the low recoveries. Our Q.C. sample number 200032464 recovered 48% and fell Under Control. There is no activity in the Americium-241 area that I felt it appropriate to proceed in reporting the data. A portion of sample is available for possible re-run.

I verify, to the best of my knowledge, that the listed results are and both complete and technically correct, with the exception of the items detailed above.


Claudine E. Armenta 2/19/98

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C-1

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method Area: EH-ALPHA

Submission Id : 100020928

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	M34A02106CA3	Due Date:	11-SEP-97
Requester Group:	ESH-20	Logged Date:	14-JUL-97	Screening Data:	NO SCREENING DATA REQUIRED
Mail Stop:	M887	Study:	ESH20 BIOLOGICALS	Logged by:	LBRANCH
Requester Phone:	667-0815	Analytical Service Agreement #:			
Requester Fax #:	667-0731				

CUSTOMER SAMPLES

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
AM RAS ENV	200032427	300098552	UNW-1-OS	Am-241	0.0190	0.0017	pCi/g	
			UNW-1-OS	Am-243T Spike	1.95		pCi	
			UNW-1-OS	Am-243T Recovery	77.95		%	
			UNW-1-OS	Am-243T Recovered	1.52		pCi	
			UNW-1-OS	Am-241 Gross Counts	166		counts	
			UNW-1-OS	Am-241 Background Counts	6.8		counts	
			UNW-1-OS	Efficiency	31.70		%	
			UNW-1-OS	Count Time	3000.00		min	
			UNW-1-OS	Analysis Date	02/09/98		MM/DD/YY	
			UNW-1-OS	Instrument	ALPHA 32		NONE	
	200032442	300098556	UNW-1-US	Am-241	0.0069	0.0012	pCi/g	
			UNW-1-US	Am-243T Spike	1.95		pCi	
			UNW-1-US	Am-243T Recovery	61.32		%	
			UNW-1-US	Am-243T Recovered	1.2		pCi	
			UNW-1-US	Am-241 Gross Counts	65		counts	
			UNW-1-US	Am-241 Background Counts	15.0		counts	
			UNW-1-US	Efficiency	29.56		%	
			UNW-1-US	Count Time	3000.00		min	
			UNW-1-US	Analysis Date	02/09/98		MM/DD/YY	

**** FINAL REPORT ****

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Method Area: EH-ALPHA

Submission Id : 100020928

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
AM RAS ENV	200032442	300098556	UNW-1-US	Instrument	ALPHA 32		NONE	
	200032443	300098560	UNW-2-US	Am-241	0.0313	0.0026	pCi/g	
			UNW-2-US	Am-243T Spike	1.95		pCi	
			UNW-2-US	Am-243T Recovery	72.92		%	
			UNW-2-US	Am-243T Recovered	1.42		pCi	
			UNW-2-US	Am-241 Gross Counts	184		counts	
			UNW-2-US	Am-241 Background Counts	5.4		counts	
			UNW-2-US	Efficiency	30.10		%	
			UNW-2-US	Count Time	3000.00		min	
			UNW-2-US	Analysis Date	02/09/98		MM/DD/YY	
			UNW-2-US	Instrument	ALPHA 32		NONE	
	200032444	300098564	UNW-2-US	Am-241	0.0152	0.0042	pCi/g	
			UNW-2-US	Am-243T Spike	1.95		pCi	
			UNW-2-US	Am-243T Recovery	9.34		%	
			UNW-2-US	Am-243T Recovered	0.18		pCi	
			UNW-2-US	Am-241 Gross Counts	17		counts	
			UNW-2-US	Am-241 Background Counts	1.6		counts	
			UNW-2-US	Efficiency	30.56		%	
			UNW-2-US	Count Time	3000.00		min	
			UNW-2-US	Analysis Date	02/09/98		MM/DD/YY	
			UNW-2-US	Instrument	ALPHA 32		NONE	
	200032445	300098568	UNW-3-US	Am-241	0.5814	0.0306	pCi/g	
			UNW-3-US	Am-243T Spike	1.95		pCi	
			UNW-3-US	Am-243T Recovery	28.56		%	
			UNW-3-US	Am-243T Recovered	0.56		pCi	
			UNW-3-US	Am-241 Gross Counts	1071		counts	
			UNW-3-US	Am-241 Background Counts	4.4		counts	

**** FINAL REPORT ****

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Method Area: EH-ALPHA

Submission Id : 100020928

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
AM RAS ENV	200032445	300098568	UNW-3-OS	Efficiency	32.36		%	
			UNW-3-OS	Count Time	3000.00		min	
			UNW-3-OS	Analysis Date	02/09/98		MM/DD/YY	
			UNW-3-OS	Instrument	ALPHA 32		NONE	
	200032446	300098571	UNW-3-US	Am-241	0.0150	0.0033	pCi/g	
			UNW-3-US	Am-243T Spike	1.95		pCi	
			UNW-3-US	Am-243T Recovery	14.91		%	
			UNW-3-US	Am-243T Recovered	0.29		pCi	
			UNW-3-US	Am-241 Gross Counts	31		counts	
			UNW-3-US	Am-241 Background Counts	4.2		counts	
			UNW-3-US	Efficiency	30.64		%	
			UNW-3-US	Count Time	3000.00		min	
			UNW-3-US	Analysis Date	02/09/98		MM/DD/YY	
			UNW-3-US	Instrument	ALPHA 32		NONE	
	200032447	300098576	UNW-4-OS	Am-241	0.1096	0.0058	pCi/g	
			UNW-4-OS	Am-243T Spike	1.95		pCi	
			UNW-4-OS	Am-243T Recovery	68.17		%	
			UNW-4-OS	Am-243T Recovered	1.33		pCi	
			UNW-4-OS	Am-241 Gross Counts	701		counts	
			UNW-4-OS	Am-241 Background Counts	7.8		counts	
			UNW-4-OS	Efficiency	30.81		%	
			UNW-4-OS	Count Time	3000.00		min	
			UNW-4-OS	Analysis Date	02/09/98		MM/DD/YY	
			UNW-4-OS	Instrument	ALPHA 32		NONE	
	200032448	300098580	UNW-4-US	Am-241	0.0630	0.0039	pCi/g	
			UNW-4-US	Am-243T Spike	1.95		pCi	
			UNW-4-US	Am-243T Recovery	72.29		%	

**** FINAL REPORT ****

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Method Area: EH-ALPHA

Submission Id : 100020928

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
AM RAS ENV	200032448	300098580	UNW-4-US	Am-243T Recovered	1.41		pCi	
			UNW-4-US	Am-241 Gross Counts	406		counts	
			UNW-4-US	Am-241 Background Counts	8.0		counts	
			UNW-4-US	Efficiency	31.19		%	
			UNW-4-US	Count Time	3000.00		min	
			UNW-4-US	Analysis Date	02/09/98		MM/DD/YY	
			UNW-4-US	Instrument	ALPHA 32		NONE	
			UNW-5-US	Am-241	0.0895	0.0055	pCi/g	
			UNW-5-US	Am-243T Spike	1.95		pCi	
			UNW-5-US	Am-243T Recovery	52.52		%	
	200032449	300098584	UNW-5-US	Am-243T Recovered	1.02		pCi	
			UNW-5-US	Am-241 Gross Counts	448		counts	
			UNW-5-US	Am-241 Background Counts	4.8		counts	
			UNW-5-US	Efficiency	29.18		%	
			UNW-5-US	Count Time	3000.00		min	
			UNW-5-US	Analysis Date	02/09/98		MM/DD/YY	
			UNW-5-US	Instrument	ALPHA 32		NONE	
			UNW-6-US	Am-241	0.1565	0.0079	pCi/g	
			UNW-6-US	Am-243T Spike	1.95		pCi	
			UNW-6-US	Am-243T Recovery	55.31		%	
	200032450	300098588	UNW-6-US	Am-243T Recovered	1.08		pCi	
			UNW-6-US	Am-241 Gross Counts	904		counts	
			UNW-6-US	Am-241 Background Counts	6.4		counts	
			UNW-6-US	Efficiency	31.02		%	
			UNW-6-US	Count Time	3000.00		min	
			UNW-6-US	Analysis Date	02/09/98		MM/DD/YY	
			UNW-6-US	Instrument	ALPHA 32		NONE	

**** FINAL REPORT ****

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Method Area: EH-ALPHA

Submission Id: 100020928

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
AM RAS ENV	200032451	300098592	UNW-7-US	Am-241	0.1083	0.0054	pCi/g	
			UNW-7-US	Am-243T Spike	1.95		pCi	
			UNW-7-US	Am-243T Recovery	75.38		%	
			UNW-7-US	Am-243T Recovered	1.47		pCi	
			UNW-7-US	Am-241 Gross Counts	934		counts	
			UNW-7-US	Am-241 Background Counts	4.8		counts	
			UNW-7-US	Efficiency	27.80		%	
			UNW-7-US	Count Time	3000.00		min	
			UNW-7-US	Analysis Date	02/09/98		MM/DD/YY	
			UNW-7-US	Instrument	ALPHA 32		NONE	
	200032452	300098596	UNW-8-OS	Am-241	0.0147	0.0026	pCi/g	
			UNW-8-OS	Am-243T Spike	1.95		pCi	
			UNW-8-OS	Am-243T Recovery	25.37		%	
			UNW-8-OS	Am-243T Recovered	0.49		pCi	
			UNW-8-OS	Am-241 Gross Counts	40		counts	
			UNW-8-OS	Am-241 Background Counts	3.2		counts	
			UNW-8-OS	Efficiency	33.31		%	
			UNW-8-OS	Count Time	3000.00		min	
			UNW-8-OS	Analysis Date	02/09/98		MM/DD/YY	
			UNW-8-OS	Instrument	ALPHA 32		NONE	
	200032453	300098600	UNW-9-US	Am-241	0.0024	0.0006	pCi/g	
			UNW-9-US	Am-243T Spike	1.95		pCi	
			UNW-9-US	Am-243T Recovery	69.89		%	
			UNW-9-US	Am-243T Recovered	1.36		pCi	
			UNW-9-US	Am-241 Gross Counts	28		counts	
			UNW-9-US	Am-241 Background Counts	7.2		counts	
			UNW-9-US	Efficiency	31.05		%	

**** FINAL REPORT ****

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C-6

Method Area: EH-ALPHA

Submission Id : 100020928

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
AM RAS ENV	200032453	300098600	UNW-9-US	Count Time	3000.00		min	
			UNW-9-US	Analysis Date	02/09/98		MM/DD/YY	
			UNW-9-US	Instrument	ALPHA 32		NONE	
	200032454	300098604	UNW-8-US	Am-241	0.0084	0.0012	pCi/g	
			UNW-8-US	Am-243T Spike	1.95		pCi	
			UNW-8-US	Am-243T Recovery	65.00		%	
			UNW-8-US	Am-243T Recovered	1.27		pCi	
			UNW-8-US	Am-241 Gross Counts	64		counts	
			UNW-8-US	Am-241 Background Counts	5.4		counts	
			UNW-8-US	Efficiency	31.90		%	
			UNW-8-US	Count Time	3000.00		min	
			UNW-8-US	Analysis Date	02/09/98		MM/DD/YY	
	200032455	300098608	UNW-8-US	Instrument	ALPHA 32		NONE	
			UNW-9-OS	Am-241	0.0108	0.0015	pCi/g	
			UNW-9-OS	Am-243T Spike	1.95		pCi	
			UNW-9-OS	Am-243T Recovery	68.37		%	
			UNW-9-OS	Am-243T Recovered	1.33		pCi	
			UNW-9-OS	Am-241 Gross Counts	70		counts	
			UNW-9-OS	Am-241 Background Counts	5.6		counts	
			UNW-9-OS	Efficiency	32.56		%	
			UNW-9-OS	Count Time	3000.00		min	
			UNW-9-OS	Analysis Date	02/09/98		MM/DD/YY	
			UNW-9-OS	Instrument	ALPHA 32		NONE	

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DUPLICATE TASKS

None run for this submission

**** FINAL REPORT ****

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13-Feb-1998 16:12

Page 7 of 9

Method Area: EH-ALPHA

Submission Id : 100020928

SAMPLE SPIKES

None run for this submission

C-8

**** FINAL REPORT ****

18 4/38

Method Area: EH-ALPHA

Submission Id : 100020928

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units pCi/g	Qualifier	QC Value	QC Uncertainty	QC units pCi/g	QC Evaluation UNDER CONTROL
00.36194	300134423	Am-241	6.6379	0.2919	pCi/g		6.7	.3		

METHOD BLANKS

None run for this submission

OPEN QC

None run for this submission

C-9

***** FINAL REPORT *****

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Method Area: EH-ALPHA

Submission Id : 100020928

LA/A
AnalystSTG
ReviewCS
Team LeaderDR for mAG
QA Officer2/17/98
Date2/19/98
Date2/19/98
Date2/21/98
Date

C-10

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level."

**** FINAL REPORT ****

20 of 38

Los Alamos
NATIONAL LABORATORY
memorandum

Chemical Science & Technology
Inorganic Trace Analysis, CST-9
MS K484
Los Alamos, New Mexico 87545
(505) 667-3269
FAX (505) 665-6561

To/MS: Phillip R. Fresquez, MS M887
From/MS: S. R. Garcia, CST-9, MS K484
Phone/FAX: 5-0270/5-5982 *S. Garcia*
Symbol: CST-9-PRF-97-11
Date: September 10, 1997

SUBJECT: SUBMISSION 100020928 ¹³⁷Cs RESULTS IN VEGETATION ASH

Please be advised that the ¹³⁷Cs results for submission id 100020928 have been reported and entered into the LIMS database. Both open and blind QC's were *in control*. As with most vegetation ash samples, there was not sufficient sample to generate a duplicate. There were no obvious anomalously high ¹³⁷Cs values.

Should you have any questions concerning this request number, please feel free to call or send an e-mail message to me at....sgarcia@lims1.lanl.gov.

C-11

Method Area: EH-GAMMA

Submission Id: 100020928

Requester Name: PHIL FRESQUEZ
Requester Group: ESH-20
Mail Stop: M887
Requester Phone: 667-0815
Requester Fax #: 667-0731

Customer Cost Code: M34A02106CA3
Logged Date: 14-JUL-97
Due Date: 11-SEP-97
Screening Data: NO SCREENING DATA REQUIRED

Logged by: LBRANCH
Analytical Service Agreement #:

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC GAMMA	200032427	300098550	UNW-1-OS	Cs-137	0.29	0.43	pCi/g	
	200032442	300098554	UNW-1-US	Cs-137	0.33	0.49	pCi/g	
	200032443	300098558	UNW-2-OS	Cs-137	0.18	0.27	pCi/g	
	200032444	300098562	UNW-2-US	Cs-137	0.23	0.34	pCi/g	
	200032445	300098566	UNW-3-OS	Cs-137	0.39	0.59	pCi/g	
	200032446	300098573	UNW-3-US	Cs-137	0.28	0.42	pCi/g	
	200032447	300098574	UNW-4-OS	Cs-137	0.06	0.09	pCi/g	
	200032448	300098578	UNW-4-US	Cs-137	0.11	0.16	pCi/g	
	200032449	300098582	UNW-5-US	Cs-137	-0.00	1.80	pCi/g	
	200032450	300098586	UNW-6-US	Cs-137	-0.03	1.80	pCi/g	
	200032451	300098590	UNW-7-US	Cs-137	0.11	0.17	pCi/g	
	200032452	300098594	UNW-8-OS	Cs-137	0.24	0.36	pCi/g	
	200032453	300098598	UNW-9-US	Cs-137	0.37	0.08	pCi/g	
	200032454	300098602	UNW-8-US	Cs-137	-0.03	1.80	pCi/g	
	200032455	300098606	UNW-9-OS	Cs-137	0.34	0.50	pCi/g	

DUPLICATE TASKS

None run for this submission

***** FINAL REPORT *****

Method Area: EH-GAMMA

Submission Id : 100020928

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units pCi/g	Qualifier	QC Value	QC Uncertainty	QC units pCi/g	QC Evaluation
00.36893	300098610	Cs-137	47.5	3.3	pCi/g		46.8	1.54		UNDER CONTROL

METHOD BLANKS

Customer Id	Task Id	Component	Result Value	Uncertainty	Units pCi/g	Qualifier	QC Value	QC Uncertainty	QC units pCi/g	QC Evaluation
00.22784	300111173	Cs-137	0.02	0.03	pCi/g		0	0		UNDER CONTROL

OPEN QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units pCi/g	Qualifier	QC Value	QC Uncertainty	QC units pCi/g	QC Evaluation
00.33742	300111174	Cs-137	33.8	2.4	pCi/g		30	1		UNDER CONTROL
00.33376	300111175	Cs-137	4.52	0.36	pCi/g		5.0400	0.1700		UNDER CONTROL

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***** FINAL REPORT *****

Method Area: EH-GAMMA

Submission Id : 100020928



Analyst



Review



Team Leader



QA Officer

9/10/97

Date

9/10/97

Date

9/10/97

Date

9/10/97

Date

C-14

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level."

**** FINAL REPORT ****

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method Area: EH-ALPHA

Submission ID: 100020928

Requester Name: PHIL FRESQUEZ
Requester Group: ESH-20
Mail Stop: M887
Requester Phone: 667-0815
Requester Fax #: 667-0731

Customer Cost Code: M34A02106CA3
Logged Date: 14-JUL-97

Study: ESH20 BIOLOGICALS

Analytical Service Agreement #:

Due Date: 11-SEP-97
Screening Data: NO SCREENING DATA REQUIRED

Logged by: LBRANCH

CUSTOMER SAMPLES

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
U RAS ENV	200032427	300098553	UNW-1-OS	U-234	0.2982	0.0166	pCi/g	
			UNW-1-OS	U-235	0.0141	0.0023	pCi/g	
			UNW-1-OS	U-238	0.3349	0.0182	pCi/g	
			UNW-1-OS	U-234 Gross Counts	870		counts	
			UNW-1-OS	U-234 Background Counts	5.4		counts	
			UNW-1-OS	U-235 Gross Counts	41		counts	
			UNW-1-OS	U-235 Background Counts	0.2		counts	
			UNW-1-OS	U-238 Gross Counts	972		counts	
			UNW-1-OS	U-238 Background Counts	0.8		counts	
			UNW-1-OS	U-232T Spike	1.56		pCi	
			UNW-1-OS	U-232T Recovery	83.21		%	
			UNW-1-OS	Efficiency	23.13		%	
			UNW-1-OS	Count Time	1333.33		min	
			UNW-1-OS	Analysis Date	1/13/98		MM/DD/YY	
			UNW-1-OS	Instrument	ALPHA 112		NONE	
	200032442	300098557	UNW-1-US	U-234	0.1794	0.0106	pCi/g	
			UNW-1-US	U-235	0.0055	0.0013	pCi/g	
			UNW-1-US	U-238	0.1520	0.0094	pCi/g	
			UNW-1-US	U-234 Gross Counts	631		counts	

***** FINAL REPORT *****

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C-15

Method Area: EH-ALPHA

Submission Id: 100020928

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
U RAS ENV	200032442	300098557	UNW-1-US	U-234 Background Counts	3.0		counts	
			UNW-1-US	U-235 Gross Counts	21		counts	
			UNW-1-US	U-235 Background Counts	1.6		counts	
			UNW-1-US	U-238 Gross Counts	534		counts	
			UNW-1-US	U-238 Background Counts	1.8		counts	
			UNW-1-US	U-232T Spike	1.56		pCi	
			UNW-1-US	U-232T Recovery	87.43		%	
			UNW-1-US	Efficiency	22.48		%	
			UNW-1-US	Count Time	1333.33		min	
			UNW-1-US	Analysis Date	1/13/98		MM/DD/YY	
			UNW-1-US	Instrument	ALPHA 112		NONE	
		300098561	UNW-2-OS	U-234	0.3157	0.0187	pCi/g	
			UNW-2-OS	U-235	0.0158	0.0029	pCi/g	
			UNW-2-OS	U-238	0.3589	0.0207	pCi/g	
			UNW-2-OS	U-234 Gross Counts	671		counts	
			UNW-2-OS	U-234 Background Counts	3.2		counts	
			UNW-2-OS	U-235 Gross Counts	35		counts	
	200032443		UNW-2-OS	U-235 Background Counts	1.6		counts	
			UNW-2-OS	U-238 Gross Counts	761		counts	
			UNW-2-OS	U-238 Background Counts	1.8		counts	
			UNW-2-OS	U-232T Spike	1.56		pCi	
			UNW-2-OS	U-232T Recovery	81.45		%	
			UNW-2-OS	Efficiency	22.49		%	
			UNW-2-OS	Count Time	1333.33		min	
			UNW-2-OS	Analysis Date	1/13/98		MM/DD/YY	
U RAS ENV	200032444	300098565	UNW-2-OS	Instrument	ALPHA 112		NONE	
			UNW-2-US	U-234	0.2168	0.0128	pCi/g	

**** FINAL REPORT ****

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C-16

Method Area: EH-ALPHA

Submission ID: 100020928

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
U RAS ENV	200032444	300098565	UNW-2-US	U-235	0.0101	0.0019	pCi/g	
			UNW-2-US	U-238	0.2158	0.0127	pCi/g	
			UNW-2-US	U-234 Gross Counts	658		counts	
			UNW-2-US	U-234 Background Counts	4.2		counts	
			UNW-2-US	U-235 Gross Counts	32		counts	
			UNW-2-US	U-235 Background Counts	1.4		counts	
			UNW-2-US	U-238 Gross Counts	653		counts	
			UNW-2-US	U-238 Background Counts	2.4		counts	
			UNW-2-US	U-232T Spike	1.56		pCi	
			UNW-2-US	U-232T Recovery	79.57		%	
	200032445	300098569	UNW-2-US	Efficiency	24.02		%	
			UNW-2-US	Count Time	1333.33		min	
			UNW-2-US	Analysis Date	1/13/98		MM/DD/YY	
			UNW-2-US	Instrument	ALPHA 112		NONE	
			UNW-3-OS	U-234	1.1688	0.0592	pCi/g	
			UNW-3-OS	U-235	0.0409	0.0054	pCi/g	
			UNW-3-OS	U-238	1.0388	0.0533	pCi/g	
			UNW-3-OS	U-234 Gross Counts	1859		counts	
			UNW-3-OS	U-234 Background Counts	5.4		counts	
			UNW-3-OS	U-235 Gross Counts	66		counts	
			UNW-3-OS	U-235 Background Counts	1.2		counts	
			UNW-3-OS	U-238 Gross Counts	1650		counts	
			UNW-3-OS	U-238 Background Counts	2.6		counts	
			UNW-3-OS	U-232T Spike	1.56		pCi	
			UNW-3-OS	U-232T Recovery	74.50		%	
			UNW-3-OS	Efficiency	24.13		%	
			UNW-3-OS	Count Time	1333.33		min	

**** FINAL REPORT ****

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C-17

Method Area: EH-ALPHA

Submission Id: 100020928

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
U RAS ENV	200032445	300098569	UNW-3-OS	Analysis Date	1/13/98		MM/DD/YY	
			UNW-3-OS	Instrument	ALPHA 112		NONE	
	200032446	300098572	UNW-3-US	U-234	0.2505	0.0135	pCi/g	
			UNW-3-US	U-235	0.0078	0.0015	pCi/g	
			UNW-3-US	U-238	0.2402	0.0131	pCi/g	
			UNW-3-US	U-234 Gross Counts	930		counts	
			UNW-3-US	U-234 Background Counts	3.6		counts	
			UNW-3-US	U-235 Gross Counts	30		counts	
			UNW-3-US	U-235 Background Counts	1.0		counts	
			UNW-3-US	U-238 Gross Counts	891		counts	
			UNW-3-US	U-238 Background Counts	2.8		counts	
			UNW-3-US	U-232T Spike	1.56		pCi	
			UNW-3-US	U-232T Recovery	95.32		%	
			UNW-3-US	Efficiency	22.29		%	
			UNW-3-US	Count Time	1333.33		min	
			UNW-3-US	Analysis Date	1/13/98		MM/DD/YY	
			UNW-3-US	Instrument	ALPHA 112		NONE	
	200032447	300098577	UNW-4-OS	U-234	0.3463	0.0202	pCi/g	
			UNW-4-OS	U-235	0.0161	0.0028	pCi/g	
			UNW-4-OS	U-238	0.3513	0.0204	pCi/g	
			UNW-4-OS	U-234 Gross Counts	788		counts	
			UNW-4-OS	U-234 Background Counts	7.2		counts	
			UNW-4-OS	U-235 Gross Counts	38		counts	
			UNW-4-OS	U-235 Background Counts	1.6		counts	
			UNW-4-OS	U-238 Gross Counts	795		counts	
			UNW-4-OS	U-238 Background Counts	3.0		counts	
			UNW-4-OS	U-232T Spike	1.56		pCi	

**** FINAL REPORT ****

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C-18

Method Area: EH-ALPHA

Submission Id : 100020928

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
U RAS ENV	200032447	300098577	UNW-4-OS	U-232T Recovery	74.61		%	
			UNW-4-OS	Efficiency	22.58		%	
			UNW-4-OS	Count Time	1333.33		min	
			UNW-4-OS	Analysis Date	1/13/98		MM/DD/YY	
	200032448	300098581	UNW-4-OS	Instrument	ALPHA 112		NONE	
			UNW-4-US	U-234	0.2688	0.0157	pCi/g	
			UNW-4-US	U-235	0.0110	0.0022	pCi/g	
			UNW-4-US	U-238	0.2581	0.0152	pCi/g	
			UNW-4-US	U-234 Gross Counts	677		counts	
			UNW-4-US	U-234 Background Counts	7.0		counts	
			UNW-4-US	U-235 Gross Counts	28		counts	
			UNW-4-US	U-235 Background Counts	0.6		counts	
			UNW-4-US	U-238 Gross Counts	645		counts	
			UNW-4-US	U-238 Background Counts	1.6		counts	
			UNW-4-US	U-232T Spike	1.56		pCi	
			UNW-4-US	U-232T Recovery	83.94		%	
			UNW-4-US	Efficiency	23.83		%	
			UNW-4-US	Count Time	1333.33		min	
	200032449	300098585	UNW-4-US	Analysis Date	1/13/98		MM/DD/YY	
			UNW-4-US	Instrument	ALPHA 112		NONE	
			UNW-5-US	U-234	0.3294	0.0180	pCi/g	
			UNW-5-US	U-235	0.0116	0.0022	pCi/g	
			UNW-5-US	U-238	0.3253	0.0178	pCi/g	
			UNW-5-US	U-234 Gross Counts	941		counts	
			UNW-5-US	U-234 Background Counts	6.4		counts	
			UNW-5-US	U-235 Gross Counts	35		counts	
			UNW-5-US	U-235 Background Counts	2.2		counts	

**** FINAL REPORT ****

11 01 47

C-19

Submission Id : 100020928

FINAL REPORT

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C. 20

Method Area: EH-ALPHA

Submission ID: 100020928

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
U RAS ENV	200032451	300098593	UNW-7-US	U-234 Background Counts	6.6		counts	
			UNW-7-US	U-235 Gross Counts	31		counts	
			UNW-7-US	U-235 Background Counts	1.4		counts	
			UNW-7-US	U-238 Gross Counts	703		counts	
			UNW-7-US	U-238 Background Counts	2.2		counts	
			UNW-7-US	U-232T Spike	1.56		pCi	
			UNW-7-US	U-232T Recovery	85.28		%	
			UNW-7-US	Efficiency	21.16		%	
			UNW-7-US	Count Time	1333.33		min	
			UNW-7-US	Analysis Date	1/13/98		MM/DD/YY	
	200032452	300098597	UNW-7-US	Instrument	ALPHA 112		NONE	
			UNW-8-OS	U-234	0.2125	0.0131	pCi/g	
			UNW-8-OS	U-235	0.0076	0.0019	pCi/g	
			UNW-8-OS	U-238	0.2627	0.0154	pCi/g	
			UNW-8-OS	U-234 Gross Counts	540		counts	
			UNW-8-OS	U-234 Background Counts	2.8		counts	
			UNW-8-OS	U-235 Gross Counts	21		counts	
			UNW-8-OS	U-235 Background Counts	1.8		counts	
			UNW-8-OS	U-238 Gross Counts	667		counts	
			UNW-8-OS	U-238 Background Counts	2.8		counts	
	200032453	300098601	UNW-8-OS	U-232T Spike	1.56		pCi	
			UNW-8-OS	U-232T Recovery	81.32		%	
			UNW-8-OS	Efficiency	23.60		%	
			UNW-8-OS	Count Time	1333.33		min	
			UNW-8-OS	Analysis Date	1/13/98		MM/DD/YY	
			UNW-8-OS	Instrument	ALPHA 112		NONE	
			UNW-9-US	U-234	0.1468	0.0088	pCi/g	

***** FINAL REPORT *****

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C-21

Method Area: EH-ALPHA

Submission Id: 100020928

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
U RAS ENV	200032453	300098601	UNW-9-US	U-235	0.0053	0.0012	pCi/g	
			UNW-9-US	U-238	0.1606	0.0094	pCi/g	
			UNW-9-US	U-234 Gross Counts	574		counts	
			UNW-9-US	U-234 Background Counts	4.2		counts	
			UNW-9-US	U-235 Gross Counts	21		counts	
			UNW-9-US	U-235 Background Counts	0.6		counts	
			UNW-9-US	U-238 Gross Counts	625		counts	
			UNW-9-US	U-238 Background Counts	1.8		counts	
			UNW-9-US	U-232T Spike	1.56		pCi	
			UNW-9-US	U-232T Recovery	97.51		%	
	200032454	300098605	UNW-9-US	Efficiency	22.22		%	
			UNW-9-US	Count Time	1333.33		min	
			UNW-9-US	Analysis Date	1/13/98		MM/DD/YY	
			UNW-9-US	Instrument	ALPHA 112		NONE	
			UNW-8-US	U-234	0.1376	0.0092	pCi/g	
			UNW-8-US	U-235	0.0038	0.0012	pCi/g	
			UNW-8-US	U-238	0.1428	0.0094	pCi/g	
			UNW-8-US	U-234 Gross Counts	401		counts	
			UNW-8-US	U-234 Background Counts	4.2		counts	
			UNW-8-US	U-235 Gross Counts	12		counts	
			UNW-8-US	U-235 Background Counts	1.0		counts	
			UNW-8-US	U-238 Gross Counts	415		counts	
			UNW-8-US	U-238 Background Counts	3.2		counts	
			UNW-8-US	U-232T Spike	1.56		pCi	
			UNW-8-US	U-232T Recovery	87.25		%	
			UNW-8-US	Efficiency	22.11		%	
			UNW-8-US	Count Time	1333.33		min	

**** FINAL REPORT ****

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C-22

16-Jan-1998 11:01

Method Area: EH-ALPHA

Submission Id: 100020928

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
U RAS ENV	200032454	300098605	UNW-8-US	Analysis Date	1/13/98		MM/DD/YY	
			UNW-8-US	Instrument	ALPHA 112		NONE	
	200032455	300098609	UNW-9-OS	U-234	0.1281	0.0103	pCi/g	
			UNW-9-OS	U-235	0.0047	0.0017	pCi/g	
			UNW-9-OS	U-238	0.1593	0.0119	pCi/g	
			UNW-9-OS	U-234 Gross Counts	243		counts	
			UNW-9-OS	U-234 Background Counts	4.0		counts	
			UNW-9-OS	U-235 Gross Counts	10		counts	
			UNW-9-OS	U-235 Background Counts	1.2		counts	
			UNW-9-OS	U-238 Gross Counts	299		counts	
			UNW-9-OS	U-238 Background Counts	1.8		counts	
			UNW-9-OS	U-232T Spike	1.56		pCi	
			UNW-9-OS	U-232T Recovery	82.50		%	
			UNW-9-OS	Efficiency	19.00		%	
			UNW-9-OS	Count Time	1333.33		min	
			UNW-9-OS	Analysis Date	1/13/98		MM/DD/YY	
			UNW-9-OS	Instrument	ALPHA 112		NONE	

DUPLICATE TASKS

None run for this submission

SAMPLE SPIKES

None run for this submission

**** FINAL REPORT ****

15 0142

C-23

Method Area: EH-ALPHA

Submission Id: 100020928

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	Qualifier	QC Value	QC Uncertainty	QC units	QC Evaluation
00.34909	300098612	U-234	1.3434	0.0801	pCi/g		1.24	0.124	pCi/g	UNDER CONTROL
		U-235	0.0393	0.0094	pCi/g		0.059	0.0059	pCi/g	UNDER CONTROL
		U-238	1.4209	0.0837	pCi/g		1.24	0.124	pCi/g	UNDER CONTROL

METHOD BLANKS

None run for this submission

OPEN QC

None run for this submission

C-24

**** FINAL REPORT ****

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Method Area: EH-ALPHA

Submission Id: 100020928

LEE A
Analyst

E. J.
Review

BZ
Team Leader

DP for MAC
QA Officer

1/16/98
Date

1-23-98
Date

1/23/98
Date

1/25/98
Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level."

**** FINAL REPORT ****

17-0142

3 C-25

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method Area: **EH-ALPHA**Submission Id: **100020928**

Requester Name: PHIL FRESQUEZ	Customer Cost Code: M34A02106CA3	Due Date: 11-SEP-97	Screening Data: NO SCREENING DATA REQUIRED
Requester Group: ESH-20	Logged Date: 14-JUL-97		
Mail Stop: M887	Study: ESH20 BIOLOGICALS		
Requester Phone: 667-0815	Logged by: LBRANCH		
Requester Fax #: 667-0731	Analytical Service Agreement #:		

CUSTOMER SAMPLES

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
PU RAS ENV	200032427	300098551	UNW-1-OS	Pu-238	0.0017	0.0005	pCi/g	
			UNW-1-OS	Pu-239	0.0230	0.0018	pCi/g	
			UNW-1-OS	Pu-242T Spike	1.95		pCi	
			UNW-1-OS	Pu-242T Recovery	85.33		%	
			UNW-1-OS	Pu-242T Recovered	1.66		pCi	
			UNW-1-OS	Pu-238 Gross Counts	22		counts	
			UNW-1-OS	Pu-238 Background Counts	6.8		counts	
			UNW-1-OS	Pu-239 Gross Counts	219		counts	
			UNW-1-OS	Pu-239 Background Counts	8.2		counts	
			UNW-1-OS	Efficiency	31.70		%	
			UNW-1-OS	Count Time	3000.00		min	
			UNW-1-OS	Analysis Date	1/30/98		MM/DD/YY	
			UNW-1-OS	Instrument	ALPHA 32		NONE	
			UNW-1-US	Pu-238	0.0015	0.0008	pCi/g	
			UNW-1-US	Pu-239	0.0281	0.0022	pCi/g	
	200032442	300098555	UNW-1-US	Pu-242T Spike	1.95		pCi	
			UNW-1-US	Pu-242T Recovery	62.46		%	
			UNW-1-US	Pu-242T Recovered	1.22		pCi	
			UNW-1-US	Pu-238 Gross Counts	26		counts	

**** FINAL REPORT ****

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Method Area: EH-ALPHA

Submission Id: 100020928

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
PU-RAS ENV	200032442	300098555	UNW-1-US	Pu-238 Background Counts	15.0		counts	
			UNW-1-US	Pu-239 Gross Counts	216		counts	
			UNW-1-US	Pu-239 Background Counts	8.0		counts	
			UNW-1-US	Efficiency	29.56		%	
			UNW-1-US	Count Time	3000.00		min	
			UNW-1-US	Analysis Date	1/30/98		MM/DD/YY	
			UNW-1-US	Instrument	ALPHA 32		NONE	
			UNW-2-OS	Pu-238	0.0037	0.0009	pCi/g	
			UNW-2-OS	Pu-239	0.0330	0.0026	pCi/g	
			UNW-2-OS	Pu-242T Spike	1.95		pCi	
	200032443	300098559	UNW-2-OS	Pu-242T Recovery	76.43		%	
			UNW-2-OS	Pu-242T Recovered	1.49		pCi	
			UNW-2-OS	Pu-238 Gross Counts	27		counts	
			UNW-2-OS	Pu-238 Background Counts	4.8		counts	
			UNW-2-OS	Pu-239 Gross Counts	201		counts	
			UNW-2-OS	Pu-239 Background Counts	3.6		counts	
			UNW-2-OS	Efficiency	30.10		%	
			UNW-2-OS	Count Time	3000.00		min	
			UNW-2-OS	Analysis Date	1/30/98		MM/DD/YY	
			UNW-2-OS	Instrument	ALPHA 32		NONE	
	200032444	300098563	UNW-2-US	Pu-238	0.0023	0.0006	pCi/g	
			UNW-2-US	Pu-239	0.0135	0.0015	pCi/g	
			UNW-2-US	Pu-242T Spike	1.95		pCi	
			UNW-2-US	Pu-242T Recovery	61.03		%	
			UNW-2-US	Pu-242T Recovered	1.19		pCi	
			UNW-2-US	Pu-238 Gross Counts	17		counts	
			UNW-2-US	Pu-238 Background Counts	1.8		counts	
			UNW-2-US					

**** FINAL REPORT ****

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C-27

Method Area: EH-ALPHA

Submission Id: 100020928

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
PU-RAS ENV	200032444	300098563	UNW-2-US	Pu-239 Gross Counts	93		counts	
			UNW-2-US	Pu-239 Background Counts	3.6		counts	
			UNW-2-US	Efficiency	30.56		%	
			UNW-2-US	Count Time	3000.00		min	
			UNW-2-US	Analysis Date	1/30/98		MM/DD/YY	
	200032445	300098567	UNW-2-US	Instrument	ALPHA 32		NONE	
			UNW-3-OS	Pu-238	0.1296	0.0087	pCi/g	
			UNW-3-OS	Pu-239	2.7884	0.1046	pCi/g	
			UNW-3-OS	Pu-242T Spike	1.95		pCi	
			UNW-3-OS	Pu-242T Recovery	38.05		%	
			UNW-3-OS	Pu-242T Recovered	0.74		pCi	
			UNW-3-OS	Pu-238 Gross Counts	321		counts	
			UNW-3-OS	Pu-238 Background Counts	4.2		counts	
			UNW-3-OS	Pu-239 Gross Counts	6820		counts	
			UNW-3-OS	Pu-239 Background Counts	5.4		counts	
			UNW-3-OS	Efficiency	32.36		%	
			UNW-3-OS	Count Time	3000.00		min	
			UNW-3-OS	Analysis Date	1/30/98		MM/DD/YY	
			UNW-3-OS	Instrument	ALPHA 32		NONE	
	200032446	300098570	UNW-3-US	Pu-238	0.0047	0.0009	pCi/g	
			UNW-3-US	Pu-239	0.0254	0.0020	pCi/g	
			UNW-3-US	Pu-242T Spike	1.95		pCi	
			UNW-3-US	Pu-242T Recovery	64.60		%	
			UNW-3-US	Pu-242T Recovered	1.26		pCi	
			UNW-3-US	Pu-238 Gross Counts	41		counts	
			UNW-3-US	Pu-238 Background Counts	4.2		counts	
			UNW-3-US	Pu-239 Gross Counts	204		counts	

**** FINAL REPORT ****

14 03.38

C-20

Method Area: EH-ALPHA

Submission Id: 100020928

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
PU RAS ENV	200032446	300098570	UNW-3-US	Pu-239 Background Counts	7.2		counts	
			UNW-3-US	Efficiency	30.64		%	
			UNW-3-US	Count Time	3000.00		min	
			UNW-3-US	Analysis Date	1/30/98		MM/DD/YY	
			UNW-3-US	Instrument	ALPHA 32		NONE	
			UNW-4-OS	Pu-238	0.0182	0.0018	pCi/g	
			UNW-4-OS	Pu-239	0.1670	0.0072	pCi/g	
			UNW-4-OS	Pu-242T Spike	1.95		pCi	
			UNW-4-OS	Pu-242T Recovery	72.44		%	
			UNW-4-OS	Pu-242T Recovered	1.41		pCi	
	200032447	300098575	UNW-4-OS	Pu-238 Gross Counts	130		counts	
			UNW-4-OS	Pu-238 Background Counts	7.6		counts	
			UNW-4-OS	Pu-239 Gross Counts	1128		counts	
			UNW-4-OS	Pu-239 Background Counts	5.8		counts	
			UNW-4-OS	Efficiency	30.81		%	
			UNW-4-OS	Count Time	3000.00		min	
			UNW-4-OS	Analysis Date	1/30/98		MM/DD/YY	
			UNW-4-OS	Instrument	ALPHA 32		NONE	
			UNW-4-US	Pu-238	0.0915	0.0048	pCi/g	
			UNW-4-US	Pu-239	0.1480	0.0068	pCi/g	
	200032448	300098579	UNW-4-US	Pu-242T Spike	1.95		pCi	
			UNW-4-US	Pu-242T Recovery	69.74		%	
			UNW-4-US	Pu-242T Recovered	1.36		pCi	
			UNW-4-US	Pu-238 Gross Counts	566		counts	
			UNW-4-US	Pu-238 Background Counts	8.0		counts	
			UNW-4-US	Pu-239 Gross Counts	907		counts	
			UNW-4-US	Pu-239 Background Counts	4.6		counts	

**** FINAL REPORT ****

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Method Area: EH-ALPHA

Submission Id : 100020928

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
PU RAS ENV	200032448	300098579	UNW-4-US	Efficiency	31.19		%	
			UNW-4-US	Count Time	3000.00		min	
			UNW-4-US	Analysis Date	1/30/98		MM/DD/YY	
			UNW-4-US	Instrument	ALPHA 32		NONE	
	200032449	300098583	UNW-5-US	Pu-238	0.0514	0.0048	pCi/g	
			UNW-5-US	Pu-239	0.0514	0.0048	pCi/g	
			UNW-5-US	Pu-242T Spike	1.95		pCi	
			UNW-5-US	Pu-242T Recovery	29.61		%	
			UNW-5-US	Pu-242T Recovered	0.58		pCi	
			UNW-5-US	Pu-238 Gross Counts	148		counts	
			UNW-5-US	Pu-238 Background Counts	4.6		counts	
			UNW-5-US	Pu-239 Gross Counts	150		counts	
			UNW-5-US	Pu-239 Background Counts	6.6		counts	
			UNW-5-US	Efficiency	29.18		%	
			UNW-5-US	Count Time	3000.00		min	
			UNW-5-US	Analysis Date	1/30/98		MM/DD/YY	
			UNW-5-US	Instrument	ALPHA 32		NONE	
			UNW-6-US	Pu-238	0.0166	0.0021	pCi/g	
			UNW-6-US	Pu-239	0.1551	0.0078	pCi/g	
			UNW-6-US	Pu-242T Spike	1.95		pCi	
	200032450	300098587	UNW-6-US	Pu-242T Recovery	45.58		%	
			UNW-6-US	Pu-242T Recovered	0.89		pCi	
			UNW-6-US	Pu-238 Gross Counts	85		counts	
			UNW-6-US	Pu-238 Background Counts	6.4		counts	
			UNW-6-US	Pu-239 Gross Counts	736		counts	
			UNW-6-US	Pu-239 Background Counts	3.2		counts	
			UNW-6-US	Efficiency	31.02		%	

**** FINAL REPORT ****

16 94 38

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03-Feb-1998 15:54

Method Area: EH-ALPHA

Submission Id: 100020928

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
PU RAS ENV	200032450	300098587	UNW-6-US	Count Time	3000.00		min	
			UNW-6-US	Analysis Date	1/30/98		MM/DD/YY	
	200032451	300098591	UNW-6-US	Instrument	ALPHA 32		NONE	
			UNW-7-US	Pu-238	0.0111	0.0011	pCi/g	
			UNW-7-US	Pu-239	0.1203	0.0049	pCi/g	
			UNW-7-US	Pu-242T Spike	1.95		pCi	
			UNW-7-US	Pu-242T Recovery	101.24		%	
			UNW-7-US	Pu-242T Recovered	1.97		pCi	
			UNW-7-US	Pu-238 Gross Counts	133		counts	
			UNW-7-US	Pu-238 Background Counts	4.8		counts	
			UNW-7-US	Pu-239 Gross Counts	1393		counts	
			UNW-7-US	Pu-239 Background Counts	6.4		counts	
	200032452	300098595	UNW-7-US	Efficiency	27.80		%	
			UNW-7-US	Count Time	3000.00		min	
			UNW-7-US	Analysis Date	1/30/98		MM/DD/YY	
			UNW-7-US	Instrument	ALPHA 32		NONE	
			UNW-8-OS	Pu-238	0.0002	0.0005	pCi/g	
			UNW-8-OS	Pu-239	0.0131	0.0020	pCi/g	
			UNW-8-OS	Pu-242T Spike	1.95		pCi	
			UNW-8-OS	Pu-242T Recovery	42.41		%	
			UNW-8-OS	Pu-242T Recovered	0.83		pCi	
			UNW-8-OS	Pu-238 Gross Counts	4		counts	
			UNW-8-OS	Pu-238 Background Counts	3.2		counts	
			UNW-8-OS	Pu-239 Gross Counts	60		counts	
			UNW-8-OS	Pu-239 Background Counts	5.0		counts	
			UNW-8-OS	Efficiency	33.31		%	
			UNW-8-OS	Count Time	3000.00		min	
			UNW-8-OS					

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**** FINAL REPORT ****

17 9 38

Method Area: EH-ALPHA

Submission Id: 100020928

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
PU RAS ENV	200032452	300098595	UNW-8-OS	Analysis Date	1/30/98		MM/DD/YY	
			UNW-8-OS	Instrument	ALPHA 32		NONE	
	200032453	300098599	UNW-9-US	Pu-238	0.0032	0.0009	pCi/g	
			UNW-9-US	Pu-239	0.0058	0.0012	pCi/g	
			UNW-9-US	Pu-242T Spike	1.95		pCi	
			UNW-9-US	Pu-242T Recovery	44.01		%	
			UNW-9-US	Pu-242T Recovered	0.86		pCi	
			UNW-9-US	Pu-238 Gross Counts	25		counts	
			UNW-9-US	Pu-238 Background Counts	7.6		counts	
			UNW-9-US	Pu-239 Gross Counts	38		counts	
			UNW-9-US	Pu-239 Background Counts	6.2		counts	
			UNW-9-US	Efficiency	31.05		%	
			UNW-9-US	Count Time	3000.00		min	
			UNW-9-US	Analysis Date	1/30/98		MM/DD/YY	
			UNW-9-US	Instrument	ALPHA 32		NONE	
			UNW-8-US	Pu-238	0.0013	0.0004	pCi/g	
			UNW-8-US	Pu-239	0.0064	0.0008	pCi/g	
			UNW-8-US	Pu-242T Spike	1.95		pCi	
			UNW-8-US	Pu-242T Recovery	100.44		%	
			UNW-8-US	Pu-242T Recovered	1.96		pCi	
			UNW-8-US	Pu-238 Gross Counts	19		counts	
			UNW-8-US	Pu-238 Background Counts	5.4		counts	
			UNW-8-US	Pu-239 Gross Counts	74		counts	
			UNW-8-US	Pu-239 Background Counts	4.6		counts	
			UNW-8-US	Efficiency	31.90		%	
			UNW-8-US	Count Time	3000.00		min	
			UNW-8-US	Analysis Date	1/30/98		MM/DD/YY	

**** FINAL REPORT ****

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03-Feb-1998 15:54

Method Area: EH-ALPHA Submission Id: 100020928

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
PU RAS ENV	200032454	300098603	UNW-8-US	Instrument	ALPHA 32		NONE	
	200032455	300098607	UNW-9-OS	Pu-238	0.0010	0.0005	pCi/g	
			UNW-9-OS	Pu-239	0.0065	0.0010	pCi/g	
			UNW-9-OS	Pu-242T Spike	1.95		pCi	
			UNW-9-OS	Pu-242T Recovery	93.05		%	
			UNW-9-OS	Pu-242T Recovered	1.81		pCi	
			UNW-9-OS	Pu-238 Gross Counts	14		counts	
			UNW-9-OS	Pu-238 Background Counts	6.2		counts	
			UNW-9-OS	Pu-239 Gross Counts	59		counts	
			UNW-9-OS	Pu-239 Background Counts	6.6		counts	
			UNW-9-OS	Efficiency	32.56		%	
			UNW-9-OS	Count Time	3000.00		min	
			UNW-9-OS	Analysis Date	1/30/98		MM/DD/YY	
			UNW-9-OS	Instrument	ALPHA 32		NONE	

DUPLICATE TASKS

None run for this submission

SAMPLE SPIKES

None run for this submission

**** FINAL REPORT ****

19 9/38

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Method Area: EH-ALPHA

Submission Id: 100020928

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	Qualifier	QC Value	QC Uncertainty	QC units	QC Evaluation
00.36194	300098611	Pu-238	4.0268	0.1603	pCi/g		4.2	.15	pCi/g	UNDER CONTROL
		Pu-239	8.4669	0.3127	pCi/g		9	.29	pCi/g	UNDER CONTROL

METHOD BLANKS

None run for this submission

OPEN QC

None run for this submission

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**** FINAL REPORT ****

20938

Method Area: EH-ALPHA

Submission Id: 100020928

CEA
Analyst

Euy
Review

CB
Team Leader

mag
QA Officer

2/04/98
Date

2-04-98
Date

2/5/98
Date

2/5/98
Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level."

**** FINAL REPORT ****

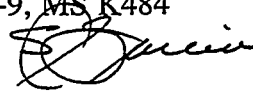
2/2/98

C-35

Los Alamos
NATIONAL LABORATORY
memorandum

Chemical Science & Technology
Inorganic Trace Analysis, CST-9
MS K484
Los Alamos, New Mexico 87545
(505) 665-0270
FAX (505) 665-5952

To/MS: Phillip R. Fresquez, MS M887
From/MS: S. R. Garcia, CST-9, MS K484
Phone/FAX: 5-0270/5-5982
Symbol: CST-9-PRF-98-2
Date: May 5, 1998



**SUBJECT: SUBMISSION 100020928 GSCAN RESULTS IN VEGETATION
ASH**

Please be advised that the GSCAN results for submission id 100020928 have been reported and entered into the LIMS database. Both open and blind QC's were *in control*. As with most vegetation ash samples, there was not sufficient sample to generate a duplicate. The open QC results were previously reported with the CS-137 results and not included in this GSCAN addendum report.

Should you have any questions concerning this request number, please feel free to call or send an e-mail message to me at....garcia_s@lanl.gov.

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LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Page 1 of 1

06-May-1998 12:55

Method Area: EH-GAMMA

Submission Id: 100020928

Requester Name: PHIL FRESQUEZ
Requester Group: ESH-20
Mail Stop: M887
Requester Phone: 667-0815
Requester Fax #: 667-0731
Customer Cost Code: M34A02106CA3
Logged Date: 14-JUL-97
Study: ESH20 BIOLOGICALS
Analytical Service Agreement #:
Due Date: 11-SEP-97
Screening Data: NO SCREENING DATA REQUIRED
Logged by: LBRANCH

CUSTOMER SAMPLES

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC GAMMA	200032427	300098550 300149404	UNW-1-OS	CS-137	0.29	0.43	pCi/g	<i>me</i>
			UNW-1-OS	AC-228	2.01	0.39	pCi/g	
			UNW-1-OS	AM-241	0.15	0.22	pCi/g	
			UNW-1-OS	BE-7	0.97	9.78	pCi/g	
			UNW-1-OS	BI-214	1.24	0.20	pCi/g	
			UNW-1-OS	CO-57	0.21	0.00	pCi/g	
			UNW-1-OS	CO-60	0.32	0.47	pCi/g	
			UNW-1-OS	K-40	21.10	11.22	pCi/g	
			UNW-1-OS	MN-54	0.02	0.00	pCi/g	
			UNW-1-OS	NA-22	0.21	0.31	pCi/g	
			UNW-1-OS	PA-234M	24.97	7.44	pCi/g	
			UNW-1-OS	PB-212	1.82	0.23	pCi/g	
			UNW-1-OS	PB-214	0.99	0.16	pCi/g	
			UNW-1-OS	TL-208	0.86	0.13	pCi/g	
			UNW-1-OS	CS-137	0.33	0.49	pCi/g	
			UNW-1-US	AC-228	1.19	0.25	pCi/g	
	200032442	300098554 300149406	UNW-1-US	AM-241	5.02	7.53	pCi/g	
			UNW-1-US	BE-7	60.37	5.85	pCi/g	
			UNW-1-US	BI-214	0.92	1.38	pCi/g	

**** FINAL REPORT ****

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Method Area: EH-GAMMA

Submission Id: 100020928

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
GENERIC GAMMA	200032442	300149406	UNW-1-US	CO-57	0.56	0.00	pCi/g	
			UNW-1-US	CO-60	0.59	0.89	pCi/g	
			UNW-1-US	K-40	99.25	24.30	pCi/g	
			UNW-1-US	MN-54	0.53	0.00	pCi/g	
			UNW-1-US	NA-22	0.36	0.12	pCi/g	
			UNW-1-US	PA-234M	10.03	15.05	pCi/g	
			UNW-1-US	PB-212	1.03	0.16	pCi/g	
			UNW-1-US	PB-214	0.99	0.16	pCi/g	
			UNW-1-US	TL-208	0.75	0.12	pCi/g	
			UNW-2-US	CS-137	0.18	0.27	pCi/g	
	200032443	300098558 300149405	UNW-2-US	AC-228	2.71	0.51	pCi/g	
			UNW-2-US	AM-241	1.08	0.96	pCi/g	
			UNW-2-US	BE-7	89.80	8.64	pCi/g	
			UNW-2-US	BI-214	1.63	0.28	pCi/g	
			UNW-2-US	CO-57	0.47	0.08	pCi/g	
			UNW-2-US	CO-60	0.74	0.13	pCi/g	
			UNW-2-US	K-40	04.72	10.38	pCi/g	
			UNW-2-US	MN-54	0.68	0.12	pCi/g	
			UNW-2-US	NA-22	0.32	0.09	pCi/g	
			UNW-2-US	PA-234M	-1.91	27.00	pCi/g	
	200032444	300098562 300149407	UNW-2-US	PB-212	-0.19	0.24	pCi/g	
			UNW-2-US	PB-214	1.16	0.22	pCi/g	
			UNW-2-US	TL-208	0.75	0.48	pCi/g	
			UNW-2-US	CS-137	0.23	0.34	pCi/g	
			UNW-2-US	AC-228	1.97	0.45	pCi/g	
			UNW-2-US	AM-241	3.39	5.09	pCi/g	
			UNW-2-US	BE-7	68.91	6.55	pCi/g	

**** FINAL REPORT ****

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Method Area: EH-GAMMA

Submission Id: 100020928

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC GAMMA	200032444	300149407	UNW-2-US	BI-214	0.70	0.14	pCi/g	
			UNW-2-US	CO-57	0.51	0.00	pCi/g	
			UNW-2-US	CO-60	0.38	0.57	pCi/g	
			UNW-2-US	K-40	27.24	19.30	pCi/g	
			UNW-2-US	MN-54	0.08	0.00	pCi/g	
			UNW-2-US	NA-22	0.23	0.34	pCi/g	
			UNW-2-US	PA-234M	5.66	8.48	pCi/g	
			UNW-2-US	PB-212	1.48	0.20	pCi/g	
			UNW-2-US	PB-214	0.84	0.14	pCi/g	
			UNW-2-US	TL-208	0.69	0.14	pCi/g	
	200032445	300098566 300149408	UNW-3-US	CS-137	0.39	0.59	pCi/g	
			UNW-3-US	AC-228	3.13	0.60	pCi/g	
			UNW-3-US	AM-241	1.93	0.41	pCi/g	
			UNW-3-US	BE-7	26.14	11.94	pCi/g	
			UNW-3-US	BI-214	1.47	0.28	pCi/g	
			UNW-3-US	CO-57	0.65	0.00	pCi/g	
			UNW-3-US	CO-60	0.31	0.46	pCi/g	
			UNW-3-US	K-40	61.72	15.61	pCi/g	
			UNW-3-US	MN-54	0.51	0.00	pCi/g	
			UNW-3-US	NA-22	0.58	0.14	pCi/g	
	200032446	300098573 300149409	UNW-3-US	PA-234M	63.28	15.34	pCi/g	
			UNW-3-US	PB-212	3.45	0.43	pCi/g	
			UNW-3-US	PB-214	2.23	0.35	pCi/g	
			UNW-3-US	TL-208	1.36	0.87	pCi/g	
			UNW-3-US	CS-137	0.28	0.42	pCi/g	
			UNW-3-US	AC-228	2.32	0.47	pCi/g	
			UNW-3-US	AM-241	1.73	0.33	pCi/g	

**** FINAL REPORT ****

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Method Area: EH-GAMMA

Submission Id: 100020928

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC GAMMA	200032446	300149409	UNW-3-US	BE-7	35.30	3.92	pCi/g	
			UNW-3-US	BI-214	1.43	0.22	pCi/g	
			UNW-3-US	CO-57	0.02	0.00	pCi/g	
			UNW-3-US	CO-60	0.65	0.18	pCi/g	
			UNW-3-US	K-40	54.71	21.09	pCi/g	
			UNW-3-US	MN-54	0.46	0.00	pCi/g	
			UNW-3-US	NA-22	0.54	0.81	pCi/g	
			UNW-3-US	PA-234M	40.24	60.36	pCi/g	
			UNW-3-US	PB-212	1.71	0.21	pCi/g	
			UNW-3-US	PB-214	1.06	0.17	pCi/g	
			UNW-3-US	TL-208	0.72	0.12	pCi/g	
	200032447	300098574 300149410	UNW-4-OS	ES-137	0.06	0.09	pCi/g	
			UNW-4-OS	AC-228	2.68	0.46	pCi/g	
			UNW-4-OS	AM-241	0.73	0.24	pCi/g	
			UNW-4-OS	BE-7	75.51	7.36	pCi/g	
			UNW-4-OS	BI-214	1.32	0.22	pCi/g	
			UNW-4-OS	CO-57	0.01	0.00	pCi/g	
			UNW-4-OS	CO-60	0.43	0.65	pCi/g	
			UNW-4-OS	K-40	11.24	10.68	pCi/g	
			UNW-4-OS	MN-54	0.39	0.10	pCi/g	
			UNW-4-OS	NA-22	0.26	0.07	pCi/g	
			UNW-4-OS	PA-234M	4.68	7.02	pCi/g	
	200032448	300098578 300149411	UNW-4-OS	PB-212	1.07	1.60	pCi/g	
			UNW-4-OS	PB-214	1.07	0.18	pCi/g	
			UNW-4-OS	TL-208	0.50	0.10	pCi/g	
			UNW-4-US	ES-137	0.11	0.16	pCi/g	
			UNW-4-US	AC-228	1.75	0.37	pCi/g	

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**** FINAL REPORT ****

Method Area: EH-GAMMA

Submission Id: 100020928

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC GAMMA	200032448	300149411	UNW-4-US	AM-241	1.16	1.74	pCi/g	
			UNW-4-US	BE-7	77.63	7.58	pCi/g	
			UNW-4-US	BI-214	1.13	0.21	pCi/g	
			UNW-4-US	CO-57	0.38	0.07	pCi/g	
			UNW-4-US	CO-60	0.48	0.72	pCi/g	
			UNW-4-US	K-40	05.19	18.17	pCi/g	
			UNW-4-US	MN-54	0.11	0.00	pCi/g	
			UNW-4-US	NA-22	-0.04	0.21	pCi/g	
			UNW-4-US	PA-234M	54.15	12.58	pCi/g	
			UNW-4-US	PB-212	1.04	0.17	pCi/g	
			UNW-4-US	PB-214	1.12	0.19	pCi/g	
			UNW-4-US	TL-208	0.79	0.50	pCi/g	
			UNW-5-US	CS-137	0.00	1.80	pCi/g	
			UNW-5-US	AC-228	3.53	0.61	pCi/g	
			UNW-5-US	AM-241	4.20	0.58	pCi/g	
			UNW-5-US	BE-7	64.79	6.32	pCi/g	
			UNW-5-US	BI-214	1.29	0.23	pCi/g	
			UNW-5-US	CO-57	0.68	0.10	pCi/g	
			UNW-5-US	CO-60	0.90	0.19	pCi/g	
			UNW-5-US	K-40	74.15	22.93	pCi/g	
			UNW-5-US	MN-54	0.64	0.13	pCi/g	
			UNW-5-US	NA-22	0.47	0.11	pCi/g	
			UNW-5-US	PA-234M	52.41	14.43	pCi/g	
			UNW-5-US	PB-212	1.74	0.22	pCi/g	
			UNW-5-US	PB-214	1.60	0.22	pCi/g	
			UNW-5-US	TL-208	0.94	0.60	pCi/g	
			UNW-6-US	CS-137	0.03	1.80	pCi/g	
	200032450	300098586						

**** FINAL REPORT ****

Method Area: EH-GAMMA

Submission Id: 100020928

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
GENERIC GAMMA	200032450	300149413	UNW-6-US	AC-228	2.94	0.49	pCi/g	
			UNW-6-US	AM-241	2.75	0.50	pCi/g	
			UNW-6-US	BE-7	78.08	7.49	pCi/g	
			UNW-6-US	BI-214	1.33	0.23	pCi/g	
			UNW-6-US	CO-57	-0.10	0.00	pCi/g	
			UNW-6-US	CO-60	0.63	0.12	pCi/g	
			UNW-6-US	K-40	44.42	20.71	pCi/g	
			UNW-6-US	MN-54	0.52	0.00	pCi/g	
			UNW-6-US	NA-22	0.15	0.23	pCi/g	
			UNW-6-US	PA-234M	22.11	33.17	pCi/g	
			UNW-6-US	PB-212	2.06	0.26	pCi/g	
			UNW-6-US	PB-214	1.93	0.29	pCi/g	
			UNW-6-US	TL-208	1.16	0.17	pCi/g	
			UNW-7-US	ES-137	0.11	0.17	pCi/g	
			UNW-7-US	AC-228	2.60	0.42	pCi/g	
			UNW-7-US	AM-241	1.56	0.36	pCi/g	
			UNW-7-US	BE-7	64.35	6.07	pCi/g	
			UNW-7-US	BI-214	1.12	0.19	pCi/g	
			UNW-7-US	CO-57	0.67	0.00	pCi/g	
			UNW-7-US	CO-60	0.21	0.32	pCi/g	
			UNW-7-US	K-40	22.99	18.68	pCi/g	
			UNW-7-US	MN-54	0.23	0.07	pCi/g	
			UNW-7-US	NA-22	0.23	0.07	pCi/g	
			UNW-7-US	PA-234M	56.09	12.68	pCi/g	
			UNW-7-US	PB-212	0.90	0.15	pCi/g	
			UNW-7-US	PB-214	0.42	0.63	pCi/g	
			UNW-7-US	TL-208	0.66	0.11	pCi/g	

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**** FINAL REPORT ****

Method Area: EH-GAMMA

Submission Id: 100020928

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
GENERIC GAMMA	200032452	300098594 300149415	UNW-8-OS UNW-8-OS UNW-8-OS UNW-8-OS UNW-8-OS UNW-8-OS UNW-8-OS UNW-8-OS UNW-8-OS UNW-8-OS UNW-8-OS UNW-8-OS UNW-8-OS UNW-8-OS UNW-8-OS UNW-8-OS UNW-8-OS UNW-8-OS UNW-8-OS UNW-8-OS	GS-197	0.24	0.36	pCi/g	
				AC-228	1.73	0.29	pCi/g	
				AM-241	0.79	0.96	pCi/g	
				BE-7	27.62	11.45	pCi/g	
				BI-214	0.89	0.16	pCi/g	
				CO-57	0.33	0.00	pCi/g	
				CO-60	0.57	0.14	pCi/g	
				K-40	13.98	10.90	pCi/g	
				MN-54	0.18	0.00	pCi/g	
				NA-22	0.16	0.24	pCi/g	
				PA-234M	24.80	37.20	pCi/g	
				PB-212	1.79	0.23	pCi/g	
				PB-214	1.14	0.20	pCi/g	
				TL-208	0.42	0.08	pCi/g	
				GS-197	0.37	0.08	pCi/g	
				AC-228	1.98	0.40	pCi/g	
				AM-241	1.22	0.25	pCi/g	
				BE-7	36.95	3.98	pCi/g	
				BI-214	1.09	0.18	pCi/g	
				CO-57	0.46	0.07	pCi/g	
				CO-60	0.75	0.17	pCi/g	
				K-40	37.38	19.75	pCi/g	
				MN-54	0.49	0.00	pCi/g	
				NA-22	0.60	0.12	pCi/g	
				PA-234M	53.96	12.64	pCi/g	
				PB-212	0.83	1.25	pCi/g	
				PB-214	0.94	0.17	pCi/g	
	200032453	300098598 300149416	UNW-9-US UNW-9-US UNW-9-US UNW-9-US UNW-9-US UNW-9-US UNW-9-US UNW-9-US UNW-9-US UNW-9-US UNW-9-US UNW-9-US UNW-9-US UNW-9-US UNW-9-US UNW-9-US UNW-9-US UNW-9-US UNW-9-US	GS-197	0.37	0.08	pCi/g	
				AC-228	1.98	0.40	pCi/g	
				AM-241	1.22	0.25	pCi/g	
				BE-7	36.95	3.98	pCi/g	
				BI-214	1.09	0.18	pCi/g	
				CO-57	0.46	0.07	pCi/g	
				CO-60	0.75	0.17	pCi/g	
				K-40	37.38	19.75	pCi/g	
				MN-54	0.49	0.00	pCi/g	
				NA-22	0.60	0.12	pCi/g	
				PA-234M	53.96	12.64	pCi/g	
				PB-212	0.83	1.25	pCi/g	
				PB-214	0.94	0.17	pCi/g	

**** FINAL REPORT ****

Method Area: EH - GAMMA

Submission Id: 100020928

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC GAMMA	200032453	300149416	UNW-9-US	TL-208	0.52	0.09	pCi/g	
	200032454	300098602	UNW-8-US	CS-137	0.03	1.80	pCi/g	
	300149417		UNW-8-US	AC-228	1.28	1.92	pCi/g	
			UNW-8-US	AM-241	1.28	1.92	pCi/g	
			UNW-8-US	BE-7	39.98	4.33	pCi/g	
			UNW-8-US	BI-214	1.01	0.18	pCi/g	
			UNW-8-US	CO-57	0.59	0.09	pCi/g	
			UNW-8-US	CO-60	0.75	0.17	pCi/g	
			UNW-8-US	K-40	15.69	18.40	pCi/g	
			UNW-8-US	MN-54	0.34	0.08	pCi/g	
			UNW-8-US	NA-22	0.36	0.55	pCi/g	
			UNW-8-US	PA-234M	36.50	54.74	pCi/g	
			UNW-8-US	PB-212	0.74	0.13	pCi/g	
			UNW-8-US	PB-214	0.97	0.17	pCi/g	
			UNW-8-US	TL-208	0.35	0.22	pCi/g	
	200032455	300098606	UNW-9-OS	CS-137	0.34	0.50	pCi/g	
		300149403	UNW-9-OS	AC-228	2.67	0.53	pCi/g	
			UNW-9-OS	AM-241	0.24	0.35	pCi/g	
			UNW-9-OS	BE-7	31.06	11.87	pCi/g	
			UNW-9-OS	BI-214	0.97	0.18	pCi/g	
			UNW-9-OS	CO-57	0.59	0.09	pCi/g	
			UNW-9-OS	CO-60	1.40	0.24	pCi/g	
			UNW-9-OS	K-40	61.86	14.99	pCi/g	
			UNW-9-OS	MN-54	0.10	0.00	pCi/g	
			UNW-9-OS	NA-22	0.48	0.73	pCi/g	
			UNW-9-OS	PA-234M	34.55	10.20	pCi/g	
			UNW-9-OS	PB-212	1.53	0.22	pCi/g	

**** FINAL REPORT ****

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Method Area: EH-GAMMA

Submission Id: 100020928

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
GENERIC GAMMA	200032455	300149403	UNW-9-OS	PB-214	0.98	0.17	pCi/g	
			UNW-9-OS	TL-208	0.46	0.10	pCi/g	

DUPLICATE TASKS

None run for this submission

SAMPLE SPIKES

None run for this submission

C-45

Method Area: EH - GAMMA

Submission Id: 100020928

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

Customer Id	Task Id	Component	Result	Uncertainty	Units	Qualifier	QC Value	QC Uncertainty	QC units	QC Evaluation
00.36893	300098610	Cs-137	47.5	3.3	pCi/g		46.8	1.54	pCi/g	UNDER CONTROL

METHOD BLANKS

None run for this submission

OPEN QC

None run for this submission

3C-46

**** FINAL REPORT ****

06-May-1998 12:55

Method Area: EH-GAMMA Submission Id: 100020928

[Signature]
Analyst

[Signature]
Review

[Signature]
Team Leader

NK
QA Officer

5/5/98
Date

5/5/98
Date

5/5/98
Date

05/07/98
Date

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No Sample Discrepancies Noted by Sample Management Section

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level."

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method Area: EH-ALPHA

Submission Id: 100020456

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	M34A02106CA3	Due Date:	25-AUG-97
Requester Group:	ESH-20	Logged Date:	26-JUN-97	Screening Data:	NO SCREENING DATA REQUIRED
Mail Stop:	M887	Study:	ESH20 BIOLOGICALS	Logged by:	DDECKER
Requester Phone:	667-0815	Analytical Service Agreement #:			
Requester Fax #:	667-0731				

CUSTOMER SAMPLES

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
H-3 LS ENV	200030617	300094388	UW-1-OS	H-3	72000	3300	pCi/L	
			UW-1-OS	H-3 MDA	882		pCi/L	
	200030618	300094389	UW-1-US	H-3	19200	1600	pCi/L	
			UW-1-US	H-3 MDA	882		pCi/L	
	200030619	300094390	UW-2-OS	H-3	207000	7100	pCi/L	
			UW-2-OS	H-3 MDA	882		pCi/L	
	200030620	300094391	UW-2-US	H-3	77500	3400	pCi/L	
			UW-2-US	H-3 MDA	882		pCi/L	
	200030621	300094392	UW-3-OS	H-3	860	740	pCi/L	
			UW-3-OS	H-3 MDA	882		pCi/L	
	200030622	300094393	UW-3-US	H-3	760	730	pCi/L	
			UW-3-US	H-3 MDA	882		pCi/L	
	200030623	300094394	UW-4-OS	H-3	1130	750	pCi/L	
			UW-4-OS	H-3 MDA	882		pCi/L	
	200030624	300094395	UW-4-US	H-3	1120	750	pCi/L	
			UW-4-US	H-3 MDA	882		pCi/L	
	200030625	300094396	UW-5-US	H-3	664000	19000	pCi/L	
			UW-5-US	H-3 MDA	882		pCi/L	
	200030626	300094397	UW-6-US	H-3	1657000	46000	pCi/L	

**** FINAL REPORT ****

Method Area: EH-ALPHA

Submission Id: 100020456

900000

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
H-3 LS ENV	200030626	300094397	UW-6-US	H-3 MDA	882		pCi/L	
	200030627	300094398	UW-7-US	H-3	10600	1200	pCi/L	
			UW-7-US	H-3 MDA	882		pCi/L	
	200030628	300094399	UW-8-OS	H-3	190	690	pCi/L	
			UW-8-OS	H-3 MDA	882		pCi/L	
	200030629	300094400	UW-8-US	H-3	600	720	pCi/L	
			UW-8-US	H-3 MDA	882		pCi/L	
	200030630	300094401	UW-9-OS	H-3	40	680	pCi/L	
			UW-9-OS	H-3 MDA	882		pCi/L	
	200030631	300094402	UW-9-US	H-3	120	690	pCi/L	
			UW-9-US	H-3 MDA	882		pCi/L	

DUPLICATE TASKS

None run for this submission

SAMPLE SPIKES

None run for this submission

**** FINAL REPORT ****

Method Area: EH-ALPHA

Submission Id : 100020456

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	Qualifier	QC Value	QC Uncertainty	QC units	QC Evaluation
06261997	300131963	H-3	13555	1300	pCi/L		17170	640	pCi/L	WARNING 2-3SIG

METHOD BLANKS

None run for this submission

OPEN QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	Qualifier	QC Value	QC Uncertainty	QC units	QC Evaluation
00.35619	300131964	H-3	-0.00006	0.00067	uCi/L		0	0	uCi/L	UNDER CONTROL
00.37241	300131965	H-3	0.0129	0.0013	uCi/L		0.01503	0.0015	uCi/L	UNDER CONTROL

000000

**** FINAL REPORT ****

Method Area: EH-ALPHA

Submission Id: 100020456

Cip
Analyst

LB
Review
En EAC

CB
Team Leader

mag
QA Officer

1/25/98
Date

1/26/98
Date

1/26/98
Date

1/26/98
Date

C-51

800000

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level."

**** FINAL REPORT ****

SAMPLE MANAGEMENT
RECEIVING RECORD

CUSTOMER INFORMATION

Cost Account:

Name <i>Phil FRESQUEE</i>	Group <i>ESH-20</i>	Phone <i>7-0815</i>	Mail Stop <i>1887</i>	Program Code <i>6 CA M34A 0210</i>
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PROJECT DESCRIPTION

<i>UNW-1-OS</i> } <i>a1</i>	<i>UNW-3-US</i> }	<i>UNW-7-US</i> }
<i>UNW-1-US</i> } <i>10</i>	<i>UNW-4-OS</i> } <i>a1</i>	<i>UNW-8-OS</i> } <i>6-11-97</i>
<i>UNW-2-OS</i> } <i>10</i>	<i>UNW-4-US</i> } <i>10</i>	<i>UNW-8-US</i> }
<i>UNW-2-US</i> }	<i>UNW-5-US</i> }	<i>UNW-9-OS</i> }
<i>UNW-3-OS 6/17/97</i>	<i>UNW-6-US</i> }	<i>UNW-9-US</i> }

SAMPLE RECEIVING INFORMATION

Received By <i>Diana L. Drake</i>	Date Received <i>7/11/97</i>	Sample Matrix <i>BV</i>	No. of Samples <i>15</i>	Samples Received Under Chain-of-Custody? ☒ Yes ☐ No
Samples Checked For ☒ Preservation ☐ Container Integrity ☐ Sample Size ☐ Sample Integrity <i>NONE</i>		Condition of Sample Received ☒ Acceptable ☐ Not Acceptable (Complete an SRD Record)		

REQUESTED ANALYSES

Inorganic	Organics	...
		<i>PU-238 GSCAN.</i> <i>PU-239</i> <i>AM-241</i> <i>U-234</i> <i>U-235</i> <i>U-238</i>
Request No.	Request No.	Request No.
Comments <i>Unwashed vegetation Area E</i>		
Collection Date <i>SEE Project Description</i>		
Customer Signature <i>Phil Fresquee</i>	Date <i>7/11/97</i>	
Sample Management Custodian Signature <i>Diana Drake</i>	Date <i>7/11/97</i>	

CHAIN-OF-CUSTODY RECORD

1134A-0210 00A3
Soils and Foodstuffs (WLE6G)

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

P.I.# (505) 667-0815
ESH-20 NIS M887

Project Name		Request the following analysis:		Sample Name/Number		Sample Location/Remarks	
Date	Time						
Area G - Vag.		238 pr, 239 pr, 24 Am		1	1	TA-54 Area G	
Paul Turner, Tony Tecumseh		ISO - U, gamma-Spec		1	1	(unwashed) UMW	
David Horneburger, Luis Navarrete				1	1		
6/16/97	10:30	UMW-1-OS		1	1	South 3H shaft field	
	"	UMW-1-US		1	1	" "	
6/16/97	10:30	UMW-2-OS		1	1	West 3H " "	
	"	UMW-2-US		1	1	" " " "	
6/17/97	11:30	UMW-3-OS		1	1	E of new pit	
	"	UMW-3-US		1	1	E of " " "	
6/17/97	9:30	UMW-4-OS		1	1	North of Tree pads 3, 4	
	"	UMW-4-US		1	1	" " " "	
6/17/97	10:30	UMW-5-US		1	1	Tree pad #3	
6/17/97	10:30	UMW-6-US		1	1	Tree pad #4	
6/17/97	10:50	UMW-7-US		1	1	Pits #7 & 24	
6/17/97	12:00	UMW-8-OS		1	1	Expansion Area	
6/17/97	12:00	UMW-9-US		1	1	" " " "	
6/17/97	1:30	UMW-9-OS		1	1	Back ground (BNP)	
Relinquished by: (signature)		Received by: (signature)		Relinquished by: (signature)		Received by: (signature)	
Date/Time		Date/Time		Date/Time		Date/Time	
6/17/97 2:45		Jana W. D. [Signature]		6/17/97		6/17/97	
Relinquished by: (signature)		Received by: (signature)		Relinquished by: (signature)		Received by: (signature)	
Date/Time		Date/Time		Date/Time		Date/Time	
6/17/97		6/17/97		6/17/97		6/17/97	
Relinquished by: (signature)		Received for Lab. by: (signature)		Date/Time		Remarks:	
Date/Time		Date/Time		Date/Time		Date/Time	

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APPENDIX D

CST ANALYTICAL REPORTS OF TRITIUM IN UNWASHED JUNIPER SAMPLES AT AREA G

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Page 1 of 3

25-Jan-1998 15:47

Method Area: EH-ALPHA

Submission Id: 100020894

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	M34AO2106CA3	Due Date:	15-SEP-97
Requester Group:	ESH-20	Logged Date:	11-JUL-97	Screening Data:	NO SCREENING DATA REQUIRED
Mail Stop:	M887	Study:	ESH20 BIOLOGICALS	Logged by:	DDECKER
Requester Phone:	667-0815	Analytical Service Agreement #:			
Requester Fax #:	667-0731				

CUSTOMER SAMPLES

<u>Method</u>	<u>Sample Id</u>	<u>Task Id</u>	<u>Customer Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>
H-3 LS ENV	200032346	300098385	AREA G-150-OS	H-3	530000000	10000000	pCi/L	
			AREA G-150-OS	H-3 MDA	882		pCi/L	

DUPLICATE TASKS

None run for this submission

SAMPLE SPIKES

None run for this submission

200000

D-1

**** FINAL REPORT ****

Method Area: EH-ALPHA

Submission Id : 100020894

***** CST QUALITY ASSURANCE REPORT *****

BLIND QC

None run for this submission

METHOD BLANKS

None run for this submission

OPEN QC

D-2

Customer Id	Task Id	Component	Result Value	Uncertainty	Units uCi/L	Qualifier	QC Value	QC Uncertainty	QC units uCi/L	QC Evaluation UNDER CONTROL UNDER CONTROL
00.35619	300131961	H-3	0.00020	0.00069	uCi/L		0	0		
00.37241	300131962	H-3	0.0136	0.0013	uCi/L		0.01503	0.0015		

000003

Method Area: EH-ALPHA

Submission Id: 100020894

Cip
Analyst

CB
Review
EAC

CB
Team Leader

mag
QA Officer

1/25/98
Date

1/26/98
Date

1/26/98
Date

1/26/98
Date

000004

D-3

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level."

**** FINAL REPORT ****

SAMPLE MANAGEMENT
RECEIVING RECORD

CUSTOMER INFORMATION

Cost Account:

Name: <i>Phil FRESQUE</i>	Group: <i>ESH-20</i>	Phone: <i>7-0815</i>	Mail Stop: <i>M887</i>	Program Code: <i>M34A 0210</i>
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PROJECT DESCRIPTION

<i>AREA G-150-05</i>

SAMPLE RECEIVING INFORMATION

Received By: <i>Diana L Decker</i>	Date Received: <i>7/11/97</i>	Sample Matrix: <i>WU</i>	No. of Samples: <i>1</i>	Samples Received Under Chain-of-Custody? ☒ Yes ☐ No
Samples Checked For: ☒ Preservation ☐ Container Integrity ☐ Sample Size ☐ Sample Integrity <i>refrigerate</i>		Condition of Sample Received: ☒ Acceptable ☐ Not Acceptable (Complete an SRD Record)		

REQUESTED ANALYSES

Inorganic	Organics	
		<i>H-3</i>
Request No.	Request No.	Request No.
Comments		
Collection Date: <i>7/11/97</i>		
Customer Signature: <i>[Signature]</i>		Date: <i>7/11/97</i>
Sample Management Custodian Signature: <i>Diana L Decker</i>		Date: <i>7/11/97</i>

MAIN-OF-CUSTODY RECORD
11341A 0210 00A3
Soils and Foodstuffs (~~7520~~ WIEG)

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Soils and Foodstuffs (7-2011)
P.L.# (505) 667-0815
ESH-20 MS M887

[illegible]

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