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around the DARHT Facility:
Construction Phase (1997)*

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*Baseline Concentrations of Radionuclides
and Heavy Metals in Soils and Vegetation
around the DARHT Facility:
Construction Phase (1997)*

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BASELINE CONCENTRATIONS OF RADIONUCLIDES AND HEAVY METALS IN SOILS AND VEGETATION AROUND THE DARHT FACILITY: CONSTRUCTION PHASE (1997)

by

P.R. Fresquez, H.T. Haagenstad, and L. Naranjo, Jr.

ABSTRACT

As part of the Department of Energy's Mitigation Action Plan for the Dual Axis Radiographic Hydrodynamic Test (DARHT) facility at Los Alamos National Laboratory (LANL), baseline concentrations of radionuclides (^3H , ^{137}Cs , ^{90}Sr , ^{238}Pu , $^{239,240}\text{Pu}$, ^{241}Am , and ^{235}U) and heavy metals (Ag, As, Ba, Be, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Se, and Tl) in soil, sediment, and vegetation (overstory and understory) around the DARHT facility during the construction phase in 1997 were determined. Most radionuclides and heavy metals in soils, sediments, and vegetation, with the exception of ^{90}Sr in soils and sediments, were within upper (95%) limit background concentrations. Although the levels of ^{90}Sr in soils and sediments around the DARHT facility were higher than background, they were below LANL screening action levels ($<4.4 \text{ pCi g}^{-1}$ dry) and are of no concern.

I. INTRODUCTION

In response to a Record of Decision concerning the Environmental Impact Statement for the Dual Axis Radiographic Hydrodynamic Test (DARHT) facility (USDOE 1995a) at Los Alamos National Laboratory (LANL) (USDOE 1995b), the United States Department of Energy (DOE), prepared and issued a Mitigation Action Plan (MAP). The DARHT MAP is a plan that documents, in part, the DOE's

commitment to protecting natural and cultural resources during the construction, operation, and decommissioning phases of the DARHT facility (USDOE 1996). One of the initial tasks identified in the MAP—section VIII.A.1.(a), "Impacts Affecting the General Environment"—mandates the collection of soils, invertebrates, plants, mammals, birds, and road kill from around the DARHT facility during

the construction phase, as well as from a control site, to determine baseline concentrations of radioactive or toxic materials.

The objective of this ongoing study is to determine baseline levels of radionuclides and heavy metals in soils, sediments, and vegetation around the DARHT facility prior to the start-up of operations, as per section VIII.A.1.(a) of the DARHT MAP. Similar data regarding mammals and birds are being collected under related, but separate studies. The data from the present study were compared with upper (95%) limit radionuclide and heavy metal concentrations in soils, sediments, and similar vegetation collected from an off-site background location up-wind from the Laboratory. This is the third year that baseline data has been collected within and around the DARHT facility site; the first and second years can be found in Fresquez et al. (1997a).

II. METHODS/MATERIALS

Four composite soil surface samples were collected with a stainless steel soil ring 10 cm (4 in.) in diameter driven 5 cm (2 in.) into the soil (ASTM 1990) approximately 24 m (80 ft) away,

but within the large berm wall, from the N, E, S, and W side of the DARHT facility (Fresquez 1996) (Figure 1). Samples were collected from the center and corners of a square area 10 m (32 ft) per side; the five subsamples were combined and mixed thoroughly in a three-gallon Ziploc® bag to form a composite sample. In addition, three sediment grab samples were collected at the 0- to 15-cm (0- to 6-in.) depth with a stainless steel scoop within three drainage channel/ponding areas originating from the DARHT facility on the N, W, and SW sides. Most of the sediment material on the N side was a result of erosion off the berm wall, whereas sediments from the other sites were from erosional processes off the grounds themselves. All soil and sediment samples were placed in prelabeled 500-mL polypropylene bottles for radionuclide analysis and prelabeled 125-mL polypropylene bottles for inorganic analysis. Bottles were fitted with chain-of-custody tape, placed into individual Ziploc® plastic bags, transported in a locked ice chest cooled to approximately 4°C, and submitted to the Environmental Chemistry Group (CST-9) at LANL for

Figure 1. Sampling locations at DARHT at TA-15.

the analysis of radionuclides (^3H , ^{137}Cs , ^{238}Pu , $^{239,240}\text{Pu}$, ^{90}Sr , ^{241}Am , and total uranium) and heavy metals (Ag, As, Ba, Be, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Se, and Tl). All methods of radionuclide (Purtymun et al. 1987, Fresquez et al. 1996a) and heavy metal (Fresquez et al. 1996b) analysis have been previously reported; uranium, however, was analyzed by kinetic phosphorescence analysis (KPA). Results are reported in pCi mL⁻¹ (of soil moisture) for tritium, $\mu\text{g g}^{-1}$ dry for uranium and heavy metals, and pCi g⁻¹ dry soil for all the other radioisotopes.

Vegetation samples were collected from overstory and understory materials as close as possible to the soil sampling locations. Overstory samples, mostly ponderosa pine (*Pinus ponderosa*) trees, consisted of tree-shoot tips approximately 2.5 to 5 cm (1 to 2 in.) in length at the 1.2- to 1.5-m (4- to 5-ft) height (Fresquez et al. 1996c). Understory samples, mostly grasses and forb species (top growth), were collected from the center and corners of a 10- by 10-m (32- by 32-ft) area. The pine tree(s) acted as the center of the square. Samples consisting of 0.9 to 1.4 kg (2 to 3 lb) of composited material were double

bagged in labeled Ziploc® plastic bags and transported to the Laboratory in locked ice chests. At the Laboratory, unwashed samples from each bag were divided into three subsets to provide analysis material for tritium, heavy metals, and other radionuclides (^{90}Sr , ^{238}Pu , $^{239,240}\text{Pu}$, ^{137}Cs , ^{241}Am , and total uranium).

Subsamples for ^3H analysis were placed in a glass beaker apparatus to collect distillate water (Salazar 1984). Vegetation subsamples for heavy metals were dried at 70°C for 48 h before being ground in a Wiley mill (40-mm screen). The rest of the subsample set(s) were placed in 1-L glass beakers and ashed at 500°C for 120 h; after ashing, each sample was pulverized and homogenized, transferred to labeled 500-mL polypropylene bottles, and submitted with the distillate (water) samples under full chain-of-custody to CST-9. Radionuclides and heavy metals in vegetation have been previously reported (Fresquez et al. 1996a, Fresquez et al. 1997b, Fresquez et al. 1996c). Results were reported in pCi mL⁻¹ (of tissue moisture) for tritium, $\mu\text{g g}^{-1}$ ash for uranium, and pCi g⁻¹ of ash for all the other isotopes. Results in grams of ash

are usually two to four orders of magnitude higher than live (wet) weight. Also, heavy metals were reported as $\mu\text{g g}^{-1}$ dry.

III. RESULTS

A summarization of baseline radionuclide and heavy metal concentrations in soils, sediments, and vegetation collected around the DARHT facility during the second year of construction activities can be found in Tables 1 through 4 (original analytical data reports can be found in Appendixes A through D). These data were compared to current (samples collected in 1997 from an off-site background location up-wind of LANL) and Regional Statistical Reference Levels (RSRLs) sample data sets collected as part of the Soil (Fresquez et al. 1998) and Vegetation (Fresquez et al. 1997b) Surveillance Programs. RSRLs are the upper (95%) limit background concentration (mean plus two standard deviations from data collected from 1993 through 1997) for worldwide fallout of ^3H , ^{90}Sr , ^{137}Cs , ^{241}Am , ^{238}Pu , $^{239,240}\text{Pu}$, and total U (ESP 1998). Also, soils radiological and heavy metal data were compared to LANL Screening

Action Levels (SALs)—concentration(s) developed by the Environmental Restoration Program at the Laboratory are derived from a risk assessment exposure model using a 10 mrem/y dose, and are used to identify the presence of contaminants of concern (FIMAD 1997).

Most radionuclides (Table 1), with the exception of ^{90}Sr , and heavy metals (Table 2) in soils and sediments collected around the DARHT facility in 1997 were within or just above RSRLs. Most concentrations of ^{90}Sr in soils and sediments collected around the DARHT facility were above the RSRL (e.g., $>0.71 \text{ pCi g}^{-1}$ dry); and, although most of these values could be considered nondetectable (i.e., where the analytical result is lower than two times its counting uncertainty), the majority of samples tended to be higher than current year and upper level background and were consistent with a sediment sample collected on the north side of the DARHT facility (and berm) in 1996 that contained an abnormally high amount of ^{90}Sr (4.3 pCi g^{-1} dry) (Fresquez et al. 1997a). For these reasons, albeit all of the soil and sediment samples were below LANL SALs and are, therefore, of no concern, soil and sediment samples

will be continued to be resampled from the same locations in 1998 and monitored closely.

Most radionuclides (Table 3), including ^{90}Sr , and heavy metals (Table 4) in vegetation (overstory and understory) collected around the DARHT facility were within RSRLs. These data compare well with data collected in the previous year (Fresquez et al. 1997a).

Table 1. Radionuclide concentrations in soil and sediment collected around the DARHT facility in 1997.

Location	^3H pCi mL⁻¹	^{90}Sr pCi g⁻¹ dry	^{106}U μg g⁻¹ dry	^{137}Cs pCi g⁻¹ dry	^{238}Pu pCi g⁻¹ dry	$^{239,240}\text{Pu}$ pCi g⁻¹ dry	^{241}Am pCi g⁻¹ dry
Soil							
North	0.52 (0.70) ¹	3.01 (1.59)	4.11 (0.41)	0.13 (0.02)	0.000 (0.000)	0.005 (0.001)	0.006 (0.002)
East	0.51 (0.70)	1.56 (1.33)	1.53 (0.15)	0.02 (0.01)	0.001 (0.001)	0.000 (0.000)	0.002 (0.002)
South	0.22 (0.68)	3.41 (1.80)	1.41 (0.14)	0.01 (0.02)	0.001 (0.001)	0.001 (0.001)	0.006 (0.008)
West	0.25 (0.68)	1.84 (1.20)	2.21 (0.22)	0.05 (0.01)	0.001 (0.000)	0.003 (0.001)	0.002 (0.001)
<i>Mean (SD)</i>	0.38 (0.16)	2.46 (0.89)	2.32 (1.24)	0.05 (0.05)	0.001 (0.001)	0.002 (0.002)	0.004 (0.002)
Sediment							
North	0.61 (0.70)	1.82 (1.10)	5.46 (0.55)	0.16 (0.02)	0.000 (0.000)	0.008 (0.001)	0.004 (0.002)
East	0.43 (0.69)	2.23 (1.34)	4.35 (0.44)	0.20 (0.03)	0.000 (0.001)	0.005 (0.001)	0.005 (0.004)
South west	0.95 (0.72)	0.68 (0.57)	2.18 (0.22)	0.05 (0.02)	0.001 (0.001)	0.002 (0.001)	0.001 (0.001)
<i>Mean (SD)</i>	0.66 (0.26)	1.58 (0.80)	4.00 (1.67)	0.14 (0.08)	0.000 (0.001)	0.005 (0.003)	0.003 (0.002)
BG²	-0.16 (0.06)	0.79 (0.26)	2.03 (0.65)	0.25 (0.06)	0.000 (0.001)	0.012 (0.001)	0.006 (0.004)
RSRL³	1.06	0.71	3.16	0.60	0.010	0.021	0.011
LANL SAL⁴	1900.00	4.40	29.00	5.10	27.000	24.000	22.000

¹(± one counting uncertainty); values are the uncertainty in the analytical result at the 65% level.

²Background from ESP 1998.

³Regional Statistical Reference Level; this is the upper (95%) limit background concentration (mean + 2 std dev) for Embudo, Cochiti, and Jemez from 1993–1997 (ESP 1998).

⁴Los Alamos National Laboratory Screening Action Level (FIMAD 1997).

Table 2. Total heavy metal concentrations ($\mu\text{g g}^{-1}$ dry) in soil and sediment collected around the DARHT facility in 1997.

Location	Ag	As	Ba	Be	Cd	Cr	Cu	Hg	Ni	Pb	Sb	Se	Tl
Soil													
North	1.0 ¹	1.96	119.2	0.83	0.45 ¹	9.9	4.6	0.03 ¹	6.7	9.0	0.3 ¹	0.2 ¹	0.2 ¹
East	1.0 ¹	0.76	49.0	0.48	0.45 ¹	4.0	2.2	0.03 ¹	0.2 ¹	4.6	0.3 ¹	0.2 ¹	0.2 ¹
South	1.0 ¹	0.66	42.0	0.47	0.45 ¹	4.0	2.4	0.03 ¹	0.2 ¹	5.2	0.3 ¹	0.2 ¹	0.2 ¹
West	1.0 ¹	2.88	101.2	0.95	0.45 ¹	9.8	6.0	0.03 ¹	7.4	9.9	0.3 ¹	0.2 ¹	0.2 ¹
<i>Mean</i>	1.0	1.57	77.9	0.68	0.45	6.9	3.8	0.03	4.5	7.2	0.3	0.2	0.2
(SD)	(0.0)	(1.06)	(38.2)	(0.24)	(0.00)	(3.4)	(1.8)	(0.00)	(2.9)	(2.7)	(0.0)	(0.0)	(0.0)
Sediment													
North	1.0 ¹	1.88	101.8	0.81	0.45 ¹	8.0	4.4	0.03 ¹	5.6	8.2	0.3 ¹	0.2 ¹	0.2 ¹
East	1.0 ¹	2.40	116.8	1.05	0.45 ¹	10.1	7.9	0.03 ¹	6.4	10.2	0.3 ¹	0.2 ¹	0.2 ¹
South west	8.5	2.32	76.9	0.63	0.45 ¹	6.9	4.6	0.03 ¹	4.7	7.2	0.3 ¹	0.2 ¹	0.2 ¹
<i>Mean</i>	3.5	2.20	98.5	0.83	0.45	8.3	5.6	0.03	5.6	8.5	0.3	0.2	0.2
(SD)	(4.3)	(0.28)	(20.2)	(0.21)	(0.00)	(1.6)	(2.0)	(0.00)	(0.9)	(1.5)	(0.0)	(0.0)	(0.0)
BG ²	0.13	2.4	192	0.99	0.33	12.9	7.5	0.03	11.0	9.3	0.3	0.4	0.3
RSRL ³	2.00	5.9	187	0.71	0.25	14.6	10.8	0.03	10.8	15.2	0.2	0.8	1.4
LANL SAL ⁴	400.00	5.9	5600	0.99	80.00	400.0	3000.0	24.00	1600.0	500.0	32.0	400.0	6.4

¹Less than values were reduced by one-half the concentration.

²Background from Fresquez et al. (1997a).

³Regional Statistical Reference Level; this is the upper (95%) limit background concentration (mean + 2 std dev) from Fresquez et al. (1997b).

⁴Los Alamos National Laboratory Screening Action Level (FIMAD 1997).

Table 3. Radionuclide concentrations in overstory (OS) and understory (US) vegetation collected around the DARHT facility in 1997.

Location	³ H pCi mL ⁻¹	⁹⁰ Sr pCi g ⁻¹ ash	¹⁰¹ U μg g ⁻¹ ash	¹³⁷ Cs pCi g ⁻¹ ash	²³⁸ Pu pCi g ⁻¹ ash	²³⁹ Pu pCi g ⁻¹ ash	²⁴¹ Am pCi g ⁻¹ ash
North							
OS	0.77 (0.71) ¹	0.22 (0.26)	0.99 (0.10)	0.23 (0.35)	0.000 (0.000)	0.005 (0.001)	0.003 (0.001)
US	0.75 (0.71)	0.10 (0.13)	1.74 (0.17)	0.44 (0.66)	-0.000 (0.000)	0.004 (0.001)	-0.001 (0.001)
East							
OS	0.38 (0.68)	0.52 (0.30)	0.65 (0.07)	0.08 (0.12)	-0.000 (0.000)	0.003 (0.001)	0.002 (0.001)
US	0.77 (0.71)	0.35 (0.13)	0.51 (0.05)	0.10 (0.16)	0.000 (0.000)	0.002 (0.000)	0.001 (0.000)
South							
OS	0.84 (0.71)	0.93 (0.32)	0.46 (0.05)	0.05 (0.08)	0.002 (0.001)	0.002 (0.001)	0.004 (0.001)
US	0.66 (0.70)	0.37 (0.15)	0.34 (0.03)	0.40 (0.09)	0.000 (0.000)	0.002 (0.001)	0.002 (0.001)
West							
OS	0.45 (0.69)	0.57 (0.43)	1.06 (0.11)	0.54 (0.81)	-0.001 (0.001)	0.002 (0.001)	0.005 (0.001)
US	0.72 (0.71)	0.11 (0.14)	0.22 (0.02)	-0.02 (1.80)	0.001 (0.000)	0.002 (0.001)	0.001 (0.001)
BG ²							
OS	-0.25 (0.28)	7.9 (1.2)	1.21 (0.10)	0.27 (0.12)	0.025 (0.006)	0.051 (0.009)	0.002 (0.002)
US	0.37 (0.28)	3.0 (0.8)	1.16 (0.11)	0.61 (0.22)	0.001 (0.001)	0.008 (0.003)	0.002 (0.002)
RSRL ³							
OS	1.87	13.3	1.63	1.65	0.038	0.075	0.004
US	1.56	4.1	1.53	0.93	0.005	0.011	0.004

¹(± one counting uncertainty); values are the uncertainty in the analytical results at the 65% level.

²Background from Fresquez et al. (1997b). ²⁴¹Am background from Fresquez et al. (1996c).

³Regional Statistical Reference Level; this is the upper (95%) limit background concentration (mean + 2 std dev) from Fresquez et al. (1997b).

Table 4. Total heavy metal concentrations ($\mu\text{g g}^{-1}$ dry) in overstory (OS) and understory (US) vegetation collected around the DARHT facility in 1997.

Location	Ag	As	Ba	Be	Cd	Cr	Cu	Hg	Ni	Pb	Sb	Se	Tl
North													
OS	0.20 ¹	0.10 ¹	20.0	0.08 ¹	0.15 ¹	0.32	3.4	0.03 ¹	0.5 ¹	1.4	0.4 ¹	0.15 ¹	0.15 ¹
US	0.20 ¹	0.10 ¹	40.0	0.08 ¹	0.15 ¹	0.23	8.1	0.03 ¹	3.2	0.7	0.4 ¹	0.15 ¹	0.15 ¹
East													
OS	0.20 ¹	0.10 ¹	39.0	0.08 ¹	0.15 ¹	0.10 ¹	4.0	0.03 ¹	0.5 ¹	1.4	0.4 ¹	0.15 ¹	0.15 ¹
US	0.20 ¹	0.10 ¹	45.0	0.08 ¹	0.15 ¹	0.10 ¹	7.3	0.03 ¹	0.5 ¹	0.9	0.4 ¹	0.15 ¹	0.15 ¹
South													
OS	0.20 ¹	0.10 ¹	55.0	0.08 ¹	0.15 ¹	0.81	3.0	0.03 ¹	0.5 ¹	1.0	0.4 ¹	0.15 ¹	0.15 ¹
US	0.20 ¹	0.10 ¹	30.0	0.08 ¹	0.15 ¹	0.24	4.5	0.03 ¹	0.5 ¹	0.3	0.4 ¹	0.15 ¹	0.15 ¹
West													
OS	0.20 ¹	0.10 ¹	19.0	0.08 ¹	0.15 ¹	0.20	2.8	0.03 ¹	0.5 ¹	0.4	0.4 ¹	0.15 ¹	0.15 ¹
US	0.20 ¹	0.10 ¹	63.0	0.08 ¹	0.15 ¹	0.57	6.3	0.03 ¹	0.5 ¹	0.2 ¹	0.4 ¹	0.15 ¹	0.15 ¹
BG²													
OS	0.13 ¹	0.10 ¹	32.5	0.06 ¹	0.13 ¹	0.63		0.05 ¹	1.1 ¹	0.4	0.2 ¹	0.20	0.50 ¹
US	0.13 ¹	0.10 ¹	69.0	0.06 ¹	0.25	0.63 ¹	4.8 ⁴	0.05 ¹	1.1 ¹	0.7	0.2 ¹	0.20	0.50 ¹
RSRL³													
OS	0.84	0.10	52.2	0.08	0.26	0.98		0.05	1.7	3.5	0.8	0.29	19.36
US	0.84	0.10	122.0	0.08	0.30	0.98	8.5 ⁴	0.05	1.7	3.2	0.8	3.65	19.36

¹Less than values were reduced by one-half the concentration.

²Background from Fresquez et al. (1997b).

³Regional Statistical Reference Level; this is the upper (95%) limit background concentration (mean + 2 std dev) from Fresquez et al. (1997b).

⁴Background from Fresquez et al. (1990).

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APPENDIX A

ANALYTICAL DATA REPORTS OF RADIONUCLIDE CONCENTRATIONS IN SOILS COLLECTED AROUND THE DARHT FACILITY DURING 1997

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method Area: EH-ALPHA

Submission Id : 100020436

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	CX5030000100	Due Date:	25-AUG-97
Requester Group:	ESH-20	Logged Date:	25-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 SAMPLE

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
H-3 LS ENV	200030547	300094257	N	H-3	520	700	pCi/L	
			N	H-3 MDA	852		pCi/L	
	200030549	300094265	E	H-3	510	700	pCi/L	
			E	H-3 MDA	852		pCi/L	
	200030550	300094275	S	H-3	220	680	pCi/L	
			S	H-3 MDA	852		pCi/L	
	200030551	300094281	W	H-3	250	680	pCi/L	
			W	H-3 MDA	852		pCi/L	
	200030552	300094289	SED-N	H-3	610	700	pCi/L	
			SED-N	H-3 MDA	852		pCi/L	
	200030553	300094297	SED-E	H-3	430	690	pCi/L	
			SED-E	H-3 MDA	852		pCi/L	
	200030554	300094305	SED-SW	H-3	950	720	pCi/L	
			SED-SW	H-3 MDA	852		pCi/L	

DUPLICATE TASKS

None run for this submission

**** FINAL REPORT ****

000011

02-Feb-1998 16:44

Page 2 of 4

Method Area: EH-ALPHA

SAMPLE SPIKES

None run for this submission

Submission Id : 100020436

000012

**** FINAL REPORT ****

A-2

Method Area: EH-ALPHA

Submission Id : 100020436

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

BLIND QC

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>	<u>QC Value</u>	<u>QC Uncertainty</u>	<u>QC units</u>	<u>QC Evaluation</u>
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METHOD BLANKS

None run for this submission

OPEN QC

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>	<u>QC Value</u>	<u>QC Uncertainty</u>	<u>QC units</u>	<u>QC Evaluation</u>
00.35619	300134285	H-3	0.0005	0.0007	uCi/L		0	0	uCi/L	UNDER CONTROL
00.37241	300134286	H-3	0.0149	0.0014	uCi/L		0.01503	0.0015	uCi/L	UNDER CONTROL

A-3

**** FINAL REPORT ****

000013

Method Area: EH-ALPHA

Submission Id : 100020436

Ajp
Analyst

Eief
Review

OB
Team Leader

mag
QA Officer

2/3/98
Date

2/3/98
Date

2/4/98
Date

2/4/98
Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceeding 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 ****

000014.

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method Area: EH-ALPHA

Submission Id : 100020436

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	CX5030000100	Due Date:	25-AUG-97
Requester Group:	ESH-20	Logged Date:	25-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

A-5

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
SR-90 LS ENV	200030547	300094258	N	Sr-90	3.01	1.59	pCi/g	
			N	Sr-90 DL	1.69		pCi/g	
	200030549	300094266	E	Sr-90	1.56	1.33	pCi/g	
			E	Sr-90 DL	1.56		pCi/g	
	200030550	300094276	S	Sr-90	3.41	1.80	pCi/g	
			S	Sr-90 DL	1.98		pCi/g	
	200030551	300094282	W	Sr-90	1.84	1.20	pCi/g	
			W	Sr-90 DL	1.34		pCi/g	
	200030552	300094290	SED-N	Sr-90	1.82	1.10	pCi/g	
			SED-N	Sr-90 DL	1.20		pCi/g	
	200030553	300094298	SED-E	Sr-90	2.23	1.34	pCi/g	
			SED-E	Sr-90 DL	1.44		pCi/g	
	200030554	300094306	SED-SW	Sr-90	0.68	0.57	pCi/g	
			SED-SW	Sr-90 DL	0.65		pCi/g	

DUPLICATE TASKS

Method	Sample Type	Task Id	Original Task	Component	Result Value	Uncertainty	Units	Qualifier
SR-90 LS ENV	Duplicate	300143308	300094266	Sr-90	1.16	0.79	pCi/L	

**** FINAL REPORT ****

Method Area: EH-ALPHA

Submission Id : 100020436

<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>
SR-90 LS ENV	Duplicate	300143308	300094266	Sr-90 DL	0.90		pCi/L	

SAMPLE SPIKES

None run for this submission

**** FINAL REPORT ****

Method Area: EH-ALPHA

Submission Id : 100020436

***** 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>	<u>Qualifier</u>	<u>QC</u> <u>Value</u>	<u>QC</u> <u>Uncertainty</u>	<u>QC</u> <u>units</u>	<u>QC</u> <u>Evaluation</u>
00.36006	300119708	Sr-90	4.81	0.91	pCi/g		3.9	0.12	pCi/g	UNDER CONTROL

METHOD BLANKS

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result</u> <u>Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>	<u>QC</u> <u>Value</u>	<u>QC</u> <u>Uncertainty</u>	<u>QC</u> <u>units</u>	<u>QC</u> <u>Evaluation</u>
00.22776	300143307	Sr-90	0.21	0.53	pCi/g		0.0	0.0	pCi/g	UNDER CONTROL

OPEN QC

None run for this submission

**** FINAL REPORT ****

Method Area: EH-ALPHA

Submission Id : 100020436

Erg
Analyst

CB
Review

CB
Team Leader

NK
QA Officer

3-27-98
Date

3/30/98
Date

3/30/98
Date

03/30/98
Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceeding 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 : 100020436

72909

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	CX5030000100	Due Date:	25-AUG-97
Requester Group:	ESH-20	Logged Date:	25-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

A-9

<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 KPA	200030547	300094259	N	U	4.11	0.41	ug/g	
	200030549	300094267	E	U	1.53	0.15	ug/g	
	200030550	300094269	S	U	1.41	0.14	ug/g	
	200030551	300094283	W	U	2.21	0.22	ug/g	
	200030552	300094291	SED-N	U	5.46	0.55	ug/g	
	200030553	300094299	SED-E	U	4.35	0.44	ug/g	
	200030554	300094307	SED-SW	U	2.18	0.22	ug/g	

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 KPA	Duplicate	300131563	300094267	U	1.46	0.15	ug/g	

SAMPLE SPIKES

None run for this submission

**** FINAL REPORT ****

Method Area: EH-ALPHA

Submission Id : 100020436

70624

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

BLIND QC

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>	<u>QC Value</u>	<u>QC Uncertainty</u>	<u>QC units</u>	<u>QC Evaluation</u>
00.36473	300131450	U	1.21	0.12	ug/g		1.11	0.02	ug/g	UNDER CONTROL

METHOD BLANKS

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>	<u>QC Value</u>	<u>QC Uncertainty</u>	<u>QC units</u>	<u>QC Evaluation</u>
00.22776	300131564	U	0.00	0.01	ug/g		0	0	ug/g	UNDER CONTROL

OPEN QC

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>	<u>QC Value</u>	<u>QC Uncertainty</u>	<u>QC units</u>	<u>QC Evaluation</u>
00.38058	300131562	U	10.25	1.03	ug/L		10.1	1.0	ug/L	UNDER CONTROL

**** FINAL REPORT ****

Method Area: EH-ALPHA

Submission Id: 100020436

70208

OP for MAG
QA Officer

GS
Team Leader

Gu
Review

ml
Analyst

1/25/98
Date

1/23/98
Date

1-2-98
Date

1/14/98
Date

A-11

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-GAMMA

Submission Id : 100020436

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	CX5030000100	Due Date:	25-AUG-97
Requester Group:	ESH-20	Logged Date:	25-JUN-97	Screening Data:	NO SCREENING DATA REQUIRED
Mail Stop:	M887	Study:	ESH20 BIOLOGICALS		
Requester Phone:	667-0815			Logged by:	DDECKER
Requester Fax #:	667-0811	Analytical Service Agreement #:			

CUSTOMER SAMPLES

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC GAMMA	200030547	300094260	N	CS-137	0.13	0.02	pCi/g	
	200030549	300094268	E	CS-137	0.02	0.01	pCi/g	
	200030550	300094270	S	CS-137	0.01	0.02	pCi/g	
	200030551	300094284	W	CS-137	0.05	0.01	pCi/g	
	200030552	300094292	SED-N	CS-137	0.16	0.02	pCi/g	
	200030553	300094300	SED-E	CS-137	0.20	0.03	pCi/g	
	200030554	300094308	SED-SW	CS-137	0.05	0.02	pCi/g	

DUPLICATE TASKS

None run for this submission

SAMPLE SPIKES

None run for this submission

**** FINAL REPORT ****

Method Area: EH-GAMMA

Submission Id : 100020436

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

BLIND QC

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>	<u>QC Value</u>	<u>QC Uncertainty</u>	<u>QC units</u>	<u>QC Evaluation</u>
00.37293	300119714	CS-137	13.5	0.8	pCi/g		11.53	0.36	pCi/g	WARNING 2-3SIG

METHOD BLANKS

A-13

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>	<u>QC Value</u>	<u>QC Uncertainty</u>	<u>QC units</u>	<u>QC Evaluation</u>
00.22776	300134418	CS-137	0.02	0.02	pCi/g		0.0	0.0	pCi/g	UNDER CONTROL

OPEN QC

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>	<u>QC Value</u>	<u>QC Uncertainty</u>	<u>QC units</u>	<u>QC Evaluation</u>
00.33404	300134419	AM-241	5.22	0.40	pCi/g		5.000	0.2200	pCi/g	UNDER CONTROL
00.33404		CS-137	5.32	0.36	pCi/g		4.9800	0.1600	pCi/g	UNDER CONTROL

**** FINAL REPORT ****

Method Area: EH-GAMMA

Submission Id: 100020436

Review

Team Leader

QA Officer

Analyst

2/3/98
Date

2/3/98
Date

2/3/98
Date

A-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 : 100020436

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	CX5030000100	Due Date:	25-AUG-97
Requester Group:	ESH-20	Logged Date:	25-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
A-15 PU RAS ENV	200030547	300094253	N	Pu-238	0.0001	0.0002	pCi/g	
			N	Pu-239	0.0047	0.0008	pCi/g	
			N	Pu-242T Spike	8.27		pCi	
			N	Pu-242T Recovery	88.76		%	
			N	Pu-242T Recovered	7.34		pCi	
	200030549	300094261	E	Pu-238	0.0009	0.0005	pCi/g	
			E	Pu-239	0.0003	0.0003	pCi/g	
			E	Pu-242T Spike	8.27		pCi	
			E	Pu-242T Recovery	88.06		%	
			E	Pu-242T Recovered	7.28		pCi	
	200030550	300094271	S	Pu-238	0.0007	0.0006	pCi/g	
			S	Pu-239	0.0009	0.0006	pCi/g	
			S	Pu-242T Spike	8.27		pCi	
			S	Pu-242T Recovery	41.79		%	
			S	Pu-242T Recovered	3.46		pCi	
	200030551	300094277	W	Pu-238	0.0009	0.0004	pCi/g	
			W	Pu-239	0.0027	0.0007	pCi/g	
			W	Pu-242T Spike	8.27		pCi	
			W	Pu-242T Recovery	88.74		%	

**** FINAL REPORT ****

CC6000

Method Area: EH-ALPHA

Submission Id : 100020436

A-16

<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	200030551	300094277	W	Pu-242T Recovered	7.34		pCi	
	200030552	300094285	SED-N	Pu-238	0.0001	0.0002	pCi/g	
			SED-N	Pu-239	0.0077	0.0011	pCi/g	
			SED-N	Pu-242T Spike	8.27		pCi	
			SED-N	Pu-242T Recovery	94.17		%	
			SED-N	Pu-242T Recovered	7.79		pCi	
	200030553	300094293	SED-E	Pu-238	0.0002	0.0008	pCi/g	
			SED-E	Pu-239	0.0049	0.0014	pCi/g	
			SED-E	Pu-242T Spike	8.27		pCi	
			SED-E	Pu-242T Recovery	88.68		%	
			SED-E	Pu-242T Recovered	7.33		pCi	
	200030554	300094301	SED-SW	Pu-238	0.0007	0.0005	pCi/g	
			SED-SW	Pu-239	0.0018	0.0007	pCi/g	
			SED-SW	Pu-242T Spike	8.27		pCi	
			SED-SW	Pu-242T Recovery	68.50		%	
			SED-SW	Pu-242T Recovered	5.66		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>
PU RAS ENV	Duplicate	300131396	300094253	Pu-238	-0.0002	0.0002	pCi/g	
			300094253	Pu-239	0.0051	0.0010	pCi/g	
			300094253	Pu-242T Spike	8.27		pCi	
			300094253	Pu-242T Recovery	74.62		%	
			300094253	Pu-242T Recovered	6.17		pCi	

**** FINAL REPORT ****

CC6098

Method Area: EH-ALPHA

Submission Id : 100020436

<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-17

**** FINAL REPORT ****

GC1053

Method Area: EH-ALPHA

Submission Id : 100020436

***** 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>	<u>Qualifier</u>	<u>QC</u> <u>Value</u>	<u>QC</u> <u>Uncertainty</u>	<u>QC</u> <u>units</u>	<u>QC</u> <u>Evaluation</u>
00.37198	300119713	Pu-238	0.7701	0.0188	pCi/g		0.76	0.03	pCi/g	UNDER CONTROL
		Pu-239	0.1938	0.0072	pCi/g		0.18	0.01	pCi/g	UNDER CONTROL

METHOD BLANKS

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result</u> <u>Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>	<u>QC</u> <u>Value</u>	<u>QC</u> <u>Uncertainty</u>	<u>QC</u> <u>units</u>	<u>QC</u> <u>Evaluation</u>
00.22776	300131397	Pu-238	0.0010	0.0007	pCi/g		0.0	0.0	pCi/g	UNDER CONTROL
00.22776		Pu-239	0.0009	0.0008	pCi/g		0.0	0.0	pCi/g	UNDER CONTROL

OPEN QC

None run for this submission

**** FINAL REPORT ****

CCCCC

Method Area: EH-ALPHA

Submission Id : 100020436

RJP
Analyst

SVG
Review

SVG for GR
Team Leader

mag
QA Officer

13 JAN 98
Date

1/14/98
Date

1/14/98
Date

1/14/98
Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceeding 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 ****

CC6020

A-19

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method Area: EH-ALPHA

Submission Id : 100020436

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	CX5030000100	Due Date:	25-AUG-97
Requester Group:	ESH-20	Logged Date:	25-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

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
A-20 AM RAS ENV	200030547	300094254	N	Am-241	0.0056	0.0015	pCi/g	
			N	Am-243T Spike	6.08		pCi	
			N	Am-243T Recovery	54.17		%	
			N	Am-243T Recovered	3.29		pCi	
	200030549	300094262	E	Am-241	0.002	0.002	pCi/g	
			E	Am-243T Spike	6.08		pCi	
			E	Am-243T Recovery	51.94		%	
			E	Am-243T Recovered	3.16		pCi	
	200030550	300094272	S	Am-241	0.006	0.008	pCi/g	
			S	Am-243T Spike	6.08		pCi	
			S	Am-243T Recovery	51.13		%	
			S	Am-243T Recovered	3.11		pCi	
	200030551	300094278	W	Am-241	0.0024	0.0011	pCi/g	
			W	Am-243T Spike	6.08		pCi	
			W	Am-243T Recovery	48.78		%	
			W	Am-243T Recovered	2.97		pCi	
	200030552	300094286	SED-N	Am-241	0.0037	0.0015	pCi/g	
			SED-N	Am-243T Spike	6.08		pCi	
			SED-N	Am-243T Recovery	55.75		%	

**** FINAL REPORT ****

000000

Method Area: EH-ALPHA

Submission Id : 100020436

A-21

<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	200030552	300094286	SED-N	Am-243T Recovered	3.39		pCi	
	200030553	300094294	SED-E	Am-241	0.005	0.004	pCi/g	
			SED-E	Am-243T Spike	6.08		pCi	
			SED-E	Am-243T Recovery	56.99		%	
			SED-E	Am-243T Recovered	3.46		pCi	
	200030554	300094302	SED-SW	Am-241	0.0014	0.0007	pCi/g	
			SED-SW	Am-243T Spike	6.08		pCi	
			SED-SW	Am-243T Recovery	61.25		%	
			SED-SW	Am-243T Recovered	3.72		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	300135741	300094254	Am-241	0.0053	0.0014	pCi/g	
	3 6 5 9 7		300094254	Am-243T Spike	6.08		pCi	
			300094254	Am-243T Recovery	52.19		%	
			300094254	Am-243T Recovered	3.17		pCi	

SAMPLE SPIKES

None run for this submission

000000

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

Method Area: EH-ALPHA

Submission Id : 100020436

***** 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>	<u>Qualifier</u>	<u>QC</u> <u>Value</u>	<u>QC</u> <u>Uncertainty</u>	<u>QC</u> <u>units</u>	<u>QC</u> <u>Evaluation</u>
00.37198	300119712	Am-241	0.3778	0.0151	pCi/g		0.36	0.02	pCi/g	UNDER CONTROL

METHOD BLANKS

A-27

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result</u> <u>Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>	<u>QC</u> <u>Value</u>	<u>QC</u> <u>Uncertainty</u>	<u>QC</u> <u>units</u>	<u>QC</u> <u>Evaluation</u>
00.22776	300135742	Am-241	0.0013	0.0008	pCi/g		0.0	0.0	pCi/g	UNDER CONTROL

OPEN QC

None run for this submission

000000

**** FINAL REPORT ****

Method Area: EH-ALPHA

Submission Id : 100020436

12/1/98
Analyst

SB
Review

(S)
Team Leader

OP for MAG
QA Officer

10 Feb 98
Date

2/12/98
Date

2/12/98
Date

2/13/98
Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceeding 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 ****

666020

A-23

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method Area: EH-GAMMA

Submission Id : 100020436

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	CX5030000100	Due Date:	25-AUG-97
Requester Group:	ESH-20	Logged Date:	25-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

A-24

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GROSS ALPHA+BETA	200030547	300094255	N	Alpha	4.4	1.2	pCi/g	
			N	Beta	4.2	1.0	pCi/g	
			N	Alpha MDA	3.0		pCi/g	
			N	Beta MDA	3.0		pCi/g	
	200030549	300094263	E	Alpha	2.3	1.0	pCi/g	
			E	Beta	2.2	0.3	pCi/g	
			E	Alpha MDA	3.0		pCi/g	
			E	Beta MDA	3.0		pCi/g	
	200030550	300094273	S	Alpha	2.7	1.0	pCi/g	
			S	Beta	2.2	0.8	pCi/g	
			S	Alpha MDA	3.1		pCi/g	
			S	Beta MDA	3.0		pCi/g	
	200030551	300094279	W	Alpha	3.9	1.2	pCi/g	
			W	Beta	3.9	1.0	pCi/g	
			W	Alpha MDA	3.0		pCi/g	
			W	Beta MDA	3.0		pCi/g	
	200030552	300094287	SED-N	Alpha	4.7	1.1	pCi/g	
			SED-N	Beta	4.9	1.0	pCi/g	
			SED-N	Alpha MDA	3.0		pCi/g	

**** FINAL REPORT ****

Method Area: EH-GAMMA

Submission Id : 100020436

A-25

<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>
GROSS ALPHA+BETA	200030552	300094287	SED-N	Beta MDA	3.0		pCi/g	
	200030553	300094295	SED-E	Alpha	6.2	1.4	pCi/g	
			SED-E	Beta	5.5	1.0	pCi/g	
			SED-E	Alpha MDA	3.0		pCi/g	
			SED-E	Beta MDA	3.0		pCi/g	
	200030554	300094303	SED-SW	Alpha	3.0	1.4	pCi/g	
			SED-SW	Beta	2.9	0.9	pCi/g	
			SED-SW	Alpha MDA	3.0		pCi/g	
			SED-SW	Beta MDA	3.0		pCi/g	

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>
GROSS ALPHA+BETA	Duplicate	300132607	300094255	Alpha	4.3	1.4	pCi/g	
			300094255	Beta	4.8	1.0	pCi/g	
			300094255	Alpha MDA	3.0		pCi/g	
			300094255	Beta MDA	3.0		pCi/g	

SAMPLE SPIKES

None run for this submission

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

Method Area: EH-GAMMA

Submission Id : 100020436

***** 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>	<u>Qualifier</u>	<u>QC</u> <u>Value</u>	<u>QC</u> <u>Uncertainty</u>	<u>QC</u> <u>units</u>	<u>QC</u> <u>Evaluation</u>
00.36518	300119711	Alpha	8.7	1.6	pCi/g		7.5	.34	pCi/g	UNDER CONTROL
		Beta	5.8	1.0	pCi/g		4.2	.13	pCi/g	UNDER CONTROL

METHOD BLANKS

A-26

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result</u> <u>Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>	<u>QC</u> <u>Value</u>	<u>QC</u> <u>Uncertainty</u>	<u>QC</u> <u>units</u>	<u>QC</u> <u>Evaluation</u>
00.22776	300132608	Alpha	-0.02	0.02	pCi/g		0.0	0.0	pCi/g	UNDER CONTROL
00.22776		Beta	-0.14	1.07	pCi/g		0.0	0.0	pCi/g	UNDER CONTROL

OPEN QC

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result</u> <u>Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>	<u>QC</u> <u>Value</u>	<u>QC</u> <u>Uncertainty</u>	<u>QC</u> <u>units</u>	<u>QC</u> <u>Evaluation</u>
00.35639	300132609	Alpha	11.3	3.4	pCi/L		14.93	0.51	pCi/L	UNDER CONTROL

**** FINAL REPORT ****

8A
529

Method Area: EH-GAMMA

Submission Id : 100020436

yig
Analyst

St Lucia
Review

33
Team Leader

OP for MAC
QA Officer

1/23/98
Date

1/23/98
Date

1/23/98
Date

1/25/98
Date

A-27

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceeding 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-Jan-1998 15:21

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Page 1 of 3

Method Area: EH-GAMMA

Submission Id : 100020436

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	CX5030000100	Due Date:	25-AUG-97
Requester Group:	ESH-20	Logged Date:	25-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
A-208 GROSS GAMMA	200030547	300130552	N	Gamma	5.1	0.5	pCi/g	
	200030549	300130553	E	Gamma	3.3	0.3	pCi/g	
	200030550	300130550	S	Gamma	3.2	0.3	pCi/g	
	200030551	300130554	W	Gamma	3.3	0.3	pCi/g	
	200030552	300130555	SED-N	Gamma	3.2	0.3	pCi/g	
	200030553	300130556	SED-E	Gamma	4.0	0.4	pCi/g	
	200030554	300130551	SED-SW	Gamma	3.1	0.3	pCi/g	

DUPLICATE TASKS

None run for this submission

SAMPLE SPIKES

None run for this submission

**** FINAL REPORT ****

Method Area: EH-GAMMA

Submission Id : 100020436

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

BLIND QC

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>	<u>QC Value</u>	<u>QC Uncertainty</u>	<u>QC units</u>	<u>QC Evaluation</u>
00.34055	300130557	Gamma	12.2	1.2	pCi/g		14.3	0.47	pCi/g	UNDER CONTROL

METHOD BLANKS

A-29

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>	<u>QC Value</u>	<u>QC Uncertainty</u>	<u>QC units</u>	<u>QC Evaluation</u>
00.22776	300131480	Gamma	-0.1	0.2	pCi/g		0.0	0.0	pCi/g	UNDER CONTROL

OPEN QC

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>	<u>QC Value</u>	<u>QC Uncertainty</u>	<u>QC units</u>	<u>QC Evaluation</u>
00.31809	300131481	Gamma	30.8	3.1	pCi/g		28.8800	0.9500	pCi/g	UNDER CONTROL

**** FINAL REPORT ****

Method Area: EH-GAMMA

Submission Id : 100020436

Yig
Analyst

Shanna
Review

SG Fox GB
Team Leader

mag
QA Officer

1/13/98
Date

1/13/98
Date

1/14/98
Date

1/14/98
Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceeding 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 : 100020436

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	CX5030000100	Due Date:	25-AUG-97
Requester Group:	ESH-20	Logged Date:	25-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>
A-31 GENERIC MOISTURE	200030547	300121450	N	MOISTURE	22	1.0	%	
	200030549	300121451	E	MOISTURE	23	1.0	%	
	200030550	300121464	S	MOISTURE	20	1.0	%	
	200030551	300121446	W	MOISTURE	23	1.0	%	
	200030552	300121449	SED-N	MOISTURE	35	2.0	%	
	200030553	300121453	SED-E	MOISTURE	25	1.0	%	
	200030554	300121454	SED-SW	MOISTURE	29	1.0	%	

DUPLICATE TASKS

None run for this submission

SAMPLE SPIKES

None run for this submission

**** FINAL REPORT ****

000012

Method Area: EH-ALPHA

Submission Id : 100020436

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

BLIND QC

None run for this submission

METHOD BLANKS

None run for this submission

OPEN QC

None run for this submission

**** FINAL REPORT ****

000013

A-32

Method Area: EH-ALPHA

Submission Id : 100020436

Ajp
Analyst

Evey
Review

CS
Team Leader

DP for MAG
QA Officer

2/20/1998
Date

2-24-98
Date

2/24/98
Date

2/24/98
Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceeding 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 ****

000014

APPENDIX B

ANALYTICAL DATA REPORTS OF HEAVY METAL CONCENTRATIONS IN SOILS COLLECTED AROUND THE DARHT FACILITY DURING 1997

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

AMENDED

Method Area: EH-OES

Submission Id : 100020439

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	CX5030000100	Due Date:	25-AUG-97
Requester Group:	ESH-20	Logged Date:	25-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				

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC ICPES	200030559	300094311	N	Ag	<2.0000	0	mg/kg	
			N	Ba	119.200	11.900	mg/kg	
			N	Be	0.8300	0.0830	mg/kg	
			N	Cd	<0.9000	0	mg/kg	
			N	Cu	4.6000	1.0000	mg/kg	
			N	Ni	6.7000	4.0000	mg/kg	
			N	Cr	9.9000	0.9900	mg/kg	
	200030560	300094315	E	Ag	<2.0000	0	mg/kg	
			E	Ba	49.0000	4.9000	mg/kg	
			E	Be	0.4800	0.0700	mg/kg	
			E	Cd	<0.9000	0	mg/kg	
			E	Cu	2.2000	1.0000	mg/kg	
			E	Ni	<4.0000	0	mg/kg	
			E	Cr	4.0000	0.9000	mg/kg	
	200030561	300094319	S	Ag	<2.0000	0	mg/kg	
			S	Ba	42.0000	4.2000	mg/kg	
			S	Be	0.4700	0.0700	mg/kg	
			S	Cd	<0.9000	0	mg/kg	
			S	Cu	2.4000	1.0000	mg/kg	
			S	Ni	<4.0000	0	mg/kg	
			S	Cr	4.0000	0.9000	mg/kg	
	200030562	300094323	W	Ag	<2.0000	0	mg/kg	
			W	Ba	101.200	10.100	mg/kg	

**** FINAL REPORT ****

Method Area: EH-OES

Submission Id : 100020439

B-2

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC ICPES	200030562	300094323	W	Be	0.9500	0.0950	mg/kg	
			W	Cd	<0.9000	0	mg/kg	
			W	Cu	6.0000	1.0000	mg/kg	
			W	Ni	7.4000	4.0000	mg/kg	
			W	Cr	9.8000	0.9800	mg/kg	
	200030563	300094327	SED-N	Ag	<2.0000	0	mg/kg	
			SED-N	Ba	101.800	10.100	mg/kg	
			SED-N	Be	0.8100	0.0810	mg/kg	
			SED-N	Cd	<0.9000	0	mg/kg	
			SED-N	Cu	4.4300	1.0000	mg/kg	
			SED-N	Ni	5.6000	4.0000	mg/kg	
			SED-N	Cr	8.000	0.9000	mg/kg	
			SED-E	Ag	<2.0000	0	mg/kg	
	200030564	300094331	SED-E	Ba	116.800	11.700	mg/kg	
			SED-E	Be	1.0500	0.1100	mg/kg	
			SED-E	Cd	<0.9000	0	mg/kg	
			SED-E	Cu	7.860	1.0000	mg/kg	
			SED-E	Ni	6.4000	4.0000	mg/kg	
			SED-E	Cr	10.100	1.0000	mg/kg	
			SED-SW	Ag	8.5000	2.0000	mg/kg	
			SED-SW	Ba	76.9000	7.7000	mg/kg	
	200030565	300094335	SED-SW	Be	0.6300	0.0700	mg/kg	
			SED-SW	Cd	<0.9000	0	mg/kg	
			SED-SW	Cu	4.6000	1.0000	mg/kg	
			SED-SW	Ni	4.70000	4.00	mg/kg	
			SED-SW	Cr	6.9000	0.9000	mg/kg	

DUPLICATE TASKS

None run for this submission

**** FINAL REPORT ****

Method Area: EH-OES

Submission Id : 100020439

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

BLIND QC

None run for this submission

METHOD BLANKS

None run for this submission

OPEN QC

B-3

Customer Id	Task Id	Component	Result		Units	Qualifier	QC		QC	QC	QC
			Value	Uncertainty			Value	Uncertainty		units	Evaluation
00.35928	300102134	Ag	25.0000	2.5000	mg/kg		117	25.2	mg/kg		OUT OF CONTROL
00.35928		Ba	150.0000	15.0000	mg/kg		170	29.3	mg/kg		UNDER CONTROL
00.35928		Be	100.0000	10.0000	mg/kg		120	18.9	mg/kg		UNDER CONTROL
00.35928		Cd	80.0000	8.0000	mg/kg		88.8	14.7	mg/kg		UNDER CONTROL
00.35928		Cr	120.0000	12.0000	mg/kg		133	19.7	mg/kg		UNDER CONTROL
00.35928		Cu	78.0000	7.8000	mg/kg		85	11.3	mg/kg		UNDER CONTROL
00.35928		Ni	88.0000	8.8000	mg/kg		95.5	15.6	mg/kg		UNDER CONTROL
00.35928		Ag	25000	2500	ug/kg		117000	25200	ug/kg		OUT OF CONTROL
00.35928		Ba	150000	15000	ug/kg		170000	29300	ug/kg		UNDER CONTROL
00.35928		Be	100000	10000	ug/kg		120000	18900	ug/kg		UNDER CONTROL
00.35928		Cd	80000	8000	ug/kg		88800	14700	ug/kg		UNDER CONTROL
00.35928		Cr	120000	12000	ug/kg		133000	19700	ug/kg		UNDER CONTROL
00.35928		Cu	78000	7800	ug/kg		85000	11300	ug/kg		UNDER CONTROL
00.35928		Ni	88000	8800	ug/kg		95500	15600	ug/kg		UNDER CONTROL

**** FINAL REPORT ****

Method Area: EH-OES

Submission Id : 100020439

V.D
Analyst

Jmr
Review

R. Don
Team Leader

mag
QA Officer

9/30/97
Date

9/30/97
Date

10/13/97
Date

10/29/97
Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceeding 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-AA

Submission Id : 100020439

Requester Name :	PHIL FRESQUEZ	Customer Cost Code:	CX5030000100	Due Date :	25-AUG-97
Requester Group:	ESH-20	Logged Date :	25-JUN-97	Screening Data :	NO SCREENING DATA REQUIRED
Mail Stop :	M887				
Requester Phone:	667-0815			Logged by:	DDECKER
Requester Fax #:	667-0731	Analytical Service Agreement #:			

6-5

<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 ETVAA	200030559	300095601	N	As	1.96	0.53	mg/kg	
				Se	<0.38		mg/kg	
	200030560	300095602	E	As	0.76	0.25	mg/kg	
				Se	<0.38		mg/kg	
	200030561	300095600	S	As	0.66	0.25	mg/kg	
				Se	<0.38		mg/kg	
	200030562	300095603	W	As	2.88	0.25	mg/kg	
				Se	<0.38		mg/kg	
	200030563	300095604	SED-N	As	1.88	0.25	mg/kg	
				Se	<0.38		mg/kg	
	200030564	300095605	SED-E	As	2.40	0.25	mg/kg	
				Se	<0.38		mg/kg	
	200030565	300095606	SED-SW	As	2.32	0.25	mg/kg	
				Se	<0.38		mg/kg	

DUPLICATE TASKS

None run for this submission

**** FINAL REPORT ****

Method Area: EH-AA

Submission Id : 100020439

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

BLIND QC

None run for this submission

OPEN QC

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result</u> <u>Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>	<u>QC</u> <u>Value</u>	<u>QC</u> <u>Uncertainty</u>	<u>QC</u> <u>units</u>	<u>QC</u> <u>Evaluation</u>
00.30469	300102828	As	139	3	mg/kg		128	71	mg/kg	UNDER CONTROL
		Se	111	8	mg/kg		101	55	mg/kg	UNDER CONTROL
		As	139000	3000	ug/kg		128000	71000	ug/kg	UNDER CONTROL
		Se	111000	8000	ug/kg		101000	55000	ug/kg	UNDER CONTROL

**** FINAL REPORT ****

Method Area: EH-AA

Submission Id : 100020439

K. Doon for MBG

Analyst

HTC

Review

K. Doon

Team Leader

mag

QA Officer

9/2/97

Date

8/12/97

Date

9/2/97

Date

9/3/97

Date

B-7

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceeding 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-IMS

Submission Id : 100020439

Requester Name :	PHIL FRESQUEZ	Customer Cost Code:	CX5030000100	Due Date :	25-AUG-97
Requester Group:	ESH-20	Logged Date :	25-JUN-97	Screening Data :	NO SCREENING DATA REQUIRED
Mail Stop :	M887				
Requester Phone:	667-0815			Logged by:	DDECKER
Requester Fax #:	667-0731	Analytical Service Agreement #:			

13-8

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC ICPMS	200030559	300094310	N	Pb	9.0	0.5	mg/kg	
				Sb	< 0.5	0	mg/kg	
				Tl	< 0.3	0	mg/kg	
	200030560	300094314	E	Pb	4.6	0.3	mg/kg	
				Sb	< 0.5	0	mg/kg	
				Tl	< 0.3	0	mg/kg	
	200030561	300094318	S	Pb	5.2	0.5	mg/kg	
				Sb	< 0.5	0	mg/kg	
				Tl	< 0.3	0	mg/kg	
	200030562	300094322	W	Pb	9.9	0.5	mg/kg	
				Sb	< 0.5	0	mg/kg	
				Tl	< 0.3	0	mg/kg	
	200030563	300094326	SED-N	Pb	8.2	0.5	mg/kg	
				Sb	< 0.5	0	mg/kg	
				Tl	< 0.3	0	mg/kg	
	200030564	300094330	SED-E	Pb	10.2	0.5	mg/kg	
				Sb	< 0.5	0	mg/kg	
				Tl	< 0.3	0	mg/kg	
	200030565	300094334	SED-SW	Pb	7.2	0.5	mg/kg	
				Sb	< 0.5	0	mg/kg	
				Tl	< 0.3	0	mg/kg	

**** FINAL REPORT ****

25-Aug-1997 16:33

Submission Id : 100020439

Method Area: EH-IMS

DUPLICATE TASKS

None run for this submission

B-9

**** FINAL REPORT ****

Method Area: EH-IMS

Submission Id : 100020439

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

BLIND QC

None run for this submission

METHOD BLANKS

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>	<u>QC Value</u>	<u>QC Uncertainty</u>	<u>QC units</u>	<u>QC Evaluation</u>
B-10 00.35510	300108489	Pb	0.5	0.3	mg/kg		0	0	mg/kg	UNDER CONTROL
		Sb	0.5	0.3	mg/kg		0	0	mg/kg	UNDER CONTROL
		Tl	< 0.3	0	mg/kg		0	0	mg/kg	UNDER CONTROL
		Pb	500	300	ug/kg		0	0	ug/kg	UNDER CONTROL
		Sb	500	300	ug/kg		0	0	ug/kg	UNDER CONTROL
		Tl	300	0	ug/kg		0	0	ug/kg	Division by 0

OPEN QC

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>	<u>QC Value</u>	<u>QC Uncertainty</u>	<u>QC units</u>	<u>QC Evaluation</u>
00.35928	300108490	Pb	72	1	mg/kg		86.4	19	mg/kg	UNDER CONTROL
		Sb	2.2	0.5	mg/kg		38.2	24.6	mg/kg	UNDER CONTROL
		Tl	98	3	mg/kg		105	33.2	mg/kg	UNDER CONTROL
		Pb	72000	1000	ug/kg		86400	19000	ug/kg	UNDER CONTROL
		Sb	2200	500	ug/kg		38200	24600	ug/kg	UNDER CONTROL
		Tl	98000	3000	ug/kg		105000	33200	ug/kg	UNDER CONTROL
00.30469	300108491	Pb	140	5	mg/kg		147	73.5	mg/kg	UNDER CONTROL
		Sb	4.5	0.5	mg/kg		43.9	93.5	mg/kg	UNDER CONTROL
		Tl	95	3	mg/kg		102	50.5	mg/kg	UNDER CONTROL
		Pb	140000	5000	ug/kg		147000	73500	ug/kg	UNDER CONTROL
		Sb	4500	500	ug/kg		43900	93500	ug/kg	UNDER CONTROL

**** FINAL REPORT ****

Method Area: EH-IMS

Submission Id : 100020439

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>	<u>QC Value</u>	<u>QC Uncertainty</u>	<u>QC units</u>	<u>QC Evaluation</u>
00.30469	300108491	TI	95000	3000	ug/kg		102000	50500	ug/kg	UNDER CONTROL

B-11

**** FINAL REPORT ****

Method Area: EH-IMS

Submission Id : 100020439

Analyst

Review

Team Leader

QA Officer

Date

Date

Date

Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceeding 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-AA

Submission Id : 100020439

Requester Name :	PHIL FRESQUEZ	Customer Cost Code:	CX5030000100	Due Date :	25-AUG-97
Requester Group:	ESH-20	Logged Date :	25-JUN-97	Screening Data :	NO SCREENING DATA REQUIRED
Mail Stop :	M887				
Requester Phone:	667-0815			Logged by:	DDECKER
Requester Fax #:	667-0731	Analytical Service Agreement #:			

B-13

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC CVAA	200030559	300094312	N	Hg	< 0.05	0	mg/kg	
	200030560	300094316	E	Hg	< 0.05	0	mg/kg	
	200030561	300094320	S	Hg	< 0.05	0	mg/kg	
	200030562	300094324	W	Hg	< 0.05	0	mg/kg	
	200030563	300094328	SED-N	Hg	< 0.05	0	mg/kg	
	200030564	300094332	SED-E	Hg	< 0.05	0	mg/kg	
	200030565	300094336	SED-SW	Hg	< 0.05	0	mg/kg	

DUPLICATE TASKS

Method	Sample Id	Task Id	Original Task	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC CVAA	200037830	300109394	300094312	Hg	< 0.05	0	mg/kg	
	200037831	300109395	300094312	Hg	< 0.05	0	mg/kg	
	200037832	300109396	300094316	Hg	< 0.05	0	mg/kg	
	200037833	300109397	300094316	Hg	< 0.05	0	mg/kg	
	200037834	300109398	300094320	Hg	< 0.05	0	mg/kg	
	200037835	300109399	300094320	Hg	< 0.05	0	mg/kg	
	200037836	300109400	300094324	Hg	< 0.05	0	mg/kg	
	200037837	300109401	300094324	Hg	< 0.05	0	mg/kg	
	200037838	300109402	300094328	Hg	< 0.05	0	mg/kg	
	200037839	300109403	300094328	Hg	< 0.05	0	mg/kg	

**** FINAL REPORT ****

Method Area: EH-AA

Submission Id : 100020439

<u>Method</u>	<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>
GENERIC CVAA	200037840	300109404	300094332	Hg	< 0.05	0	mg/kg	
	200037841	300109405	300094332	Hg	< 0.05	0	mg/kg	
	200037842	300109406	300094336	Hg	< 0.05	0	mg/kg	
	200037843	300109407	300094336	Hg	< 0.05	0	mg/kg	

**** FINAL REPORT ****

B-14

Method Area: EH-AA

Submission Id : 100020439

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

BLIND QC

None run for this submission

METHOD BLANKS

None run for this submission

OPEN QC

B-15

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>	<u>QC Value</u>	<u>QC Uncertainty</u>	<u>QC units</u>	<u>QC Evaluation</u>
00.35928	300109408	Hg	2.04	0.2	mg/kg		2.86	.72	mg/kg	UNDER CONTROL

**** FINAL REPORT ****

Method Area: EH-AA

Submission ID : 100020439

Mark A. Kozell
Analyst

K. L. Q. U.
Review

K. L. Q. U.
Team Leader

mag
QA Officer

8/29/97
Date

8/29/97
Date

9/2/97
Date

9/3/97
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-16

APPENDIX C

ANALYTICAL DATA REPORTS OF RADIONUCLIDE CONCENTRATIONS IN UNDERSTORY AND OVERSTORY VEGETATION COLLECTED AROUND THE DARHT FACILITY DURING 1997

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method Area: EH-ALPHA

Submission Id : 100020888

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	CX5030000100	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		
Requester Phone:	667-0815			Logged by:	DDECKER
Requester Fax #:	667-0731	Analytical Service Agreement #:			

CUSTOMER SAMPLES

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
C-1 H-3 LS ENV	200032329	300098370	N-OS	H-3	770	710	pCi/L	
			N-OS	H-3 MDA	910		pCi/L	
	200032330	300098371	N-US	H-3	750	710	pCi/L	
			N-US	H-3 MDA	910		pCi/L	
	200032331	300098372	E-OS	H-3	380	680	pCi/L	
			E-OS	H-3 MDA	910		pCi/L	
	200032332	300098373	E-US	H-3	770	710	pCi/L	
			E-US	H-3 MDA	910		pCi/L	
	200032333	300098374	S-OS	H-3	840	710	pCi/L	
			S-OS	H-3 MDA	910		pCi/L	
	200032334	300098375	S-US	H-3	660	700	pCi/L	
			S-US	H-3 MDA	910		pCi/L	
	200032335	300098376	W-OS	H-3	450	690	pCi/L	
			W-OS	H-3 MDA	910		pCi/L	
	200032336	300098377	W-US	H-3	720	710	pCi/L	
			W-US	H-3 MDA	910		pCi/L	

DUPLICATE TASKS

None run for this submission

**** FINAL REPORT ****

000003

21-Jan-1998 16:27

Page 2 of 4

Method Area: EH-ALPHA

Submission Id : 100020888

SAMPLE SPIKES

None run for this submission

C-2

000004

**** FINAL REPORT ****

Method Area: EH-ALPHA

Submission Id : 100020888

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

BLIND QC

Customer Id	Task Id	Component	Result Value	Uncertainty	Units	Qualifier	QC Value	QC Uncertainty	QC units	QC Evaluation
00.35818	300098378	H-3	0.0113	0.0012	uCi/L		0.01088	0.0004	uCi/L	UNDER CONTROL

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	300131935	H-3	0.00001	0.00066	uCi/L		0	0	uCi/L	UNDER CONTROL
00.37241	300131936	H-3	0.0139	0.0014	uCi/L		0.01503	0.0015	uCi/L	UNDER CONTROL

500000

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

Method Area: EH-ALPHA

Submission Id : 100020888

Chip
Analyst

BS
Review
for GRC

BS
Team Leader

mag
QA Officer

1/25/98
Date

1/25/98
Date

1/25/98
Date

1/26/98
Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceeding 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 ****

0000006

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method Area: EH-ALPHA

Submission Id : 100020884

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	CX5030000100	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

C-5

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
SR-90 LS ENV	200032311	300098319	N-OS	Sr-90	0.22	0.26	pCi/g	
			N-OS	Sr-90 DL	0.27		pCi/g	
	200032312	300098325	N-US	Sr-90	0.10	0.13	pCi/g	
			N-US	Sr-90 DL	0.16		pCi/g	
	200032313	300098331	E-OS	Sr-90	0.52	0.30	pCi/g	
			E-OS	Sr-90 DL	0.31		pCi/g	
	200032314	300098339	E-US	Sr-90	0.35	0.13	pCi/g	
			E-US	Sr-90 DL	0.13		pCi/g	
	200032315	300098343	S-OS	Sr-90	0.93	0.32	pCi/g	
			S-OS	Sr-90 DL	0.30		pCi/g	
	200032316	300098349	S-US	Sr-90	0.37	0.15	pCi/g	
			S-US	Sr-90 DL	0.16		pCi/g	
	200032317	300098355	W-OS	Sr-90	0.57	0.43	pCi/g	
			W-OS	Sr-90 DL	0.49		pCi/g	
	200032318	300098360	W-US	Sr-90	0.11	0.14	pCi/g	
			W-US	Sr-90 DL	0.17		pCi/g	

DUPLICATE TASKS

None run for this submission

**** FINAL REPORT ****

06-Feb-1998 13:56

Page 2 of 4

Method Area: EH-ALPHA

Submission Id : 100020884

SAMPLE SPIKES

None run for this submission

**** FINAL REPORT ****

C-6

5

Method Area: EH-ALPHA

Submission Id: 100020884

***** 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
00.36198	300098366	Sr-90	-2.81	2.71	pCi/g		5.1	.16		WARNING 2-3SIG

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	300135053	Sr-90	-0.50	1.02	pCi/g		0	0		UNDER CONTROL

OPEN QC

None run for this submission

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

Method Area: EH-ALPHA

Submission Id : 100020884

Erg
Analyst

Erg
Review

ES
Team Leader

Off for mAG
QA Officer

2-10-98
Date

2-10-98
Date

2/10/98
Date

2/18/98
Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceeding 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

40827

Method Area: EH-ALPHA

Submission Id : 100020884

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	CX5030000100	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				

<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>
C-9 GENERIC KPA	200032311	300098317	N-OS	U	0.99	0.10	ug/g	
	200032312	300098323	N-US	U	1.74	0.17	ug/g	
	200032313	300098329	E-OS	U	0.65	0.07	ug/g	
	200032314	300098337	E-US	U	0.51	0.05	ug/g	
	200032315	300098341	S-OS	U	0.46	0.05	ug/g	
	200032316	300098347	S-US	U	0.34	0.03	ug/g	
	200032317	300098353	W-OS	U	1.06	0.11	ug/g	
	200032318	300098358	W-US	U	0.22	0.02	ug/g	

DUPLICATE TASKS

None run for this submission

**** FINAL REPORT ****

Method Area: EH-ALPHA

Submission Id : 100020884

50427

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

BLIND QC

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>	<u>QC Value</u>	<u>QC Uncertainty</u>	<u>QC units</u>	<u>QC Evaluation</u>
00.35016	300098391	U	0.34	0.03	ug/g		.28	.028	ug/g	UNDER CONTROL

METHOD BLANKS

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>	<u>QC Value</u>	<u>QC Uncertainty</u>	<u>QC units</u>	<u>QC Evaluation</u>
00.22784	300113818	U	0.00	0.01	ug/g		0	0	ug/g	UNDER CONTROL

OPEN QC

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>	<u>QC Value</u>	<u>QC Uncertainty</u>	<u>QC units</u>	<u>QC Evaluation</u>
00.37014	300113815	U	10.91	1.09	ug/L		9.8	0.98	ug/L	UNDER CONTROL
00.37013	300113816	U	8.8	0.90	ug/L		8.5	0.85	ug/L	UNDER CONTROL
00.37014	300113817	U	9.38	0.94	ug/L		9.8	0.98	ug/L	UNDER CONTROL

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

Method Area: EH-ALPHA

Submission Id : 100020884

6 of 27

ml
Analyst

Ery
Review

LB
Team Leader

mag
QA Officer

9/29/97 ml
Date

10/2/97
Date

10/2/97
Date

10/9/97
Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceeding 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 ****

C-11

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method Area: EH-GAMMA

Submission Id : 100020884

Requester Name :	PHIL FRESQUEZ	Customer Cost Code:	CX5030000100	Due Date :	15-SEP-97
Requester Group:	ESH-20	Logged Date :	11-JUL-97	Screening Data :	NO SCREENING DATA REQUIRED
Mail Stop :	M887				
Requester Phone:	667-0815			Logged by:	DDECKER
Requester Fax #:	667-0731	Analytical Service Agreement #:			

C-12

<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	200032311	300098316	N-OS	CS-137	0.23	0.35	pCi/g	
	200032312	300098322	N-US	CS-137	0.44	0.66	pCi/g	
	200032313	300098328	E-OS	CS-137	0.08	0.12	pCi/g	
	200032314	300098336	E-US	CS-137	0.10	0.16	pCi/g	
	200032315	300098340	S-OS	CS-137	0.05	0.08	pCi/g	
	200032316	300098346	S-US	CS-137	0.40	0.09	pCi/g	
	200032317	300098352	W-OS	CS-137	0.54	0.81	pCi/g	
	200032318	300098363	W-US	CS-137	-0.02	1.80	pCi/g	

DUPLICATE TASKS

None run for this submission

**** FINAL REPORT ****

Method Area: EH-GAMMA

Submission Id : 100020884

***** 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>	<u>Qualifier</u>	<u>QC</u> <u>Value</u>	<u>QC</u> <u>Uncertainty</u>	<u>QC</u> <u>units</u>	<u>QC</u> <u>Evaluation</u>
00.33991	300098364	CS-137	48.7	4.3	pCi/g		48.5	1.6	pCi/g	UNDER CONTROL

METHOD BLANKS

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result</u> <u>Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>	<u>QC</u> <u>Value</u>	<u>QC</u> <u>Uncertainty</u>	<u>QC</u> <u>units</u>	<u>QC</u> <u>Evaluation</u>
00.22784	300110042	CS-137	0.04	0.05	pCi/g		0	0	pCi/g	UNDER CONTROL

OPEN QC

<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result</u> <u>Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>	<u>QC</u> <u>Value</u>	<u>QC</u> <u>Uncertainty</u>	<u>QC</u> <u>units</u>	<u>QC</u> <u>Evaluation</u>
00.33988	300110043	CS-137	4.39	0.51	pCi/g		4.8000	0.1600	pCi/g	UNDER CONTROL

**** FINAL REPORT ****

Method Area: EH-GAMMA

Submission Id : 100020884

RS
AnalystD. Garcia
ReviewDS
Team Leadermag
QA Officer9/3/97
Date9/3/97
Date9/5/97
Date9/7/97
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 ****

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method Area: EH-ALPHA

Submission Id : 100020884

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	CX5030000100	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

C-15

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
PU RAS ENV	200032311	300098320	N-OS	Pu-238	0.0004	0.0004	pCi/g	
			N-OS	Pu-239	0.0051	0.0009	pCi/g	
			N-OS	Pu-242T Spike	1.95		pCi	
			N-OS	Pu-242T Recovery	86.32		%	
			N-OS	Pu-242T Recovered	1.68		pCi	
			N-OS	Pu-238 Gross Counts	10		counts	
			N-OS	Pu-238 Background Counts	7.0		counts	
			N-OS	Pu-239 Gross Counts	47		counts	
			N-OS	Pu-239 Background Counts	7.2		counts	
			N-OS	Efficiency	31.58		%	
			N-OS	Count Time	3000.00		min	
			N-OS	Analysis Date	12/16/97		MM/DD/YY	
			N-OS	Instrument	ALPHA 32		NONE	
	200032312	300098326	N-US	Pu-238	-0.0001	0.0004	pCi/g	
			N-US	Pu-239	0.0037	0.0006	pCi/g	
			N-US	Pu-242T Spike	1.95		pCi	
			N-US	Pu-242T Recovery	79.87		%	
			N-US	Pu-242T Recovered	1.56		pCi	
			N-US	Pu-238 Gross Counts	14		counts	

**** FINAL REPORT ****

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Method Area: EH-ALPHA

Submission Id : 100020884

C-16

<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	200032312	300098326	N-US	Pu-238 Background Counts	14.6		counts	
			N-US	Pu-239 Gross Counts	49		counts	
			N-US	Pu-239 Background Counts	7.8		counts	
			N-US	Efficiency	29.63		%	
			N-US	Count Time	3000.00		min	
			N-US	Analysis Date	12/16/97		MM/DD/YY	
	200032313	300098332	N-US	Instrument	ALPHA 32		NONE	
			E-OS	Pu-238	-0.0002	0.0003	pCi/g	
			E-OS	Pu-239	0.0034	0.0007	pCi/g	
			E-OS	Pu-242T Spike	1.95		pCi	
			E-OS	Pu-242T Recovery	79.56		%	
			E-OS	Pu-242T Recovered	1.55		pCi	
			E-OS	Pu-238 Gross Counts	4		counts	
			E-OS	Pu-238 Background Counts	5.2		counts	
			E-OS	Pu-239 Gross Counts	29		counts	
			E-OS	Pu-239 Background Counts	3.2		counts	
			E-OS	Efficiency	30.04		%	
			E-OS	Count Time	3000.00		min	
			E-OS	Analysis Date	12/16/97		MM/DD/YY	
			E-OS	Instrument	ALPHA 32		NONE	
	200032314	300098334	E-US	Pu-238	0.0004	0.0002	pCi/g	
			E-US	Pu-239	0.0017	0.0004	pCi/g	
			E-US	Pu-242T Spike	1.95		pCi	
			E-US	Pu-242T Recovery	82.62		%	
			E-US	Pu-242T Recovered	1.61		pCi	
			E-US	Pu-238 Gross Counts	7		counts	
			E-US	Pu-238 Background Counts	2.2		counts	

**** FINAL REPORT ****

Method Area: EH-ALPHA

Submission Id : 100020884

C-17

<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	200032314	300098334	E-US	Pu-239 Gross Counts	25		counts	
			E-US	Pu-239 Background Counts	3.2		counts	
			E-US	Efficiency	30.55		%	
			E-US	Count Time	3000.00		min	
			E-US	Analysis Date	12/16/97		MM/DD/YY	
			E-US	Instrument	ALPHA 32		NONE	
	200032315	300098344	S-OS	Pu-238	0.0015	0.0008	pCi/g	
			S-OS	Pu-239	0.0024	0.0009	pCi/g	
			S-OS	Pu-242T Spike	1.95		pCi	
			S-OS	Pu-242T Recovery	41.86		%	
			S-OS	Pu-242T Recovered	0.82		pCi	
			S-OS	Pu-238 Gross Counts	10		counts	
			S-OS	Pu-238 Background Counts	3.6		counts	
			S-OS	Pu-239 Gross Counts	14		counts	
			S-OS	Pu-239 Background Counts	3.8		counts	
			S-OS	Efficiency	32.39		%	
			S-OS	Count Time	3000.00		min	
			S-OS	Analysis Date	12/16/97		MM/DD/YY	
			S-OS	Instrument	ALPHA 32		NONE	
	200032316	300098350	S-US	Pu-238	0.0002	0.0002	pCi/g	
			S-US	Pu-239	0.0016	0.0005	pCi/g	
			S-US	Pu-242T Spike	1.95		pCi	
			S-US	Pu-242T Recovery	82.58		%	
			S-US	Pu-242T Recovered	1.61		pCi	
			S-US	Pu-238 Gross Counts	5		counts	
			S-US	Pu-238 Background Counts	3.2		counts	
			S-US	Pu-239 Gross Counts	26		counts	

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

8 of 30

Method Area: EH-ALPHA

Submission Id : 100020884

C-18

<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	200032316	300098350	S-US	Pu-239 Background Counts	7.8		counts	
			S-US	Efficiency	30.73		%	
			S-US	Count Time	3000.00		min	
			S-US	Analysis Date	12/16/97		MM/DD/YY	
			S-US	Instrument	ALPHA 32		NONE	
	200032317	300098356	W-OS	Pu-238	-0.0009	0.0010	pCi/g	
			W-OS	Pu-239	0.0023	0.0012	pCi/g	
			W-OS	Pu-242T Spike	1.95		pCi	
			W-OS	Pu-242T Recovery	45.24		%	
			W-OS	Pu-242T Recovered	0.88		pCi	
			W-OS	Pu-238 Gross Counts	5		counts	
			W-OS	Pu-238 Background Counts	7.8		counts	
			W-OS	Pu-239 Gross Counts	13		counts	
			W-OS	Pu-239 Background Counts	6.0		counts	
			W-OS	Efficiency	31.07		%	
			W-OS	Count Time	3000.00		min	
			W-OS	Analysis Date	12/16/97		MM/DD/YY	
			W-OS	Instrument	ALPHA 32		NONE	
	200032318	300098361	W-US	Pu-238	0.0006	0.0004	pCi/g	
			W-US	Pu-239	0.0022	0.0005	pCi/g	
			W-US	Pu-242T Spike	1.95		pCi	
			W-US	Pu-242T Recovery	104.66		%	
			W-US	Pu-242T Recovered	2.04		pCi	
			W-US	Pu-238 Gross Counts	15		counts	
			W-US	Pu-238 Background Counts	8.4		counts	
			W-US	Pu-239 Gross Counts	28		counts	
			W-US	Pu-239 Background Counts	4.8		counts	

**** FINAL REPORT ****

Method Area: EH-ALPHA

Submission Id : 100020884

<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	200032318	300098361	W-US	Efficiency	31.22		%	
			W-US	Count Time	3000.00		min	
			W-US	Analysis Date	12/16/97		MM/DD/YY	
			W-US	Instrument	ALPHA 32		NONE	

DUPLICATE TASKS

None run for this submission

SAMPLE SPIKES

None run for this submission

C-19

**** FINAL REPORT ****

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Method Area: EH-ALPHA

Submission Id : 100020884

***** 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>	<u>Qualifier</u>	<u>QC</u> <u>Value</u>	<u>QC</u> <u>Uncertainty</u>	<u>QC</u> <u>units</u>	<u>QC</u> <u>Evaluation</u>
00.36196	300132801	Pu-238	8.5186	0.3122	pCi/g		8.4	.3	pCi/g	UNDER CONTROL
		Pu-239	4.5244	0.1760	pCi/g		4.5	.14	pCi/g	UNDER CONTROL

METHOD BLANKS

None run for this submission

OPEN QC

None run for this submission

**** FINAL REPORT ****

C-20

Method Area: EH-ALPHA

Submission Id : 100020884

EEA
Analyst

STG
Review

OB
Team Leader

DRP for MAB
QA Officer

1/23/98
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 preceeding 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 ****

12 of 30

C-21

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method Area: EH-ALPHA

Submission Id : 100020884

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	CX5030000100	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>
C-22 AM RAS ENV	200032311	300098321	N-OS	Am-241	0.0027	0.0007	pCi/g	
			N-OS	Am-243T Spike	1.95		pCi	
			N-OS	Am-243T Recovery	90.85		%	
			N-OS	Am-243T Recovered	1.77		pCi	
			N-OS	Am-241 Gross Counts	29		counts	
			N-OS	Am-241 Background Counts	6.8		counts	
			N-OS	Efficiency	31.70		%	
			N-OS	Count Time	3000.00		min	
			N-OS	Analysis Date	01/25/98		MM/DD/YY	
	200032312	300098327	N-OS	Instrument	ALPHA 32	0.0011	NONE	
			N-US	Am-241	-0.0005		pCi/g	
			N-US	Am-243T Spike	1.95		pCi	
			N-US	Am-243T Recovery	28.78		%	
			N-US	Am-243T Recovered	0.56		pCi	
			N-US	Am-241 Gross Counts	13		counts	
			N-US	Am-241 Background Counts	15.0		counts	
			N-US	Efficiency	29.56		%	
			N-US	Count Time	3000.00		min	
			N-US	Analysis Date	01/25/98		MM/DD/YY	

**** FINAL REPORT ****

Method Area: EH-ALPHA

Submission Id : 100020884

C-23

<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	200032312	300098327	N-US	Instrument	ALPHA 32		NONE	
	200032313	300098333	E-OS	Am-241	0.0022	0.0006	pCi/g	
			E-OS	Am-243T Spike	1.95		pCi	
			E-OS	Am-243T Recovery	85.38		%	
			E-OS	Am-243T Recovered	1.66		pCi	
			E-OS	Am-241 Gross Counts	23		counts	
			E-OS	Am-241 Background Counts	5.4		counts	
			E-OS	Efficiency	30.10		%	
			E-OS	Count Time	3000.00		min	
			E-OS	Analysis Date	01/25/98		MM/DD/YY	
	200032314	300098335	E-OS	Instrument	ALPHA 32		NONE	
			E-US	Am-241	0.0009	0.0003	pCi/g	
			E-US	Am-243T Spike	1.95		pCi	
			E-US	Am-243T Recovery	81.97		%	
			E-US	Am-243T Recovered	1.6		pCi	
			E-US	Am-241 Gross Counts	13		counts	
			E-US	Am-241 Background Counts	1.6		counts	
			E-US	Efficiency	30.56		%	
			E-US	Count Time	3000.00		min	
			E-US	Analysis Date	01/25/98		MM/DD/YY	
	200032315	300098345	E-US	Instrument	ALPHA 32		NONE	
			S-OS	Am-241	0.0037	0.0007	pCi/g	
			S-OS	Am-243T Spike	1.95		pCi	
			S-OS	Am-243T Recovery	89.76		%	
			S-OS	Am-243T Recovered	1.75		pCi	
			S-OS	Am-241 Gross Counts	38		counts	
			S-OS	Am-241 Background Counts	4.4		counts	

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

8 of 30

Method Area: EH-ALPHA

Submission Id : 100020884

C-24

<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	200032315	300098345	S-OS	Efficiency	32.36		%	
			S-OS	Count Time	3000.00		min	
			S-OS	Analysis Date	01/25/98		MM/DD/YY	
			S-OS	Instrument	ALPHA 32		NONE	
	200032316	300098351	S-US	Am-241	0.0019	0.0006	pCi/g	
			S-US	Am-243T Spike	1.95		pCi	
			S-US	Am-243T Recovery	56.03		%	
			S-US	Am-243T Recovered	1.09		pCi	
			S-US	Am-241 Gross Counts	19		counts	
			S-US	Am-241 Background Counts	4.2		counts	
			S-US	Efficiency	30.64		%	
			S-US	Count Time	3000.00		min	
			S-US	Analysis Date	01/25/98		MM/DD/YY	
			S-US	Instrument	ALPHA 32		NONE	
	200032317	300098357	W-OS	Am-241	0.0049	0.0012	pCi/g	
			W-OS	Am-243T Spike	1.95		pCi	
			W-OS	Am-243T Recovery	82.89		%	
			W-OS	Am-243T Recovered	1.62		pCi	
			W-OS	Am-241 Gross Counts	35		counts	
			W-OS	Am-241 Background Counts	7.8		counts	
			W-OS	Efficiency	30.81		%	
			W-OS	Count Time	3000.00		min	
			W-OS	Analysis Date	01/25/98		MM/DD/YY	
			W-OS	Instrument	ALPHA 32		NONE	
	200032318	300098362	W-US	Am-241	0.0007	0.0005	pCi/g	
			W-US	Am-243T Spike	1.95		pCi	
			W-US	Am-243T Recovery	77.57		%	

**** FINAL REPORT ****

D A 20

Method Area : EH-ALPHA

Submission Id : 100020884

<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	200032318	300098362	W-US	Am-243T Recovered	1.51		pCi	
			W-US	Am-241 Gross Counts	13		counts	
			W-US	Am-241 Background Counts	8.0		counts	
			W-US	Efficiency	31.19		%	
			W-US	Count Time	3000.00		min	
			W-US	Analysis Date	01/25/98		MM/DD/YY	
			W-US	Instrument	ALPHA 32		NONE	

C-25
DUPLICATE TASKS

None run for this submission

SAMPLE SPIKES

None run for this submission

**** FINAL REPORT ****

10 of 30

Submission Id : 100020884

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>	<u>Qualifier</u>	<u>QC</u> <u>Value</u>	<u>QC</u> <u>Uncertainty</u>	<u>QC</u> <u>units</u> pCi/g	<u>QC</u> <u>Evaluation</u> UNDER CONTROL
00.36196	300132802	Am-241	1.8410	0.0817	pCi/g		1.8	.081		

METHOD BLANKS

None run for this submission

OPEN QC

None run for this submission

C-26

**** FINAL REPORT ****

11 ~ / 20

Method Area: EH-ALPHA

Submission Id : 100020884

CEA
Analyst

Ewp
Review

ES
Team Leader

mag
QA Officer

1/28/98
Date

1-30-98
Date

1/30/98
Date

1/30/98
Date

C-27
No Sample Discrepancies Noted by Sample Management Section

The control status of the preceeding 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 ****

12 of 30

APPENDIX D

ANALYTICAL DATA REPORTS OF HEAVY METAL CONCENTRATIONS IN UNDERSTORY AND OVERSTORY VEGETATION COLLECTED AROUND THE DARHT FACILITY DURING 1997

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method Area: EH-OES

Submission Id : 100021278

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	CX5030000100	Due Date:	22-SEP-97
Requester Group:	ESH-20	Logged Date:	23-JUL-97	Screening Data:	NO SCREENING DATA REQUIRED
Mail Stop:	M887	Study:	ESH20 BIOLOGICALS		
Requester Phone:	667-0815			Logged by:	LBRANCH
Requester Fax #:	667-0731	Analytical Service Agreement #:			

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
D-1 GENERIC ICPES	200033665	300100801	N-OS	Ag	<0.40	0	mg/kg	
			N-OS	Al	130.00	26.65	mg/kg	
			N-OS	Ba	20.00	2.00	mg/kg	
			N-OS	Be	<0.15	0	mg/kg	
			N-OS	Cd	<0.30	0	mg/kg	
			N-OS	Cr	0.32	0.56	mg/kg	
			N-OS	Cu	3.40	0.34	mg/kg	
	200033666	300100805	N-OS	Ni	<0.90	0	mg/kg	
			N-US	Ag	<0.40	0	mg/kg	
			N-US	Al	120.00	12.00	mg/kg	
			N-US	Ba	40.00	4.00	mg/kg	
			N-US	Be	<0.15	0	mg/kg	
			N-US	Cd	<0.30	0	mg/kg	
			N-US	Cr	0.23	0.20	mg/kg	
	200033667	300100809	N-US	Cu	8.10	0.81	mg/kg	
			N-US	Ni	3.20	2.13	mg/kg	
			E-OS	Ag	<0.40	0	mg/kg	
			E-OS	Al	86.00	8.60	mg/kg	
			E-OS	Ba	39.00	3.90	mg/kg	
			E-OS	Be	<0.15	0	mg/kg	
			E-OS	Cd	<0.30	0	mg/kg	
			E-OS	Cr	<0.20	0	mg/kg	
			E-OS	Cu	4.00	0.40	mg/kg	

**** FINAL REPORT ****

Method Area: EH-OES

Submission Id : 100021278

D-2

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC ICPES	200033667	300100809	E-OS	Ni	<0.90	0	mg/kg	
		300100814	E-US	Ag	<0.40	0	mg/kg	
	200033668		E-US	Al	62.00	6.20	mg/kg	
			E-US	Ba	45.00	4.50	mg/kg	
			E-US	Be	<0.15	0	mg/kg	
			E-US	Cd	<0.30	0	mg/kg	
			E-US	Cr	<0.20	0	mg/kg	
			E-US	Cu	7.30	0.73	mg/kg	
			E-US	Ni	<0.90	0	mg/kg	
	200033669	300100817	S-OS	Ag	<0.40	0	mg/kg	
			S-OS	Al	75.00	7.50	mg/kg	
			S-OS	Ba	55.00	5.50	mg/kg	
			S-OS	Be	<0.15	0	mg/kg	
			S-OS	Cd	<0.30	0	mg/kg	
			S-OS	Cr	0.81	0.65	mg/kg	
			S-OS	Cu	3.00	0.30	mg/kg	
			S-OS	Ni	<0.90	0	mg/kg	
	200033670	300100821	S-US	Ag	<0.40	0	mg/kg	
			S-US	Al	21.00	3.65	mg/kg	
			S-US	Ba	30.00	3.00	mg/kg	
			S-US	Be	<0.15	0	mg/kg	
			S-US	Cd	<0.30	0	mg/kg	
			S-US	Cr	0.24	0.27	mg/kg	
			S-US	Cu	4.50	0.45	mg/kg	
			S-US	Ni	<0.90	0	mg/kg	
	200033671	300100825	W-OS	Ag	<0.40	0	mg/kg	
			W-OS	Al	96.00	26.05	mg/kg	
			W-OS	Ba	19.00	1.90	mg/kg	
			W-OS	Be	<0.15	0	mg/kg	
			W-OS	Cd	<0.30	0	mg/kg	
			W-OS	Cr	0.20	0.40	mg/kg	
			W-OS	Cu	2.80	0.28	mg/kg	

**** FINAL REPORT ****

Method Area: EH-OES

Submission Id : 100021278

<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 ICPES	200033671	300100825	W-OS	Ni	<0.90	0	mg/kg	
	200033672	300100828	W-US	Ag	<0.40	0	mg/kg	
			W-US	Al	38.00	3.80	mg/kg	
			W-US	Ba	63.00	6.30	mg/kg	
			W-US	Be	<0.15	0	mg/kg	
			W-US	Cd	<0.30	0	mg/kg	
			W-US	Cr	0.57	1.15	mg/kg	
			W-US	Cu	6.30	0.63	mg/kg	
			W-US	Ni	<0.90	0	mg/kg	

DUPLICATE TASKS

<u>Method</u>	<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>
GENERIC ICPES	200040411	300113166	300100801	Ag	<0.40	0	mg/kg	
		300113166	300100801	Al	110.00	19.16	mg/kg	
		300113166	300100801	Ba	20.00	2.00	mg/kg	
		300113166	300100801	Be	<0.15	0	mg/kg	
		300113166	300100801	Cd	<0.30	0	mg/kg	
		300113166	300100801	Cr	1.90	0.82	mg/kg	
		300113166	300100801	Cu	3.40	0.34	mg/kg	
		300113166	300100801	Ni	<0.90	0	mg/kg	

**** FINAL REPORT ****

Method Area: EH-OES

Submission Id : 100021278

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

BLIND QC

None run for this submission

METHOD BLANKS

None run for this submission

OPEN QC

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<u>Customer Id</u>	<u>Task Id</u>	<u>Component</u>	<u>Result</u> <u>Value</u>	<u>Uncertainty</u>	<u>Units</u>	<u>Qualifier</u>	<u>QC</u> <u>Value</u>	<u>QC</u> <u>Uncertainty</u>	<u>QC</u> <u>units</u>	<u>QC</u> <u>Evaluation</u>
00.00533	300113167	Ag	<0.40	0	mg/kg		0.18	0	mg/kg	UNDER CONTROL
00.00533		Al	350.00	35.00	mg/kg		1000	300	mg/kg	WARNING 2-3SIG
00.00533		Ba	48.00	4.80	mg/kg		57	9	mg/kg	UNDER CONTROL
00.00533		Be	<0.15	0	mg/kg		0.032	0	mg/kg	UNDER CONTROL
00.00533		Cd	1.80	0.30	mg/kg		2.5	0.2	mg/kg	UNDER CONTROL
00.00533		Cr	1.50	0.41	mg/kg		4.5	0.5	mg/kg	OUT OF CONTROL
00.00533		Cu	8.70	0.87	mg/kg		11	1	mg/kg	UNDER CONTROL
00.00533		Ni	<0.90	0	mg/kg		1.3	0.2	mg/kg	UNDER CONTROL

**** FINAL REPORT ****

Method Area: EH-OES

Submission Id : 100021278

JA Henson
Analyst

C. Medina
Review

R. D. Don
Team Leader

mag
QA Officer

9/24/97
Date

9-24-97
Date

9/30/97
Date

10/9/97
Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceeding 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-AA

Submission Id : 100021278

Requester Name :	PHIL FRESQUEZ	Customer Cost Code:	CX5030000100	Due Date :	22-SEP-97
Requester Group:	ESH-20	Logged Date :	23-JUL-97	Screening Data :	NO SCREENING DATA REQUIRED
Mail Stop :	M887				
Requester Phone:	667-0815			Logged by:	LBRANCH
Requester Fax #:	667-0731	Analytical Service Agreement #:			

D-16

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC ETVAA	200033665	300100800	N-OS	As	<0.2		mg/kg	
				Se	<0.3		mg/kg	
	200033666	300100804	N-US	As	<0.2		mg/kg	
				Se	<0.3		mg/kg	
	200033667	300100808	E-OS	As	<0.2		mg/kg	
				Se	<0.3		mg/kg	
	200033668	300100813	E-US	As	<0.2		mg/kg	
				Se	<0.3		mg/kg	
	200033669	300100816	S-OS	As	<0.2		mg/kg	
				Se	<0.3		mg/kg	
	200033670	300100820	S-US	As	<0.2		mg/kg	
				Se	<0.3		mg/kg	
	200033671	300100824	W-OS	As	<0.2		mg/kg	
				Se	<0.3		mg/kg	
	200033672	300100827	W-US	As	<0.2		mg/kg	
				Se	<0.3		mg/kg	

DUPLICATE TASKS

Method	Sample Id	Task Id	Original Task	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC ETVAA	200036514	300106637	300100800	As	<0.2		mg/kg	

**** FINAL REPORT ****

Method Area: EH-AA Submission Id : 100021278

<u>Method</u>	<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>
GENERIC ETVA	200036514	300106637	300100800	Se	<0.3		mg/kg	

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**** FINAL REPORT ****

20-Aug-1997 10:08

Page 3 of 4

Method Area: EH-AA

Submission Id : 100021278

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

BLIND QC

None run for this submission

OPEN QC

None run for this submission

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**** FINAL REPORT ****

1

Method Area: EH-AA

Submission Id : 100021278

Michelle B. Cross
Analyst

[Signature]
Review

[Signature]
Team Leader

mag
QA Officer

8-20-97
Date

8/20/97
Date

9/30/97
Date

10/9/97
Date

D-9

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceeding 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-AA

Submission Id : 100021278

Requester Name:	PHIL FRESQUEZ	Customer Cost Code:	CX5030000100	Due Date:	22-SEP-97
Requester Group:	ESH-20	Logged Date:	23-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				

D-10

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC CVAA	200033665	300100799	N-OS	Hg	< 0.05	0	mg/kg	
	200033666	300100803	N-US	Hg	< 0.05	0	mg/kg	
	200033667	300100807	E-OS	Hg	< 0.05	0	mg/kg	
	200033668	300100812	E-US	Hg	< 0.05	0	mg/kg	
	200033669	300100815	S-OS	Hg	< 0.05	0	mg/kg	
	200033670	300100819	S-US	Hg	< 0.05	0	mg/kg	
	200033671	300100823	W-OS	Hg	< 0.05	0	mg/kg	
	200033672	300100830	W-US	Hg	< 0.05	0	mg/kg	

DUPLICATE TASKS

Method	Sample Id	Task Id	Original Task	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC CVAA	200040610	300113483	300100799	Hg	< 0.05	0	mg/kg	
	200040611	300113484	300100799	Hg	< 0.05	0	mg/kg	
	200040612	300113485	300100803	Hg	< 0.05	0	mg/kg	
	200040613	300113486	300100803	Hg	< 0.05	0	mg/kg	
	200040614	300113487	300100807	Hg	< 0.05	0	mg/kg	
	200040615	300113488	300100807	Hg	< 0.05	0	mg/kg	
	200040616	300113489	300100812	Hg	< 0.05	0	mg/kg	
	200040617	300113490	300100812	Hg	< 0.05	0	mg/kg	
	200040618	300113491	300100815	Hg	< 0.05	0	mg/kg	

**** FINAL REPORT ****

Method Area: EH-AA

Submission Id : 100021278

<u>Method</u>	<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>
GENERIC CVAA	200040619	300113492	300100815	Hg	< 0.05	0	mg/kg	
	200040621	300113493	300100819	Hg	< 0.05	0	mg/kg	
	200040622	300113494	300100823	Hg	< 0.05	0	mg/kg	
	200040623	300113495	300100823	Hg	< 0.05	0	mg/kg	
	200040624	300113496	300100830	Hg	< 0.05	0	mg/kg	
	200040625	300113497	300100830	Hg	< 0.05	0	mg/kg	
	200040630	300113499	300100819	Hg	< 0.05	0	mg/kg	

**** FINAL REPORT ****

Method Area: EH-AA

Submission Id : 100021278

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

BLIND QC

None run for this submission

METHOD BLANKS

None run for this submission

OPEN QC

None run for this submission

**** FINAL REPORT ****

D-12

Method Area: EH-AA

Submission Id : 100021278

Mark A. Keggell
Analyst

C. J. J. J.
Review

R. D. D.
Team Leader

mag
QA Officer

9/30/97
Date

9-30-97
Date

9/30/97
Date

10/9/97
Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceeding 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-IMS

Submission Id : 100021278

Requester Name :	PHIL FRESQUET	Customer Cost Code:	CX5030000100	Due Date :	22-SEP-97
Requester Group:	ESH-20	Logged Date :	23-JUL-97	Screening Data :	NO SCREENING DATA REQUIRED
Mail Stop :	M887				
Requester Phone:	667-0815			Logged by:	LBRANCH
Requester Fax #:	667-0731	Analytical Service Agreement #:			

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Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC ICPMS	200033665	300100802	N-OS	Pb	1.4	0.3	mg/kg	
	200033665			Sb	< 0.7	0	mg/kg	
	200033665			Tl	< 0.3	3	mg/kg	
	200033666	300100806	N-US	Pb	0.7	0.3	mg/kg	
	200033666			Sb	< 0.7	0	mg/kg	
	200033666			Tl	< 0.3	0	mg/kg	
	200033667	300100810	E-OS	Pb	1.4	0.3	mg/kg	
	200033667			Sb	< 0.7	0	mg/kg	
	200033667			Tl	< 0.3	0	mg/kg	
	200033668	300100811	E-US	Pb	0.9	0.3	mg/kg	
	200033668			Sb	< 0.7	0	mg/kg	
	200033668			Tl	< 0.3	0	mg/kg	
	200033669	300100818	S-OS	Pb	1.0	0.3	mg/kg	
	200033669			Sb	< 0.7	0	mg/kg	
	200033669			Tl	< 0.3	0	mg/kg	
	200033670	300100822	S-US	Pb	0.3	0.3	mg/kg	
	200033670			Sb	< 0.7	0	mg/kg	
	200033670			Tl	< 0.3	0	mg/kg	
	200033671	300100826	W-OS	Pb	0.4	0.3	mg/kg	
	200033671			Sb	< 0.7	0	mg/kg	
	200033671			Tl	< 0.3	0	mg/kg	
	200033672	300100829	W-US	Pb	< 0.3	0	mg/kg	
	200033672			Sb	< 0.7	0	mg/kg	

**** FINAL REPORT ****

Method Area: EH-IMS

Submission Id : 100021278

<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 ICPMS	200033672	300100829	W-US	Tl	< 0.3	0	mg/kg	

DUPLICATE TASKS

<u>Method</u>	<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>
GENERIC ICPMS	200037799	300109339	300100802	Pb	1.7	0.3	mg/kg	
		300109339	300100802	Sb	< 0.7	0	mg/kg	
		300109339	300100802	Tl	< 0.3	0	mg/kg	

**** FINAL REPORT ****

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Method Area: EH-IMS

Submission Id : 10021278

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

BLIND QC

None run for this submission

METHOD BLANKS

None run for this submission

OPEN QC

Customer Id	Task Id	Component	Result	Uncertainty	Units	Qualifier	QC Value	QC Uncertainty	QC units	QC Evaluation
00.00533	300109341	Pb	Value 4.8	0.3	mg/kg		6.3	0.3	mg/kg	OUT OF CONTROL

D-16

**** FINAL REPORT ****

Method Area: EH-IMS

Submission Id : 100021278

W. Lee
Analyst

C. J. J. J.
Review

B. L. Dorn
Team Leader

mag
QA Officer

9/8/97
Date

9-8-97
Date

9/30/97
Date

10/9/97
Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceeding 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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