Attachment 3

(DOT (Excel 97) Spreadsheets used to calculate data for Options 1 & 2)

Container ID # **INEEL V-1 solid and liquid contents whole tank**

Constants	Units
3.70E+10	Bq/Ci
453.6	g/lb
1.00E-12	TBq/Bq or Ci/pCi
1000.00	g/kg
1.00E+09	nCi/Ci

Section I. Waste Stream Information

Container Type: V-1 Tank Form# N/A NTS Waste Stream # N/A
Description: Homogenous mix PKE# N/A SNL Waste Stream# N/A

Container Gross Wt (lb)	Container Gross Wt (kg)	Container Tare Wt (lb)	Container Tare Wt (kg)	Waste Net Wt (kg)	External Vol. (m3)	Est. Waste Vol. (m3)
13893.00	6301.86	0.00	0.00	6301.86	40.030	6.375

Gross Wt (lb) estimated for contents only at 1684 gal @ 8.25 lb/gal -> 13,893 lbs.

Dose rates from *MicroShield v5.01*: 942 mR/hr on contact and 51.8 mR/hr at 1 meter.
Dose survey from Sxxxxx on xx/xx/00 shows 942 mrem/hr OC.
Radioactive liquid effluents from hot cells, labs, and decon facilities at TAN and IETF.
EPA regulated hazardous COCs: Barium, Cadmium, Chromium, Lead, Mercury, Silver, VOCs, SVOCs, and PCBs.

Section II. List the radionuclides and activities; perform DOT RAM, RQ, LTD QTY, and Type A Packaging checks

Nuclide	Activity (Ci)	% of Total A2 Fraction	Activity (Bq)	Activity/gram (Bq/gram)	RQ limits (TBq)	RQ Ratios (amount/limit)	A2 Value (TBq)	LTD QTY Det. (amount/(10-4)A2)	Type A Pkg? (amount/A2)	DOT Fissile Mass (g)	TRU Conc. (nCi/g)	LSA-II Liquids Fraction	Activity/gram (pCi/g)
Cs-137	1.77E+01	4.60E+00	6.55E+11	1.04E+05	3.70E-02	1.77E+01	5.00E-01	1.31E+04	1.31E+00	0.00E+00	0.00E+00	2.08E-02	2.81E+06
Sr-90	1.55E+01	2.01E+01	5.73E+11	9.09E+04	3.70E-03	1.55E+02	1.00E-01	5.73E+04	5.73E+00	0.00E+00	0.00E+00	9.09E-02	2.46E+06
Ni-63	3.38E+00	1.46E-02	1.25E+11	1.98E+04	3.70E+00	3.38E-02	3.00E+01	4.16E+01	4.16E-03	0.00E+00	0.00E+00	6.61E-05	5.36E+05
Co-60	4.88E-01	1.59E-01	1.81E+10	2.87E+03	3.70E-01	4.88E-02	4.00E-01	4.52E+02	4.52E-02	0.00E+00	0.00E+00	7.17E-04	7.75E+04
Pu-241	4.09E-01	5.32E+00	1.51E+10	2.40E+03	3.70E-02	4.09E-01	1.00E-02	1.51E+04	1.51E+00	4.09E-03	0.00E+00	2.40E-02	6.49E+04
H-3	1.34E-01	4.35E-04	4.96E+09	7.86E+02	3.70E+00	1.34E-03	4.00E+01	1.24E+00	1.24E-04	0.00E+00	0.00E+00	1.97E-06	2.13E+04
Eu-154	9.53E-02	2.48E-02	3.53E+09	5.60E+02	3.70E-01	9.53E-03	5.00E-01	7.05E+01	7.05E-03	0.00E+00	0.00E+00	1.12E-04	1.51E+04
Eu-152	7.09E-02	1.02E-02	2.62E+09	4.16E+02	3.70E-01	7.09E-03	9.00E-01	2.91E+01	2.91E-03	0.00E+00	0.00E+00	4.62E-05	1.12E+04
Am-241	4.30E-02	2.79E+01	1.59E+09	2.52E+02	3.70E-04	4.30E+00	2.00E-04	7.95E+04	7.95E+00	0.00E+00	6.82E+00	1.26E-01	6.82E+03
Pu-238	3.83E-02	2.49E+01	1.42E+09	2.25E+02	3.70E-04	3.83E+00	2.00E-04	7.08E+04	7.08E+00	2.25E-03	6.07E+00	1.12E-01	6.07E+03
Ru-103	3.75E-02	5.42E-03	1.39E+09	2.20E+02	3.70E-01	3.75E-03	9.00E-01	1.54E+01	1.54E-03	0.00E+00	0.00E+00	2.45E-05	5.95E+03
Ru-106	3.04E-02	1.97E-02	1.12E+09	1.78E+02	3.70E-02	3.04E-02	2.00E-01	5.62E+01	5.62E-03	0.00E+00	0.00E+00	8.92E-05	4.82E+03
Ce-144	2.59E-02	1.69E-02	9.60E+08	1.52E+02	3.70E-02	2.59E-02	2.00E-01	4.80E+01	4.80E-03	0.00E+00	0.00E+00	7.61E-05	4.12E+03
Pu-239	1.74E-02	1.13E+01	6.46E+08	1.02E+02	3.70E-04	1.74E+00	2.00E-04	3.23E+04	3.23E+00	2.81E-01	2.77E+00	5.12E-02	2.77E+03
Cm-244	1.27E-02	4.12E+00	4.69E+08	7.44E+01	3.70E-04	1.27E+00	4.00E-04	1.17E+04	1.17E+00	0.00E+00	0.00E+00	1.86E-02	2.01E+03
Sb-125	1.23E-02	1.77E-03	4.54E+08	7.20E+01	3.70E-01	1.23E-03	9.00E-01	5.04E+00	5.04E-04	0.00E+00	0.00E+00	8.00E-06	1.95E+03
U-233	1.06E-02	1.38E+00	3.93E+08	6.24E+01	3.70E-03	1.06E-01	1.00E-03	3.93E+03	3.93E-01	1.10E+00	0.00E+00	6.24E-03	1.69E+03
Nb-95	1.00E-02	1.30E-03	3.71E+08	5.88E+01	3.70E-01	1.00E-03	1.00E+00	3.71E+00	3.71E-04	0.00E+00	0.00E+00	5.88E-06	1.59E+03
Zr-95	8.85E-03	1.28E-03	3.27E+08	5.19E+01	3.70E-01	8.85E-04	9.00E-01	3.64E+00	3.64E-04	0.00E+00	0.00E+00	5.77E-06	1.40E+03
Eu-155	8.84E-03	5.75E-04	3.27E+08	5.19E+01	3.70E-01	8.84E-04	2.00E+00	1.64E+00	1.64E-04	0.00E+00	0.00E+00	2.60E-06	1.40E+03
Co-58	4.55E-03	5.92E-04	1.68E+08	2.67E+01	3.70E-01	4.55E-04	1.00E+00	1.68E+00	1.68E-04	0.00E+00	0.00E+00	2.67E-06	7.23E+02
Zn-65	4.10E-03	2.66E-04	1.52E+08	2.40E+01	3.70E-01	4.10E-04	2.00E+00	7.58E-01	7.58E-05	0.00E+00	0.00E+00	1.20E-06	6.50E+02
Ag-110m	3.91E-03	1.27E-03	1.45E+08	2.30E+01	3.70E-01	3.91E-04	4.00E-01	3.62E+00	3.62E-04	0.00E+00	0.00E+00	5.74E-06	6.21E+02
Cs-134	3.13E-03	8.14E-04	1.16E+08	1.84E+01	3.70E-02	3.13E-03	5.00E-01	2.32E+00	2.32E-04	0.00E+00	0.00E+00	3.68E-06	4.97E+02
Ag-108m	2.22E-03	4.82E-04	8.23E+07	1.31E+01	3.70E-01	2.22E-04	6.00E-01	1.37E+00	1.37E-04	0.00E+00	0.00E+00	2.18E-06	3.53E+02
Mn-54	1.63E-03	2.12E-04	6.03E+07	9.57E+00	3.70E-01	1.63E-04	1.00E+00	6.03E-01	6.03E-05	0.00E+00	0.00E+00	9.57E-07	2.59E+02
Ra-226	1.22E-03	7.91E-03	4.50E+07	7.15E+00	3.70E-03	1.22E-02	2.00E-02	2.25E+01	2.25E-03	0.00E+00	0.00E+00	3.57E-05	1.93E+02
U-235	3.22E-04	0.00E+00	1.19E+07	1.89E+00	3.70E-03	3.22E-03	Unlimited	0.00E+00	0.00E+00	1.47E+02	0.00E+00	0.00E+00	5.12E+01
U-238	1.75E-04	0.00E+00	6.47E+06	1.03E+00	3.70E-03	1.75E-03	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.78E+01
Th-234	1.75E-04	1.14E-04	6.47E+06	1.03E+00	3.70E+00	1.75E-06	2.00E-01	3.24E-01	3.24E-05	0.00E+00	0.00E+00	5.14E-07	2.78E+01
Cm-242	1.50E-04	1.95E-03	5.56E+06	8.83E-01	3.70E-02	1.50E-04	1.00E-02	5.56E+00	5.56E-04	0.00E+00	0.00E+00	8.83E-06	2.39E+01
I-129	1.38E-04	0.00E+00	5.10E+06	8.09E-01	3.70E-05	1.38E-01	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.19E+01
Np-237	5.36E-05	3.48E-02	1.98E+06	3.15E-01	3.70E-04	5.36E-03	2.00E-04	9.92E+01	9.92E-03	0.00E+00	8.51E-03	1.57E-04	8.51E+00
Pa-233	5.36E-05	7.74E-06	1.98E+06	3.15E-01	3.70E+00	5.36E-07	9.00E-01	2.20E-02	2.20E-06	0.00E+00	0.00E+00	3.50E-08	8.51E+00
Total	3.80E+01	100.00%	1.41E+12	2.23E+05		1.85E+02		2.85E+05	2.85E+01	1.48E+02	1.57E+01	4.52E-01	6.03E+06

DOT regulated as Hazard Class 7 Radioactive Material
Contains a Reportable Quantity of a Hazardous Substance; use 'RQ(radionuclides)' as part of PSN
> Type A quantity; requires Type B Packaging
Does NOT meet LTD QTY Exception; Check if LSA
Meets Low Specific Activity (LSA)-II material - Check <Type A quantity and use Radioactive material, LSA, n.o.s. as PSN
>15 grams Fissile Material - use Radioactive material, fissile material, n.o.s. as PSN
This is a Low-level waste

Performed by: Gordon Harris Date: 9/25/01

Reviewed by: _____ Date: _____

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Section III: Check radionuclides for listing on labels and shipping papers

Nuclide	Activity (Ci)	% of Total A2 Fraction	Cumulative A2 Fraction
Am-241	4.30E-02	2.79E+01	2.79E+01
Pu-238	3.83E-02	2.49E+01	5.28E+01
Sr-90	1.55E+01	2.01E+01	7.29E+01
Pu-239	1.74E-02	1.13E+01	8.43E+01
Pu-241	4.09E-01	5.32E+00	8.96E+01
Cs-137	1.77E+01	4.60E+00	9.42E+01
Cm-244	1.27E-02	4.12E+00	9.83E+01
U-233	1.06E-02	1.38E+00	9.97E+01
Co-60	4.88E-01	1.59E-01	9.99E+01
Np-237	5.36E-05	3.48E-02	9.99E+01
Eu-154	9.53E-02	2.48E-02	9.99E+01
Ru-106	3.04E-02	1.97E-02	9.99E+01
Ce-144	2.59E-02	1.69E-02	1.00E+02
Ni-63	3.38E+00	1.46E-02	1.00E+02
Eu-152	7.09E-02	1.02E-02	1.00E+02
Ra-226	1.22E-03	7.91E-03	1.00E+02
Ru-103	3.75E-02	5.42E-03	1.00E+02
Cm-242	1.50E-04	1.95E-03	1.00E+02
Sb-125	1.23E-02	1.77E-03	1.00E+02
Nb-95	1.00E-02	1.30E-03	1.00E+02
Zr-95	8.85E-03	1.28E-03	1.00E+02
Ag-110m	3.91E-03	1.27E-03	1.00E+02
Cs-134	3.13E-03	8.14E-04	1.00E+02
Co-58	4.55E-03	5.92E-04	1.00E+02
Eu-155	8.84E-03	5.75E-04	1.00E+02
Ag-108m	2.22E-03	4.82E-04	1.00E+02
H-3	1.34E-01	4.35E-04	1.00E+02
Zn-65	4.10E-03	2.66E-04	1.00E+02
Mn-54	1.63E-03	2.12E-04	1.00E+02
Th-234	1.75E-04	1.14E-04	1.00E+02
Pa-233	5.36E-05	7.74E-06	1.00E+02
U-235	3.22E-04	0.00E+00	1.00E+02
U-238	1.75E-04	0.00E+00	1.00E+02
I-129	1.38E-04	0.00E+00	1.00E+02

Nuclide	Activity (Ci)	% of Total Activity	Activity Conc. (pCi/g)	Source Material (kg)	SNM (g)		Activity Conc. (Ci/m3)
	1.77E+01	4.65E+01	2.81E+06	Not applicable	Not applicable		2.78E+00
	1.55E+01	4.07E+01	2.46E+06	Not applicable	Not applicable		2.43E+00
Ni-63	3.38E+00	8.88E+00	5.36E+05	Not applicable	Not applicable	2.44E-01	5.30E-01
	4.88E-01	1.28E+00	7.75E+04	Not applicable	Not applicable		7.66E-02
Pu-241	4.09E-01	1.08E+00	6.49E+04	Not applicable	4.09E-03	1.86E-01	6.42E-02
H-3	1.34E-01	3.52E-01	2.13E+04	Not applicable	Not applicable	8.50E-04	2.10E-02
Eu-154	9.53E-02	2.51E-01	1.51E+04	Not applicable	Not applicable	5.04E-01	1.50E-02
Eu-152	7.09E-02	1.86E-01	1.12E+04	Not applicable	Not applicable	5.62E-01	1.11E-02
Am-241	4.30E-02	1.13E-01	6.82E+03	Not applicable	Not applicable	6.82E-01	6.74E-03
Pu-238	3.83E-02	1.01E-01	6.07E+03	Not applicable	2.25E-03	6.07E-01	6.00E-03
Ru-103	3.75E-02	9.87E-02	5.95E+03	Not applicable	Not applicable	#DIV/0!	5.89E-03
Ru-106	3.04E-02	7.99E-02	4.82E+03	Not applicable	Not applicable	#DIV/0!	4.77E-03
Ce-144	2.59E-02	6.82E-02	4.12E+03	Not applicable	Not applicable	#DIV/0!	4.07E-03
Pu-239	1.74E-02	4.59E-02	2.77E+03	Not applicable	2.81E-01	2.77E-01	2.74E-03
Cm-244	1.27E-02	3.33E-02	2.01E+03	Not applicable	Not applicable	2.01E-01	1.99E-03
Sb-125	1.23E-02	3.23E-02	1.95E+03	Not applicable	Not applicable	#DIV/0!	1.92E-03
U-233	1.06E-02	2.80E-02	1.69E+03	Not applicable	1.10E+00	2.25E-02	1.67E-03
Nb-95	1.00E-02	2.63E-02	1.59E+03	Not applicable	Not applicable	#DIV/0!	1.57E-03
Zr-95	8.85E-03	2.33E-02	1.40E+03	Not applicable	Not applicable	#DIV/0!	1.39E-03
Eu-155	8.84E-03	2.32E-02	1.40E+03	Not applicable	Not applicable	3.19E-06	1.39E-03
Co-58	4.55E-03	1.20E-02	7.23E+02	Not applicable	Not applicable	#DIV/0!	7.14E-04
Zn-65	4.10E-03	1.08E-02	6.50E+02	Not applicable	Not applicable	#DIV/0!	6.42E-04
Ag-110m	3.91E-03	1.03E-02	6.21E+02	Not applicable	Not applicable	#DIV/0!	6.14E-04
Cs-134	3.13E-03	8.23E-03	4.97E+02	Not applicable	Not applicable	1.13E-06	4.91E-04
Ag-108m	2.22E-03	5.85E-03	3.53E+02	Not applicable	Not applicable	7.06E-03	3.49E-04
Mn-54	1.63E-03	4.29E-03	2.59E+02	Not applicable	Not applicable	#DIV/0!	2.56E-04
Ra-226	1.22E-03	3.20E-03	1.93E+02	Not applicable	Not applicable	#DIV/0!	1.91E-04
U-235	3.22E-04	8.48E-04	5.12E+01	Not applicable	1.47E+02	2.69E-02	5.06E-05
U-238	1.75E-04	4.60E-04	2.78E+01	Not applicable	Not applicable	8.41E-05	2.74E-05
Th-234	1.75E-04	4.60E-04	2.78E+01	Not applicable	Not applicable	#DIV/0!	2.74E-05
Cm-242	1.50E-04	3.95E-04	2.39E+01	Not applicable	Not applicable	1.19E-05	2.36E-05
I-129	1.38E-04	3.62E-04	2.19E+01	Not applicable	Not applicable	7.05E-03	2.16E-05
Np-237	5.36E-05	1.41E-04	8.51E+00	Not applicable	Not applicable	8.51E-04	8.41E-06
Pa-233	5.36E-05	1.41E-04	8.51E+00	Not applicable	Not applicable	#DIV/0!	8.41E-06

"#DIV/0!" occurring in the Fraction of the Rad Mat License indicates a nuclide not specifically listed in the Envirocare Radioactive Material License but is exempt as a short-lived decay product when it's concentration is equal to the parent.

Waste Classification Determination for near surface disposal per 10 CFR §61.55

Assume that Sr-90, Cs-137, and Ni-63 are major nuclides driving waste classification determination for Tank V-1, V-2, and V-3 wastes

Radionuclide	Table 2 limit (Ci/m^3) Column 1	Column 2	V-1 Tank
Cs-137	1	44	2.78E+00
Sr-90	0.04	150	2.43E+00
Ni-63	3.5	70	5.30E-01

Class A Sum of Fractions: 63.66
Class B Sum of Fractions: 0.09
Class B

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Container ID # **INEEL V-1 solid and liquid contents (7.5 gal) + clean soil (511.0 gal [2.53 yd^3])**
Note: HIC Liner capacity is 804.9 gallons; assume 64.3% full to meet liner max load limit of 7500 lbs.

Constants	Units
3.70E+10	Bq/Ci
453.6	g/lb
1.00E-12	TBq/Bq or Ci/pCi
1000.00	g/kg
1.00E+09	nCi/Ci

Section I. Waste Stream Information

Container Type: HIC Liner PL8-120 MT Form# N/A
Description: Homogenous mix + soil PKE# N/A

NTS Waste Stream # N/A
SNL Waste Stream# N/A

Container Gross Wt (lb)	Container Gross Wt (kg)	Container Tare Wt (lb)	Container Tare Wt (kg)	Waste Net Wt (kg)	External Vol. (m3)	Est. Waste Vol. (m3)
7484.20	3394.83	600.00	272.16	3122.67	3.427	1.963

Gross Wt (lb) estimated at 7.5 gal of waste @ 8.25 lb/gal plus 511.0 gal of soil @ 13.351 lb./gal plus tare weight = 7484 lbs.

Dose rates from *MicroShield v5.01* : 942 mR/hr on contact and 51.8 mR/hr at 1 meter.
Dose survey from Sxxxxx on xx/xx/00 shows 942 mrem/hr OC.
Radioactive liquid effluents from hot cells, labs, and decon facilities at TAN and IETF.
EPA regulated hazardous COCs: Barium, Cadmium, Chromium, Lead, Mercury, Silver, VOCs, SVOCs, and PCBs.

Section II. List the radionuclides and activities; perform DOT RAM, RQ, LTD QTY, and Type A Packaging checks

Nuclide	Activity (Ci)	% of Total A2 Fraction	Activity (Bq)	Activity/gram (Bq/gram)	RQ limits (TBq)	RQ Ratios (amount/limit)	A2 Value (TBq)	LTD QTY Det. (amount/(10-4)A2)	Type A Pkg? (amount/A2)	DOT Fissile Mass (g)	TRU Conc. (nCi/g)	LSA-II Liquids Fraction	Activity/gram (pCi/g)
Cs-137	7.88E-02	4.60E+00	2.92E+09	9.34E+02	3.70E-02	7.88E-02	5.00E-01	5.83E+01	5.83E-03	0.00E+00	0.00E+00	1.87E-04	2.52E+04
Sr-90	6.90E-02	2.01E+01	2.55E+09	8.17E+02	3.70E-03	6.90E-01	1.00E-01	2.55E+02	2.55E-02	0.00E+00	0.00E+00	8.17E-04	2.21E+04
Ni-63	1.50E-02	1.46E-02	5.56E+08	1.78E+02	3.70E+00	1.50E-04	3.00E+01	1.85E-01	1.85E-05	0.00E+00	0.00E+00	5.94E-07	4.82E+03
Co-60	2.18E-03	1.59E-01	8.05E+07	2.58E+01	3.70E-01	2.18E-04	4.00E-01	2.01E+00	2.01E-04	0.00E+00	0.00E+00	6.44E-06	6.97E+02
Pu-241	1.82E-03	5.32E+00	6.74E+07	2.16E+01	3.70E-02	1.82E-03	1.00E-02	6.74E+01	6.74E-03	1.82E-05	0.00E+00	2.16E-04	5.83E+02
H-3	5.97E-04	4.35E-04	2.21E+07	7.07E+00	3.70E+00	5.97E-06	4.00E+01	5.52E-03	5.52E-07	0.00E+00	0.00E+00	1.77E-08	1.91E+02
Eu-154	4.25E-04	2.48E-02	1.57E+07	5.03E+00	3.70E-01	4.25E-05	5.00E-01	3.14E-01	3.14E-05	0.00E+00	0.00E+00	1.01E-06	1.36E+02
Eu-152	3.16E-04	1.02E-02	1.17E+07	3.74E+00	3.70E-01	3.16E-05	9.00E-01	1.30E-01	1.30E-05	0.00E+00	0.00E+00	4.15E-07	1.01E+02
Am-241	1.91E-04	2.79E+01	7.08E+06	2.27E+00	3.70E-04	1.91E-02	2.00E-04	3.54E+02	3.54E-02	0.00E+00	6.13E-02	1.13E-03	6.13E+01
Pu-238	1.70E-04	2.49E+01	6.31E+06	2.02E+00	3.70E-04	1.70E-02	2.00E-04	3.15E+02	3.15E-02	1.00E-05	5.46E-02	1.01E-03	5.46E+01
Ru-103	1.67E-04	5.42E-03	6.18E+06	1.98E+00	3.70E-01	1.67E-05	9.00E-01	6.87E-02	6.87E-06	0.00E+00	0.00E+00	2.20E-07	5.35E+01
Ru-106	1.35E-04	1.97E-02	5.01E+06	1.60E+00	3.70E-02	1.35E-04	2.00E-01	2.50E-01	2.50E-05	0.00E+00	0.00E+00	8.02E-07	4.33E+01
Ce-144	1.16E-04	1.69E-02	4.27E+06	1.37E+00	3.70E-02	1.16E-04	2.00E-01	2.14E-01	2.14E-05	0.00E+00	0.00E+00	6.84E-07	3.70E+01
Pu-239	7.77E-05	1.13E+01	2.88E+06	9.21E-01	3.70E-04	7.77E-03	2.00E-04	1.44E+02	1.44E-02	1.25E-03	2.49E-02	4.60E-04	2.49E+01
Cm-244	5.64E-05	4.12E+00	2.09E+06	6.69E-01	3.70E-04	5.64E-03	4.00E-04	5.22E+01	5.22E-03	0.00E+00	0.00E+00	1.67E-04	1.81E+01
Sb-125	5.46E-05	1.77E-03	2.02E+06	6.47E-01	3.70E-01	5.46E-06	9.00E-01	2.25E-02	2.25E-06	0.00E+00	0.00E+00	7.19E-08	1.75E+01
U-233	4.74E-05	1.38E+00	1.75E+06	5.61E-01	3.70E-03	4.74E-04	1.00E-03	1.75E+01	1.75E-03	4.88E-03	0.00E+00	5.61E-05	1.52E+01
Nb-95	4.46E-05	1.30E-03	1.65E+06	5.29E-01	3.70E-01	4.46E-06	1.00E+00	1.65E-02	1.65E-06	0.00E+00	0.00E+00	5.29E-08	1.43E+01
Zr-95	3.94E-05	1.28E-03	1.46E+06	4.67E-01	3.70E-01	3.94E-06	9.00E-01	1.62E-02	1.62E-06	0.00E+00	0.00E+00	5.19E-08	1.26E+01
Eu-155	3.94E-05	5.75E-04	1.46E+06	4.67E-01	3.70E-01	3.94E-06	2.00E+00	7.28E-03	7.28E-07	0.00E+00	0.00E+00	2.33E-08	1.26E+01
Co-58	2.03E-05	5.92E-04	7.50E+05	2.40E-01	3.70E-01	2.03E-06	1.00E+00	7.50E-03	7.50E-07	0.00E+00	0.00E+00	2.40E-08	6.49E+00
Zn-65	1.82E-05	2.66E-04	6.75E+05	2.16E-01	3.70E-01	1.82E-06	2.00E+00	3.37E-03	3.37E-07	0.00E+00	0.00E+00	1.08E-08	5.84E+00
Ag-110m	1.74E-05	1.27E-03	6.45E+05	2.06E-01	3.70E-01	1.74E-06	4.00E-01	1.61E-02	1.61E-06	0.00E+00	0.00E+00	5.16E-08	5.58E+00
Cs-134	1.39E-05	8.14E-04	5.16E+05	1.65E-01	3.70E-02	1.39E-05	5.00E-01	1.03E-02	1.03E-06	0.00E+00	0.00E+00	3.30E-08	4.46E+00
Ag-108m	9.91E-06	4.82E-04	3.67E+05	1.17E-01	3.70E-01	9.91E-07	6.00E-01	6.11E-03	6.11E-07	0.00E+00	0.00E+00	1.96E-08	3.17E+00
Mn-54	7.26E-06	2.12E-04	2.69E+05	8.60E-02	3.70E-01	7.26E-07	1.00E+00	2.69E-03	2.69E-07	0.00E+00	0.00E+00	8.60E-09	2.32E+00
Ra-226	5.42E-06	7.91E-03	2.01E+05	6.42E-02	3.70E-03	5.42E-05	2.00E-02	1.00E-01	1.00E-05	0.00E+00	0.00E+00	3.21E-07	1.74E+00
U-235	1.44E-06	0.00E+00	5.31E+04	1.70E-02	3.70E-03	1.44E-05	Unlimited	0.00E+00	0.00E+00	6.53E-01	0.00E+00	0.00E+00	4.60E-01
Th-234	7.92E-07	1.16E-04	2.93E+04	9.38E-03	3.70E+00	7.92E-09	2.00E-01	1.47E-03	1.47E-07	0.00E+00	0.00E+00	4.69E-09	2.54E-01
U-238	7.79E-07	0.00E+00	2.88E+04	9.23E-03	3.70E-03	7.79E-06	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.50E-01
Cm-242	6.70E-07	1.95E-03	2.48E+04	7.93E-03	3.70E-02	6.70E-07	1.00E-02	2.48E-02	2.48E-06	0.00E+00	0.00E+00	7.93E-08	2.14E-01
I-129	6.13E-07	0.00E+00	2.27E+04	7.27E-03	3.70E-05	6.13E-04	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.96E-01
Np-237	2.39E-07	3.48E-02	8.83E+03	2.83E-03	3.70E-04	2.39E-05	2.00E-04	4.42E-01	4.42E-05	0.00E+00	7.65E-05	1.41E-06	7.65E-02
Pa-233	2.39E-07	7.74E-06	8.83E+03	2.83E-03	3.70E+00	2.39E-09	9.00E-01	9.81E-05	9.81E-09	0.00E+00	0.00E+00	3.14E-10	7.64E-02
Total	1.69E-01	100.00%	6.27E+09	2.01E+03		8.22E-01		1.27E+03	1.27E-01	6.59E-01	1.41E-01	4.06E-03	5.42E+04

DOT regulated as Hazard Class 7 Radioactive Material
NOT an RQ amount of a Hazardous Substance
< Type A quantity/package per 49 CFR 173.431(a); check if excepted quantity -> excepted packaging
Does NOT meet LTD QTY Exception; Check if LSA
Meets Low Specific Activity (LSA)-II material - Check <Type A quantity and use Radioactive material, LSA, n.o.s. as PSN
Meets criteria for Fissile Excepted Package per 49 CFR 173.453
This is a Low-level waste

Performed by: Gordon Harris Date: 9/25/01

Reviewed by: _____ Date: _____

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Section III: Check radionuclides for listing on labels and shipping papers

Nuclide	Activity (Ci)	% of Total A2 Fraction	Cumulative A2 Fraction
Am-241	1.79E-04	2.79E+01	2.79E+01
Pu-238	1.59E-04	2.49E+01	5.28E+01
Sr-90	6.44E-02	2.01E+01	7.29E+01
Pu-239	7.25E-05	1.13E+01	8.43E+01
Pu-241	1.70E-03	5.32E+00	8.96E+01
Cs-137	7.35E-02	4.60E+00	9.42E+01
Cm-244	5.27E-05	4.12E+00	9.83E+01
U-233	4.42E-05	1.38E+00	9.97E+01
Co-60	2.03E-03	1.59E-01	9.99E+01
Np-237	2.23E-07	3.48E-02	9.99E+01
Eu-154	3.96E-04	2.48E-02	9.99E+01
Ru-106	1.26E-04	1.97E-02	9.99E+01
Ce-144	1.08E-04	1.69E-02	1.00E+02
Ni-63	1.40E-02	1.46E-02	1.00E+02
Eu-152	2.95E-04	1.02E-02	1.00E+02
Ra-226	5.06E-06	7.91E-03	1.00E+02
Ru-103	1.56E-04	5.42E-03	1.00E+02
Cm-242	6.25E-07	1.95E-03	1.00E+02
Sb-125	5.10E-05	1.77E-03	1.00E+02
Nb-95	4.16E-05	1.30E-03	1.00E+02
Zr-95	3.68E-05	1.28E-03	1.00E+02
Ag-110m	1.63E-05	1.27E-03	1.00E+02
Cs-134	1.30E-05	8.14E-04	1.00E+02
Co-58	1.89E-05	5.92E-04	1.00E+02
Eu-155	3.67E-05	5.75E-04	1.00E+02
Ag-108m	9.25E-06	4.82E-04	1.00E+02
H-3	5.57E-04	4.35E-04	1.00E+02
Zn-65	1.70E-05	2.66E-04	1.00E+02
Mn-54	6.77E-06	2.12E-04	1.00E+02
Th-234	7.27E-07	1.14E-04	1.00E+02
Pa-233	2.23E-07	7.74E-06	1.00E+02
U-235	1.34E-06	0.00E+00	1.00E+02
U-238	7.27E-07	0.00E+00	1.00E+02
I-129	5.72E-07	0.00E+00	1.00E+02

Nuclide	Activity (Ci)	% of Total Activity	Activity Conc. (pCi/g)	Source Material (kg)	SNM (g)	Fraction of Rad Mat License	Activity Conc. (Ci/m3)
Cs-137	7.88E-02	4.65E+01	2.52E+04	Not applicable	Not applicable	4.21E-01	4.01E-02
Sr-90	6.90E-02	4.07E+01	2.21E+04	Not applicable	Not applicable	8.83E-01	3.51E-02
Ni-63	1.50E-02	8.88E+00	4.82E+03	Not applicable	Not applicable	2.19E-03	7.66E-03
Co-60	2.18E-03	1.28E+00	6.97E+02	Not applicable	Not applicable	2.32E-02	1.11E-03
Pu-241	1.82E-03	1.08E+00	5.83E+02	Not applicable	1.82E-05	1.67E-03	9.28E-04
H-3	5.97E-04	3.52E-01	1.91E+02	Not applicable	Not applicable	7.64E-06	3.04E-04
Eu-154	4.25E-04	2.51E-01	1.36E+02	Not applicable	Not applicable	4.53E-03	2.16E-04
Eu-152	3.16E-04	1.86E-01	1.01E+02	Not applicable	Not applicable	5.05E-03	1.61E-04
Am-241	1.91E-04	1.13E-01	6.13E+01	Not applicable	Not applicable	6.13E-03	9.75E-05
Pu-238	1.70E-04	1.01E-01	5.46E+01	Not applicable	1.00E-05	5.46E-03	8.68E-05
Ru-103	1.67E-04	9.87E-02	5.35E+01	Not applicable	Not applicable	#DIV/0!	8.51E-05
Ru-106	1.35E-04	7.99E-02	4.33E+01	Not applicable	Not applicable	#DIV/0!	6.89E-05
Ce-144	1.16E-04	6.82E-02	3.70E+01	Not applicable	Not applicable	#DIV/0!	5.88E-05
Pu-239	7.77E-05	4.59E-02	2.49E+01	Not applicable	1.25E-03	2.49E-03	3.96E-05
Cm-244	5.64E-05	3.33E-02	1.81E+01	Not applicable	Not applicable	1.81E-03	2.87E-05
Sb-125	5.46E-05	3.23E-02	1.75E+01	Not applicable	Not applicable	#DIV/0!	2.78E-05
U-233	4.74E-05	2.80E-02	1.52E+01	Not applicable	4.88E-03	2.02E-04	2.41E-05
Nb-95	4.46E-05	2.63E-02	1.43E+01	Not applicable	Not applicable	#DIV/0!	2.27E-05
Zr-95	3.94E-05	2.33E-02	1.26E+01	Not applicable	Not applicable	#DIV/0!	2.01E-05
Eu-155	3.94E-05	2.32E-02	1.26E+01	Not applicable	Not applicable	2.87E-08	2.01E-05
Co-58	2.03E-05	1.20E-02	6.49E+00	Not applicable	Not applicable	#DIV/0!	1.03E-05
Zn-65	1.82E-05	1.08E-02	5.84E+00	Not applicable	Not applicable	#DIV/0!	9.29E-06
Ag-110m	1.74E-05	1.03E-02	5.58E+00	Not applicable	Not applicable	#DIV/0!	8.88E-06
Cs-134	1.39E-05	8.23E-03	4.46E+00	Not applicable	Not applicable	1.01E-08	7.10E-06
Ag-108m	9.91E-06	5.85E-03	3.17E+00	Not applicable	Not applicable	6.35E-05	5.05E-06
Mn-54	7.26E-06	4.29E-03	2.32E+00	Not applicable	Not applicable	#DIV/0!	3.70E-06
Ra-226	5.42E-06	3.20E-03	1.74E+00	Not applicable	Not applicable	#DIV/0!	2.76E-06
U-235	1.44E-06	8.48E-04	4.60E-01	Not applicable	6.53E-01	2.42E-04	7.31E-07
Th-234	7.92E-07	4.68E-04	2.54E-01	Not applicable	Not applicable	#DIV/0!	4.03E-07
U-238	7.79E-07	4.60E-04	2.50E-01	Not applicable	Not applicable	7.56E-07	3.97E-07
Cm-242	6.70E-07	3.95E-04	2.14E-01	Not applicable	Not applicable	1.07E-07	3.41E-07
I-129	6.13E-07	3.62E-04	1.96E-01	Not applicable	Not applicable	6.34E-05	3.12E-07
Np-237	2.39E-07	1.41E-04	7.65E-02	Not applicable	Not applicable	7.65E-06	1.22E-07
Pa-233	2.39E-07	1.41E-04	7.64E-02	Not applicable	Not applicable	#DIV/0!	1.22E-07

"#DIV/0!" occurring in the Fraction of the Rad Mat License indicates a nuclide not specifically listed in the Envirocare Radioactive Material License but is exempt as a short-lived decay product when it's concentration is equal to the parent.

Waste Classification Determination for near surface disposal per 10 CFR §61.55

Assume that Sr-90, Cs-137, and Ni-63 are major nuclides driving waste classification determination for Tank V-1, V-2, and V-3 wastes

Radionuclide	Table 2 limit (Ci/m^3) Column 1	Column 2	V-1 7 gal
Cs-137	1	44	4.01E-02
Sr-90	0.04	150	3.51E-02
Ni-63	3.5	70	7.66E-03
Class A Sum of Fractions:			0.92
Class B Sum of Fractions:			0.00
			Class A

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Container ID # **INEEL V-2 solid and liquid contents whole tank**

Constants	Units
3.70E+10	Bq/Ci
453.6	g/lb
1.00E-12	TBq/Bq or Ci/pCi
1000.00	g/kg
1.00E+09	nCi/Ci

Section I. Waste Stream Information

Container Type: V-2 Tank Form# N/A NTS Waste Stream # N/A

Description: Homogenous mix PKE# N/A SNL Waste Stream# N/A

Container Gross Wt (lb)	Container Gross Wt (kg)	Container Tare Wt (lb)	Container Tare Wt (kg)	Waste Net Wt (kg)	External Vol. (m3)	Est. Waste Vol. (m3)
13167.00	5972.55	0.00	0.00	5972.55	40.030	6.042

Gross Wt (lb) estimated for contents only at 1596 gal @ 8.25 lb/gal -> 13,167 lbs.

Dose rates from *MicroShield v5.01*: 794 mR/hr on contact and 43.6 mR/hr at 1 meter.

Dose survey from Sxxxxx on xx/xx/00 shows [792] mrem/hr OC.

Radioactive liquid effluents from hot cells, labs, and decon facilities at TAN and IETF.

EPA regulated hazardous COCs: Barium, Cadmium, Chromium, Lead, Mercury, Silver, VOCs, SVOCs, and PCBs.

Section II. List the radionuclides and activities; perform DOT RAM, RQ, LTD QTY, and Type A Packaging checks

Nuclide	Activity (Ci)	% of Total A2 Fraction	Activity (Bq)	Activity/gram (Bq/gram)	RQ limits (TBq)	RQ Ratios (amount/limit)	A2 Value (TBq)	LTD QTY Det. (amount/(10-4)A2)	Type A Pkg? (amount/A2)	DOT Fissile Mass (g)	TRU Conc. (nCi/g)	LSA-II Liquids Fraction	Activity/gram (pCi/g)
Sr-90	2.75E+01	5.59E+01	1.02E+12	1.71E+05	3.70E-03	2.75E+02	1.00E-01	1.02E+05	1.02E+01	0.00E+00	0.00E+00	1.71E-01	4.61E+06
Cs-137	1.56E+01	6.34E+00	5.77E+11	9.66E+04	3.70E-02	1.56E+01	5.00E-01	1.15E+04	1.15E+00	0.00E+00	0.00E+00	1.93E-02	2.61E+06
Ni-63	1.85E+00	1.25E-02	6.84E+10	1.15E+04	3.70E+00	1.85E-02	3.00E+01	2.28E+01	2.28E-03	0.00E+00	0.00E+00	3.82E-05	3.10E+05
Co-60	5.40E-01	2.74E-01	2.00E+10	3.34E+03	3.70E-01	5.40E-02	4.00E-01	4.99E+02	4.99E-02	0.00E+00	0.00E+00	8.36E-04	9.03E+04
H-3	4.15E-01	2.11E-03	1.54E+10	2.57E+03	3.70E+00	4.15E-03	4.00E+01	3.84E+00	3.84E-04	0.00E+00	0.00E+00	6.43E-06	6.96E+04
Pu-241	4.75E-02	9.64E-01	1.76E+09	2.94E+02	3.70E-02	4.75E-02	1.00E-02	1.76E+03	1.76E-01	4.75E-04	0.00E+00	2.94E-03	7.95E+03
Eu-154	4.65E-02	1.89E-02	1.72E+09	2.88E+02	3.70E-01	4.65E-03	5.00E-01	3.44E+01	3.44E-03	0.00E+00	0.00E+00	5.76E-05	7.78E+03
Eu-152	3.24E-02	7.31E-03	1.20E+09	2.01E+02	3.70E-01	3.24E-03	9.00E-01	1.33E+01	1.33E-03	0.00E+00	0.00E+00	2.23E-05	5.42E+03
Ru-103	2.43E-02	5.48E-03	8.99E+08	1.50E+02	3.70E-01	2.43E-03	9.00E-01	9.99E+00	9.99E-04	0.00E+00	0.00E+00	1.67E-05	4.07E+03
Ru-106	2.28E-02	2.32E-02	8.44E+08	1.41E+02	3.70E-02	2.28E-02	2.00E-01	4.22E+01	4.22E-03	0.00E+00	0.00E+00	7.06E-05	3.82E+03
Ce-144	1.92E-02	1.95E-02	7.12E+08	1.19E+02	3.70E-02	1.92E-02	2.00E-01	3.56E+01	3.56E-03	0.00E+00	0.00E+00	5.96E-05	3.22E+03
Pu-238	1.58E-02	1.61E+01	5.86E+08	9.82E+01	3.70E-04	1.58E+00	2.00E-04	2.93E+04	2.93E+00	9.32E-04	2.65E+00	4.91E-02	2.65E+03
Pu-239	1.34E-02	1.36E+01	4.95E+08	8.28E+01	3.70E-04	1.34E+00	2.00E-04	2.47E+04	2.47E+00	2.16E-01	2.24E+00	4.14E-02	2.24E+03
Sb-125	8.94E-03	2.02E-03	3.31E+08	5.54E+01	3.70E-01	8.94E-04	9.00E-01	3.68E+00	3.68E-04	0.00E+00	0.00E+00	6.16E-06	1.50E+03
Eu-155	8.08E-03	8.21E-04	2.99E+08	5.01E+01	3.70E-01	8.08E-04	2.00E+00	1.50E+00	1.50E-04	0.00E+00	0.00E+00	2.50E-06	1.35E+03
U-233	6.66E-03	1.35E+00	2.46E+08	4.12E+01	3.70E-03	6.66E-02	1.00E-03	2.46E+03	2.46E-01	6.86E-01	0.00E+00	4.12E-03	1.11E+03
Zr-95	5.88E-03	1.33E-03	2.18E+08	3.64E+01	3.70E-01	5.88E-04	9.00E-01	2.42E+00	2.42E-04	0.00E+00	0.00E+00	4.05E-06	9.85E+02
Am-241	4.98E-03	5.06E+00	1.84E+08	3.09E+01	3.70E-04	4.98E-01	2.00E-04	9.22E+03	9.22E-01	0.00E+00	8.35E-01	1.54E-02	8.35E+02
Ra-226	4.94E-03	5.01E-02	1.83E+08	3.06E+01	3.70E-03	4.94E-02	2.00E-02	9.13E+01	9.13E-03	0.00E+00	0.00E+00	1.53E-04	8.26E+02
Ag-110m	3.45E-03	1.75E-03	1.28E+08	2.14E+01	3.70E-01	3.45E-04	4.00E-01	3.20E+00	3.20E-04	0.00E+00	0.00E+00	5.35E-06	5.78E+02
Nb-95	3.29E-03	6.69E-04	1.22E+08	2.04E+01	3.70E-01	3.29E-04	1.00E+00	1.22E+00	1.22E-04	0.00E+00	0.00E+00	2.04E-06	5.51E+02
Co-58	3.13E-03	6.35E-04	1.16E+08	1.94E+01	3.70E-01	3.13E-04	1.00E+00	1.16E+00	1.16E-04	0.00E+00	0.00E+00	1.94E-06	5.23E+02
Zn-65	2.99E-03	3.03E-04	1.10E+08	1.85E+01	3.70E-01	2.99E-04	2.00E+00	5.52E-01	5.52E-05	0.00E+00	0.00E+00	9.25E-07	5.00E+02
Ag-108m	2.05E-03	6.92E-04	7.57E+07	1.27E+01	3.70E-01	2.05E-04	6.00E-01	1.26E+00	1.26E-04	0.00E+00	0.00E+00	2.11E-06	3.42E+02
Mn-54	1.17E-03	2.38E-04	4.33E+07	7.25E+00	3.70E-01	1.17E-04	1.00E+00	4.33E-01	4.33E-05	0.00E+00	0.00E+00	7.25E-07	1.96E+02
Cs-134	1.10E-03	4.48E-04	4.08E+07	6.84E+00	3.70E-02	1.10E-03	5.00E-01	8.17E-01	8.17E-05	0.00E+00	0.00E+00	1.37E-06	1.85E+02
Cm-243	3.25E-04	2.20E-01	1.20E+07	2.02E+00	3.70E-04	3.25E-02	3.00E-04	4.01E+02	4.01E-02	0.00E+00	5.45E-02	6.72E-04	5.45E+01
U-235	2.05E-04	0.00E+00	7.60E+06	1.27E+00	3.70E-03	2.05E-03	Unlimited	0.00E+00	0.00E+00	9.33E+01	0.00E+00	0.00E+00	3.44E+01
U-238	1.80E-04	0.00E+00	6.65E+06	1.11E+00	3.70E-03	1.80E-03	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.01E+01
Th-234	1.80E-04	1.83E-04	6.65E+06	1.11E+00	3.70E+00	1.80E-06	2.00E-01	3.33E-01	3.33E-05	0.00E+00	0.00E+00	5.57E-07	3.01E+01
I-129	1.39E-04	0.00E+00	5.15E+06	8.62E-01	3.70E-05	1.39E-01	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.33E+01
Pa-233	5.72E-05	1.29E-05	2.12E+06	3.55E-01	3.70E+00	5.72E-07	9.00E-01	2.35E-02	2.35E-06	0.00E+00	0.00E+00	3.94E-08	9.59E+00
Np-237	5.25E-05	5.33E-02	1.94E+06	3.25E-01	3.70E-04	5.25E-03	2.00E-04	9.71E+01	9.71E-03	0.00E+00	8.79E-03	1.63E-04	8.79E+00
Cm-242	9.21E-06	1.87E-04	3.41E+05	5.71E-02	3.70E-02	9.21E-06	1.00E-02	3.41E-01	3.41E-05	0.00E+00	0.00E+00	5.71E-07	1.54E+00
Total	4.62E+01	100.00%	1.71E+12	2.86E+05		2.95E+02		1.82E+05	1.82E+01	9.42E+01	5.79E+00	3.05E-01	7.74E+06

DOT regulated as Hazard Class 7 Radioactive Material
Contains a Reportable Quantity of a Hazardous Substance; use 'RQ(radionuclides)' as part of PSN
> Type A quantity; requires Type B Packaging
Does NOT meet LTD QTY Exception; Check if LSA
Meets Low Specific Activity (LSA)-II material - Check <Type A quantity and use Radioactive material, LSA, n.o.s. as PSN
>15 grams Fissile Material - use Radioactive material, fissile material, n.o.s. as PSN
This is a Low-level waste

Performed by: Gordon Harris Date: 9/25/01

Reviewed by: _____ Date: _____

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Section III: Check radionuclides for listing on labels and shipping papers

Nuclide	Activity (Ci)	% of Total A2 Fraction	Cumulative A2 Fraction
Sr-90	2.75E+01	5.59E+01	5.59E+01
Pu-238	1.58E-02	1.61E+01	7.20E+01
Pu-239	1.34E-02	1.36E+01	8.56E+01
Cs-137	1.56E+01	6.34E+00	9.19E+01
Am-241	4.98E-03	5.06E+00	9.70E+01
U-233	6.66E-03	1.35E+00	9.83E+01
Pu-241	4.75E-02	9.64E-01	9.93E+01
Co-60	5.40E-01	2.74E-01	9.96E+01
Cm-243	3.25E-04	2.20E-01	9.98E+01
Np-237	5.25E-05	5.33E-02	9.99E+01
Ra-226	4.94E-03	5.01E-02	9.99E+01
Ru-106	2.28E-02	2.32E-02	9.99E+01
Ce-144	1.92E-02	1.95E-02	9.99E+01
Eu-154	4.65E-02	1.89E-02	1.00E+02
Ni-63	1.85E+00	1.25E-02	1.00E+02
Eu-152	3.24E-02	7.31E-03	1.00E+02
Ru-103	2.43E-02	5.48E-03	1.00E+02
H-3	4.15E-01	2.11E-03	1.00E+02
Sb-125	8.94E-03	2.02E-03	1.00E+02
Ag-110m	3.45E-03	1.75E-03	1.00E+02
Zr-95	5.88E-03	1.33E-03	1.00E+02
Eu-155	8.08E-03	8.21E-04	1.00E+02
Ag-108m	2.05E-03	6.92E-04	1.00E+02
Nb-95	3.29E-03	6.69E-04	1.00E+02
Co-58	3.13E-03	6.35E-04	1.00E+02
Cs-134	1.10E-03	4.48E-04	1.00E+02
Zn-65	2.99E-03	3.03E-04	1.00E+02
Mn-54	1.17E-03	2.38E-04	1.00E+02
Cm-242	9.21E-06	1.87E-04	1.00E+02
Th-234	1.80E-04	1.83E-04	1.00E+02
Pa-233	5.72E-05	1.29E-05	1.00E+02
U-235	2.05E-04	0.00E+00	1.00E+02
U-238	1.80E-04	0.00E+00	1.00E+02
I-129	1.39E-04	0.00E+00	1.00E+02

Nuclide	Activity (Ci)	% of Total Activity	Activity Conc. (pCi/g)	Source Material (kg)	SNM (g)	Fraction of Rad Mat License	Activity Conc. (Ci/m3)
Sr-90	2.75E+01	5.96E+01	4.61E+06	Not applicable	Not applicable	1.84E+02	4.56E+00
Cs-137	1.56E+01	3.38E+01	2.61E+06	Not applicable	Not applicable	4.35E+01	2.58E+00
Ni-63	1.85E+00	4.00E+00	3.10E+05	Not applicable	Not applicable	1.41E-01	3.06E-01
Co-60	5.40E-01	1.17E+00	9.03E+04	Not applicable	Not applicable	3.01E+00	8.93E-02
H-3	4.15E-01	8.99E-01	6.96E+04	Not applicable	Not applicable	2.78E-03	6.88E-02
Pu-241	4.75E-02	1.03E-01	7.95E+03	Not applicable	4.75E-04	2.27E-02	7.85E-03
Eu-154	4.65E-02	1.01E-01	7.78E+03	Not applicable	Not applicable	2.59E-01	7.69E-03
Eu-152	3.24E-02	7.01E-02	5.42E+03	Not applicable	Not applicable	2.71E-01	5.36E-03
Ru-103	2.43E-02	5.26E-02	4.07E+03	Not applicable	Not applicable	#DIV/0!	4.02E-03
Ru-106	2.28E-02	4.94E-02	3.82E+03	Not applicable	Not applicable	#DIV/0!	3.77E-03
Ce-144	1.92E-02	4.16E-02	3.22E+03	Not applicable	Not applicable	#DIV/0!	3.18E-03
Pu-238	1.58E-02	3.43E-02	2.65E+03	Not applicable	9.32E-04	2.65E-01	2.62E-03
Pu-239	1.34E-02	2.89E-02	2.24E+03	Not applicable	2.16E-01	2.24E-01	2.21E-03
Sb-125	8.94E-03	1.94E-02	1.50E+03	Not applicable	Not applicable	#DIV/0!	1.48E-03
Eu-155	8.08E-03	1.75E-02	1.35E+03	Not applicable	Not applicable	3.08E-06	1.34E-03
U-233	6.66E-03	1.44E-02	1.11E+03	Not applicable	6.86E-01	1.49E-02	1.10E-03
Zr-95	5.88E-03	1.27E-02	9.85E+02	Not applicable	Not applicable	#DIV/0!	9.73E-04
Am-241	4.98E-03	1.08E-02	8.35E+02	Not applicable	Not applicable	8.35E-02	8.25E-04
Ra-226	4.94E-03	1.07E-02	8.26E+02	Not applicable	Not applicable	#DIV/0!	8.17E-04
Ag-110m	3.45E-03	7.48E-03	5.78E+02	Not applicable	Not applicable	#DIV/0!	5.72E-04
Nb-95	3.29E-03	7.13E-03	5.51E+02	Not applicable	Not applicable	#DIV/0!	5.45E-04
Co-58	3.13E-03	6.77E-03	5.23E+02	Not applicable	Not applicable	#DIV/0!	5.18E-04
Zn-65	2.99E-03	6.46E-03	5.00E+02	Not applicable	Not applicable	#DIV/0!	4.94E-04
Ag-108m	2.05E-03	4.43E-03	3.42E+02	Not applicable	Not applicable	6.85E-03	3.39E-04
Mn-54	1.17E-03	2.53E-03	1.96E+02	Not applicable	Not applicable	#DIV/0!	1.94E-04
Cs-134	1.10E-03	2.39E-03	1.85E+02	Not applicable	Not applicable	4.20E-07	1.83E-04
Cm-243	3.25E-04	7.04E-04	5.45E+01	Not applicable	Not applicable	5.45E-03	5.38E-05
U-235	2.05E-04	4.44E-04	3.44E+01	Not applicable	9.33E+01	1.81E-02	3.40E-05
U-238	1.80E-04	3.89E-04	3.01E+01	Not applicable	Not applicable	9.12E-05	2.98E-05
Th-234	1.80E-04	3.89E-04	3.01E+01	Not applicable	Not applicable	#DIV/0!	2.98E-05
I-129	1.39E-04	3.01E-04	2.33E+01	Not applicable	Not applicable	7.51E-03	2.30E-05
Pa-233	5.72E-05	1.24E-04	9.59E+00	Not applicable	Not applicable	#DIV/0!	9.48E-06
Np-237	5.25E-05	1.14E-04	8.79E+00	Not applicable	Not applicable	8.79E-04	8.69E-06
Cm-242	9.21E-06	1.99E-05	1.54E+00	Not applicable	Not applicable	7.71E-07	1.52E-06

"#DIV/0!" occurring in the Fraction of the Rad Mat License indicates a nuclide not specifically listed in the Envirocare Radioactive Material License but is exempt as a short-lived decay product when it's concentration is equal to the parent.

Waste Classification Determination for near surface disposal per 10 CFR §61.55

Assume that Sr-90, Cs-137, and Ni-63 are major nuclides driving waste classification determination for Tank V-1, V-2, and V-3 wastes

Radionuclide	Table 2 limit (Ci/m^3) Column 1	Column 2	V-2 Tank
Cs-137	1	44	2.58E+00
Sr-90	0.04	150	4.56E+00
Ni-63	3.5	70	3.06E-01
Class A Sum of Fractions:			116.57
Class B Sum of Fractions:			0.09
			Class B

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Container ID # **INEEL V-2 solid and liquid contents (4 gal) + clean soil (514.0 gal [2.545 yd^3])**

Note: HIC Liner capacity is 804.9 gallons; assume 64.3% full to meet liner max load limit of 7500 lbs.

Constants	Units
3.70E+10	Bq/Ci
453.6	g/lb
1.00E-12	TBq/Bq or Ci/pCi
1000.00	g/kg
1.00E+09	nCi/Ci

Section I. Waste Stream Information

Container Type: HIC Liner PL8-120 MT Form# N/A NTS Waste Stream # N/A

Description: Homogenous mix + soil PKE# N/A SNL Waste Stream# N/A

Container Gross Wt (lb)	Container Gross Wt (kg)	Container Tare Wt (lb)	Container Tare Wt (kg)	Waste Net Wt (kg)	External Vol. (m3)	Est. Waste Vol. (m3)
7495.40	3399.91	600.00	272.16	3127.75	3.427	1.961

Dose rates from *MicroShield v5.01*: 794 mR/hr on contact and 43.6 mR/hr at 1 meter.

Dose survey from Sxxxxx on xx/xx/00 shows [792] mrem/hr OC.

Radioactive liquid effluents from hot cells, labs, and decon facilities at TAN and IETF.

EPA regulated hazardous COCs: Barium, Cadmium, Chromium, Lead, Mercury, Silver, VOCs, SVOCs, and PCBs.

Gross Wt (lb) estimated at 4 gal @ 8.25 lb/gal plus 514.0 gal of soil @ 13.351 lb./gal plus tare weight = 7,495.4 lbs.

Section II. List the radionuclides and activities; perform DOT RAM, RQ, LTD QTY, and Type A Packaging checks

Nuclide	Activity (Ci)	% of Total A2 Fraction	Activity (Bq)	Activity/gram (Bq/gram)	RQ limits (TBq)	RQ Ratios (amount/limit)	A2 Value (TBq)	LTD QTY Det. (amount/(10-4)A2)	Type A Pkg? (amount/A2)	DOT Fissile Mass (g)	TRU Conc. (nCi/g)	LSA-II Liquids Fraction	Activity/gram (pCi/g)
Sr-90	6.90E-02	5.59E+01	2.55E+09	8.16E+02	3.70E-03	6.90E-01	1.00E-01	2.55E+02	2.55E-02	0.00E+00	0.00E+00	8.16E-04	2.21E+04
Cs-137	3.91E-02	6.34E+00	1.45E+09	4.62E+02	3.70E-02	3.91E-02	5.00E-01	2.89E+01	2.89E-03	0.00E+00	0.00E+00	9.25E-05	1.25E+04
Ni-63	4.63E-03	1.25E-02	1.71E+08	5.48E+01	3.70E+00	4.63E-05	3.00E+01	5.72E-02	5.72E-06	0.00E+00	0.00E+00	1.83E-07	1.48E+03
Co-60	1.35E-03	2.74E-01	5.00E+07	1.60E+01	3.70E-01	1.35E-04	4.00E-01	1.25E+00	1.25E-04	0.00E+00	0.00E+00	4.00E-06	4.32E+02
H-3	1.04E-03	2.11E-03	3.85E+07	1.23E+01	3.70E+00	1.04E-05	4.00E+01	9.63E-03	9.63E-07	0.00E+00	0.00E+00	3.08E-08	3.33E+02
Pu-241	1.19E-04	9.64E-01	4.40E+06	1.41E+00	3.70E-02	1.19E-04	1.00E-02	4.40E+00	4.40E-04	1.19E-06	0.00E+00	1.41E-05	3.80E+01
Eu-154	1.17E-04	1.89E-02	4.31E+06	1.38E+00	3.70E-01	1.17E-05	5.00E-01	8.62E-02	8.62E-06	0.00E+00	0.00E+00	2.76E-07	3.73E+01
Eu-152	8.12E-05	7.31E-03	3.00E+06	9.61E-01	3.70E-01	8.12E-06	9.00E-01	3.34E-02	3.34E-06	0.00E+00	0.00E+00	1.07E-07	2.60E+01
Ru-103	6.09E-05	5.48E-03	2.25E+06	7.20E-01	3.70E-01	6.09E-06	9.00E-01	2.50E-02	2.50E-06	0.00E+00	0.00E+00	8.00E-08	1.95E+01
Ru-106	5.72E-05	2.32E-02	2.11E+06	6.76E-01	3.70E-02	5.72E-05	2.00E-01	1.06E-01	1.06E-05	0.00E+00	0.00E+00	3.38E-07	1.83E+01
Ce-144	4.82E-05	1.95E-02	1.78E+06	5.70E-01	3.70E-02	4.82E-05	2.00E-01	8.92E-02	8.92E-06	0.00E+00	0.00E+00	2.85E-07	1.54E+01
Pu-238	3.97E-05	1.61E+01	1.47E+06	4.70E-01	3.70E-04	3.97E-03	2.00E-04	7.35E+01	7.35E-03	2.34E-06	1.27E-02	2.35E-04	1.27E+01
Pu-239	3.35E-05	1.36E+01	1.24E+06	3.96E-01	3.70E-04	3.35E-03	2.00E-04	6.20E+01	6.20E-03	5.41E-04	1.07E-02	1.98E-04	1.07E+01
Sb-125	2.24E-05	2.02E-03	8.29E+05	2.65E-01	3.70E-01	2.24E-06	9.00E-01	9.22E-03	9.22E-07	0.00E+00	0.00E+00	2.95E-08	7.17E+00
Eu-155	2.03E-05	8.21E-04	7.50E+05	2.40E-01	3.70E-01	2.03E-06	2.00E+00	3.75E-03	3.75E-07	0.00E+00	0.00E+00	1.20E-08	6.48E+00
U-233	1.67E-05	1.35E+00	6.17E+05	1.97E-01	3.70E-03	1.67E-04	1.00E-03	6.17E+00	6.17E-04	1.72E-03	0.00E+00	1.97E-05	5.33E+00
Zr-95	1.47E-05	1.33E-03	5.45E+05	1.74E-01	3.70E-01	1.47E-06	9.00E-01	6.06E-03	6.06E-07	0.00E+00	0.00E+00	1.94E-08	4.71E+00
Am-241	1.25E-05	5.06E+00	4.62E+05	1.48E-01	3.70E-04	1.25E-03	2.00E-04	2.31E+01	2.31E-03	0.00E+00	3.99E-03	7.39E-05	3.99E+00
Ra-226	1.24E-05	5.01E-02	4.58E+05	1.46E-01	3.70E-03	1.24E-04	2.00E-02	2.29E-01	2.29E-05	0.00E+00	0.00E+00	7.32E-07	3.96E+00
Ag-110m	8.66E-06	1.75E-03	3.20E+05	1.02E-01	3.70E-01	8.66E-07	4.00E-01	8.01E-03	8.01E-07	0.00E+00	0.00E+00	2.56E-08	2.77E+00
Nb-95	8.25E-06	6.69E-04	3.05E+05	9.76E-02	3.70E-01	8.25E-07	1.00E+00	3.05E-03	3.05E-07	0.00E+00	0.00E+00	9.76E-09	2.64E+00
Co-58	7.84E-06	6.35E-04	2.90E+05	9.27E-02	3.70E-01	7.84E-07	1.00E+00	2.90E-03	2.90E-07	0.00E+00	0.00E+00	9.27E-09	2.51E+00
Zn-65	7.48E-06	3.03E-04	2.77E+05	8.85E-02	3.70E-01	7.48E-07	2.00E+00	1.38E-03	1.38E-07	0.00E+00	0.00E+00	4.43E-09	2.39E+00
Ag-108m	5.13E-06	6.92E-04	1.90E+05	6.06E-02	3.70E-01	5.13E-07	6.00E-01	3.16E-03	3.16E-07	0.00E+00	0.00E+00	1.01E-08	1.64E+00
Mn-54	2.93E-06	2.38E-04	1.09E+05	3.47E-02	3.70E-01	2.93E-07	1.00E+00	1.09E-03	1.09E-07	0.00E+00	0.00E+00	3.47E-09	9.38E-01
Cs-134	2.77E-06	4.48E-04	1.02E+05	3.27E-02	3.70E-02	2.77E-06	5.00E-01	2.05E-03	2.05E-07	0.00E+00	0.00E+00	6.55E-09	8.85E-01
Cm-243	8.15E-07	2.20E-01	3.02E+04	9.65E-03	3.70E-04	8.15E-05	3.00E-04	1.01E+00	1.01E-04	0.00E+00	2.61E-04	3.22E-06	2.61E-01
U-235	5.15E-07	0.00E+00	1.90E+04	6.09E-03	3.70E-03	5.15E-06	Unlimited	0.00E+00	0.00E+00	2.34E-01	0.00E+00	0.00E+00	1.64E-01
U-238	4.51E-07	0.00E+00	1.67E+04	5.33E-03	3.70E-03	4.51E-06	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.44E-01
Th-234	4.51E-07	1.83E-04	1.67E+04	5.33E-03	3.70E+00	4.51E-09	2.00E-01	8.34E-04	8.34E-08	0.00E+00	0.00E+00	2.66E-09	1.44E-01
I-129	3.49E-07	0.00E+00	1.29E+04	4.12E-03	3.70E-05	3.49E-04	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.11E-01
Pa-233	1.43E-07	1.29E-05	5.31E+03	1.70E-03	3.70E+00	1.43E-09	9.00E-01	5.90E-05	5.90E-09	0.00E+00	0.00E+00	1.89E-10	4.59E-02
Np-237	1.32E-07	5.33E-02	4.87E+03	1.56E-03	3.70E-04	1.32E-05	2.00E-04	2.43E-01	2.43E-05	0.00E+00	4.21E-05	7.78E-07	4.21E-02
Cm-242	2.31E-08	1.87E-04	8.54E+02	2.73E-04	3.70E-02	2.31E-08	1.00E-02	8.54E-04	8.54E-08	0.00E+00	0.00E+00	2.73E-09	7.38E-03
Total	1.16E-01	100.00%	4.28E+09	1.37E+03		7.39E-01		4.57E+02	4.57E-02	2.36E-01	2.77E-02	1.46E-03	3.70E+04

DOT regulated as Hazard Class 7 Radioactive Material
NOT an RQ amount of a Hazardous Substance
< Type A quantity/package per 49 CFR 173.431(a); check if excepted quantity -> excepted packaging
Does NOT meet LTD QTY Exception; Check if LSA
Meets Low Specific Activity (LSA)-II material - Check <Type A quantity and use Radioactive material, LSA, n.o.s. as PSN
Meets criteria for Fissile Excepted Package per 49 CFR 173.453
This is a Low-level waste

Performed by: [signature] Date: 9/25/01

Reviewed by: _____ Date: _____

379105

Section III: Check radionuclides for listing on labels and shipping papers

Nuclide	Activity (Ci)	% of Total A2 Fraction	Cumulative A2 Fraction
Sr-90	6.90E-02	5.59E+01	5.59E+01
Pu-238	3.97E-05	1.61E+01	7.20E+01
Pu-239	3.35E-05	1.36E+01	8.56E+01
Cs-137	3.91E-02	6.34E+00	9.19E+01
Am-241	1.25E-05	5.06E+00	9.70E+01
U-233	1.67E-05	1.35E+00	9.83E+01
Pu-241	1.19E-04	9.64E-01	9.93E+01
Co-60	1.35E-03	2.74E-01	9.96E+01
Cm-243	8.15E-07	2.20E-01	9.98E+01
Np-237	1.32E-07	5.33E-02	9.99E+01
Ra-226	1.24E-05	5.01E-02	9.99E+01
Ru-106	5.72E-05	2.32E-02	9.99E+01
Ce-144	4.82E-05	1.95E-02	9.99E+01
Eu-154	1.17E-04	1.89E-02	1.00E+02
Ni-63	4.63E-03	1.25E-02	1.00E+02
Eu-152	8.12E-05	7.31E-03	1.00E+02
Ru-103	6.09E-05	5.48E-03	1.00E+02
H-3	1.04E-03	2.11E-03	1.00E+02
Sb-125	2.24E-05	2.02E-03	1.00E+02
Ag-110m	8.66E-06	1.75E-03	1.00E+02
Zr-95	1.47E-05	1.33E-03	1.00E+02
Eu-155	2.03E-05	8.21E-04	1.00E+02
Ag-108m	5.13E-06	6.92E-04	1.00E+02
Nb-95	8.25E-06	6.69E-04	1.00E+02
Co-58	7.84E-06	6.35E-04	1.00E+02
Cs-134	2.77E-06	4.48E-04	1.00E+02
Zn-65	7.48E-06	3.03E-04	1.00E+02
Mn-54	2.93E-06	2.38E-04	1.00E+02
Cm-242	2.31E-08	1.87E-04	1.00E+02
Th-234	4.51E-07	1.83E-04	1.00E+02
Pa-233	1.43E-07	1.29E-05	1.00E+02
U-235	5.15E-07	0.00E+00	1.00E+02
U-238	4.51E-07	0.00E+00	1.00E+02
I-129	3.49E-07	0.00E+00	1.00E+02

Nuclide	Activity (Ci)	% of Total Activity	Activity Conc. (pCi/g)	Source Material (kg)	SNM (g)	[redacted]	Activity Conc. (Ci/m3)
Sr-90	6.90E-02	5.96E+01	2.21E+04	Not applicable	Not applicable	8.82E-01	3.52E-02
Cs-137	3.91E-02	3.38E+01	1.25E+04	Not applicable	Not applicable	2.08E-01	1.99E-02
Ni-63	4.63E-03	4.00E+00	1.48E+03	Not applicable	Not applicable	6.73E-04	2.36E-03
Co-60	1.35E-03	1.17E+00	4.32E+02	Not applicable	Not applicable	1.44E-02	6.90E-04
H-3	1.04E-03	8.99E-01	3.33E+02	Not applicable	Not applicable	1.33E-05	5.31E-04
Pu-241	1.19E-04	1.03E-01	3.80E+01	Not applicable	1.19E-06	1.09E-04	6.07E-05
Eu-154	1.17E-04	1.01E-01	3.73E+01	Not applicable	Not applicable	1.24E-03	5.94E-05
Eu-152	8.12E-05	7.01E-02	2.60E+01	Not applicable	Not applicable	1.30E-03	4.14E-05
Ru-103	6.09E-05	5.26E-02	1.95E+01	Not applicable	Not applicable	#DIV/0!	3.10E-05
Ru-106	5.72E-05	4.94E-02	1.83E+01	Not applicable	Not applicable	#DIV/0!	2.91E-05
Ce-144	4.82E-05	4.16E-02	1.54E+01	Not applicable	Not applicable	#DIV/0!	2.46E-05
Pu-238	3.97E-05	3.43E-02	1.27E+01	Not applicable	2.34E-06	1.27E-03	2.03E-05
Pu-239	3.35E-05	2.89E-02	1.07E+01	Not applicable	5.41E-04	1.07E-03	1.71E-05
Sb-125	2.24E-05	1.94E-02	7.17E+00	Not applicable	Not applicable	#DIV/0!	1.14E-05
Eu-155	2.03E-05	1.75E-02	6.48E+00	Not applicable	Not applicable	1.47E-08	1.03E-05
U-233	1.67E-05	1.44E-02	5.33E+00	Not applicable	1.72E-03	7.11E-05	8.51E-06
Zr-95	1.47E-05	1.27E-02	4.71E+00	Not applicable	Not applicable	#DIV/0!	7.52E-06
Am-241	1.25E-05	1.08E-02	3.99E+00	Not applicable	Not applicable	3.99E-04	6.37E-06
Ra-226	1.24E-05	1.07E-02	3.96E+00	Not applicable	Not applicable	#DIV/0!	6.31E-06
Ag-110m	8.66E-06	7.48E-03	2.77E+00	Not applicable	Not applicable	#DIV/0!	4.41E-06
Nb-95	8.25E-06	7.13E-03	2.64E+00	Not applicable	Not applicable	#DIV/0!	4.21E-06
Co-58	7.84E-06	6.77E-03	2.51E+00	Not applicable	Not applicable	#DIV/0!	4.00E-06
Zn-65	7.48E-06	6.46E-03	2.39E+00	Not applicable	Not applicable	#DIV/0!	3.82E-06
Ag-108m	5.13E-06	4.43E-03	1.64E+00	Not applicable	Not applicable	3.28E-05	2.61E-06
Mn-54	2.93E-06	2.53E-03	9.38E-01	Not applicable	Not applicable	#DIV/0!	1.50E-06
Cs-134	2.77E-06	2.39E-03	8.85E-01	Not applicable	Not applicable	2.01E-09	1.41E-06
Cm-243	8.15E-07	7.04E-04	2.61E-01	Not applicable	Not applicable	2.61E-05	4.16E-07
U-235	5.15E-07	4.44E-04	1.64E-01	Not applicable	2.34E-01	8.66E-05	2.62E-07
U-238	4.51E-07	3.89E-04	1.44E-01	Not applicable	Not applicable	4.37E-07	2.30E-07
Th-234	4.51E-07	3.89E-04	1.44E-01	Not applicable	Not applicable	#DIV/0!	2.30E-07
I-129	3.49E-07	3.01E-04	1.11E-01	Not applicable	Not applicable	3.59E-05	1.78E-07
Pa-233	1.43E-07	1.24E-04	4.59E-02	Not applicable	Not applicable	#DIV/0!	7.32E-08
Np-237	1.32E-07	1.14E-04	4.21E-02	Not applicable	Not applicable	4.21E-06	6.71E-08
Cm-242	2.31E-08	1.99E-05	7.38E-03	Not applicable	Not applicable	3.69E-09	1.18E-08

"#DIV/0!" occurring in the Fraction of the Rad Mat License indicates a nuclide not specifically listed in the Envirocare Radioactive Material License but is exempt as a short-lived decay product when it's concentration is equal to the parent.

Waste Classification Determination for near surface disposal per 10 CFR §61.55

Assume that Sr-90, Cs-137, and Ni-63 are major nuclides driving waste classification determination for Tank V-1, V-2, and V-3 wastes

Radionuclide	Table 2 limit (Ci/m^3) Column 1	Column 2	V-2 5 gal/HIC
Cs-137	1	44	1.99E-02
Sr-90	0.04	150	3.52E-02
Ni-63	3.5	70	2.36E-03

Class A Sum of Fractions: 0.90
Class B Sum of Fractions: 0.00
Class A

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Container ID # **INEEL V-3 solid and liquid contents whole tank**

Constants	Units
3.70E+10	Bq/Ci
453.6	g/lb
1.00E-12	TBq/Bq or Ci/pCi
1000.00	g/kg
1.00E+09	nCi/Ci

Section I. Waste Stream Information

Container Type: V-3 Tank Form# N/A NTS Waste Stream # N/A

Description: Homogenous mix PKE# N/A SNL Waste Stream# N/A

Container Gross Wt (lb)	Container Gross Wt (kg)	Container Tare Wt (lb)	Container Tare Wt (kg)	Waste Net Wt (kg)	External Vol. (m3)	Est. Waste Vol. (m3)
53378.00	24212.26	0.00	0.00	24212.26	40.030	24.492

Gross Wt (lb) estimated for contents only at 6470 gal @ 8.25 lb/gal -> 53,378 lbs.

Dose rates from *MicroShield v5.01*: 207 mR/hr on contact and 11.4 mR/hr at 1 meter.

Dose survey from Sxxxxx on xx/xx/00 shows 207 mrem/hr OC.

Radioactive liquid effluents from hot cells, labs, and decon facilities at TAN and IETF.

EPA regulated hazardous COCs: Barium, Cadmium, Chromium, Lead, Mercury, Silver, VOCs, SVOCs, and PCBs.

Section II. List the radionuclides and activities; perform DOT RAM, RQ, LTD QTY, and Type A Packaging checks

Nuclide	Activity (Ci)	% of Total A2 Fraction	Activity (Bq)	Activity/gram (Bq/gram)	RQ limits (TBq)	RQ Ratios (amount/limit)	A2 Value (TBq)	LTD QTY Det. (amount/(10-4)A2)	Type A Pkg? (amount/A2)	DOT Fissile Mass (g)	TRU Conc. (nCi/g)	LSA-II Liquids Fraction	Activity/gram (pCi/g)
Sr-90	5.47E+01	5.62E+01	2.02E+12	8.36E+04	3.70E-03	5.47E+02	1.00E-01	2.02E+05	2.02E+01	0.00E+00	0.00E+00	8.36E-02	2.26E+06
Cs-137	1.92E+01	3.95E+00	7.11E+11	2.94E+04	3.70E-02	1.92E+01	5.00E-01	1.42E+04	1.42E+00	0.00E+00	0.00E+00	5.87E-03	7.94E+05
Ni-63	2.41E+00	8.25E-03	8.90E+10	3.68E+03	3.70E+00	2.41E-02	3.00E+01	2.97E+01	2.97E-03	0.00E+00	0.00E+00	1.23E-05	9.94E+04
Co-60	4.72E-01	1.21E-01	1.75E+10	7.21E+02	3.70E-01	4.72E-02	4.00E-01	4.36E+02	4.36E-02	0.00E+00	0.00E+00	1.80E-04	1.95E+04
Pu-241	1.72E-01	1.76E+00	6.35E+09	2.62E+02	3.70E-02	1.72E-01	1.00E-02	6.35E+03	6.35E-01	1.72E-03	0.00E+00	2.62E-03	7.09E+03
H-3	1.34E-01	3.45E-04	4.96E+09	2.05E+02	3.70E+00	1.34E-03	4.00E+01	1.24E+00	1.24E-04	0.00E+00	0.00E+00	5.12E-07	5.54E+03
Eu-154	7.91E-02	1.63E-02	2.93E+09	1.21E+02	3.70E-01	7.91E-03	5.00E-01	5.86E+01	5.86E-03	0.00E+00	0.00E+00	2.42E-05	3.27E+03
Eu-152	4.62E-02	5.27E-03	1.71E+09	7.05E+01	3.70E-01	4.62E-03	9.00E-01	1.90E+01	1.90E-03	0.00E+00	0.00E+00	7.84E-06	1.91E+03
Ru-103	4.13E-02	4.72E-03	1.53E+09	6.32E+01	3.70E-01	4.13E-03	9.00E-01	1.70E+01	1.70E-03	0.00E+00	0.00E+00	7.02E-06	1.71E+03
Ce-144	3.42E-02	1.76E-02	1.26E+09	5.22E+01	3.70E-02	3.42E-02	2.00E-01	6.32E+01	6.32E-03	0.00E+00	0.00E+00	2.61E-05	1.41E+03
Ru-106	3.37E-02	1.73E-02	1.25E+09	5.15E+01	3.70E-02	3.37E-02	2.00E-01	6.24E+01	6.24E-03	0.00E+00	0.00E+00	2.58E-05	1.39E+03
Pu-238	3.36E-02	1.73E+01	1.24E+09	5.13E+01	3.70E-04	3.36E+00	2.00E-04	6.21E+04	6.21E+00	1.98E-03	1.39E+00	2.57E-02	1.39E+03
Am-241	1.80E-02	9.26E+00	6.67E+08	2.75E+01	3.70E-04	1.80E+00	2.00E-04	3.33E+04	3.33E+00	0.00E+00	7.44E-01	1.38E-02	7.44E+02
Pu-239	1.74E-02	8.92E+00	6.42E+08	2.65E+01	3.70E-04	1.74E+00	2.00E-04	3.21E+04	3.21E+00	2.80E-01	7.17E-01	1.33E-02	7.17E+02
Sb-125	1.36E-02	1.55E-03	5.03E+08	2.08E+01	3.70E-01	1.36E-03	9.00E-01	5.59E+00	5.59E-04	0.00E+00	0.00E+00	2.31E-06	5.62E+02
Eu-155	1.09E-02	5.60E-04	4.03E+08	1.67E+01	3.70E-01	1.09E-03	2.00E+00	2.02E+00	2.02E-04	0.00E+00	0.00E+00	8.33E-07	4.50E+02
Zr-95	9.36E-03	1.07E-03	3.46E+08	1.43E+01	3.70E-01	9.36E-04	9.00E-01	3.85E+00	3.85E-04	0.00E+00	0.00E+00	1.59E-06	3.86E+02
Nb-95	8.09E-03	8.31E-04	2.99E+08	1.24E+01	3.70E-01	8.09E-04	1.00E+00	2.99E+00	2.99E-04	0.00E+00	0.00E+00	1.24E-06	3.34E+02
Ra-226	7.36E-03	3.78E-02	2.72E+08	1.13E+01	3.70E-03	7.36E-02	2.00E-02	1.36E+02	1.36E-02	0.00E+00	0.00E+00	5.63E-05	3.04E+02
U-233	5.91E-03	6.08E-01	2.19E+08	9.03E+00	3.70E-03	5.91E-02	1.00E-03	2.19E+03	2.19E-01	6.09E-01	0.00E+00	9.03E-04	2.44E+02
Cm-243	5.07E-03	1.74E+00	1.87E+08	7.74E+00	3.70E-04	5.07E-01	3.00E-04	6.25E+03	6.25E-01	0.00E+00	2.09E-01	2.58E-03	2.09E+02
Ag-110m	4.31E-03	1.11E-03	1.60E+08	6.59E+00	3.70E-01	4.31E-04	4.00E-01	3.99E+00	3.99E-04	0.00E+00	0.00E+00	1.65E-06	1.78E+02
Co-58	4.28E-03	4.40E-04	1.58E+08	6.54E+00	3.70E-01	4.28E-04	1.00E+00	1.58E+00	1.58E-04	0.00E+00	0.00E+00	6.54E-07	1.77E+02
Cs-134	3.83E-03	7.88E-04	1.42E+08	5.85E+00	3.70E-02	3.83E-03	5.00E-01	2.84E+00	2.84E-04	0.00E+00	0.00E+00	1.17E-06	1.58E+02
Zn-65	3.78E-03	1.94E-04	1.40E+08	5.77E+00	3.70E-01	3.78E-04	2.00E+00	6.99E-01	6.99E-05	0.00E+00	0.00E+00	2.89E-07	1.56E+02
Ag-108m	2.41E-03	4.13E-04	8.92E+07	3.68E+00	3.70E-01	2.41E-04	6.00E-01	1.49E+00	1.49E-04	0.00E+00	0.00E+00	6.14E-07	9.96E+01
Mn-54	1.52E-03	1.57E-04	5.64E+07	2.33E+00	3.70E-01	1.52E-04	1.00E+00	5.64E-01	5.64E-05	0.00E+00	0.00E+00	2.33E-07	6.29E+01
U-235	1.92E-04	0.00E+00	7.12E+06	2.94E-01	3.70E-03	1.92E-03	Unlimited	0.00E+00	0.00E+00	8.74E+01	0.00E+00	0.00E+00	7.94E+00
I-129	1.82E-04	0.00E+00	6.73E+06	2.78E-01	3.70E-05	1.82E-01	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.51E+00
U-238	1.74E-04	0.00E+00	6.46E+06	2.67E-01	3.70E-03	1.74E-03	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.21E+00
Th-234	1.74E-04	8.97E-05	6.46E+06	2.67E-01	3.70E+00	1.74E-06	2.00E-01	3.23E-01	3.23E-05	0.00E+00	0.00E+00	1.33E-07	7.21E+00
Cm-242	1.21E-04	1.24E-03	4.47E+06	1.85E-01	3.70E-02	1.21E-04	1.00E-02	4.47E+00	4.47E-04	0.00E+00	0.00E+00	1.85E-06	4.99E+00
Np-237	7.54E-05	3.87E-02	2.79E+06	1.15E-01	3.70E-04	7.54E-03	2.00E-04	1.39E+02	1.39E-02	0.00E+00	3.11E-03	5.76E-05	3.11E+00
Pa-233	7.54E-05	8.61E-06	2.79E+06	1.15E-01	3.70E+00	7.54E-07	9.00E-01	3.10E-02	3.10E-06	0.00E+00	0.00E+00	1.28E-08	3.11E+00
Total	7.75E+01	100.00%	2.87E+12	1.18E+05		5.74E+02		3.60E+05	3.60E+01	8.83E+01	3.06E+00	1.49E-01	3.20E+06

DOT regulated as Hazard Class 7 Radioactive Material
Contains a Reportable Quantity of a Hazardous Substance; use 'RQ(radionuclides)' as part of PSN
≥ Type A quantity; requires Type B Packaging
Does NOT meet LTD QTY Exception; Check if LSA
Meets Low Specific Activity (LSA)-II material - Check <Type A quantity and use Radioactive material, LSA, n.o.s. as PSN
>15 grams Fissile Material - use Radioactive material, fissile material, n.o.s. as PSN
This is a Low-level waste

Performed by: Gordon Harris Date: 9/25/01

Reviewed by: _____ Date: _____

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Section III: Check radionuclides for listing on labels and shipping papers

Nuclide	Activity (Ci)	% of Total A2 Fraction	Cumulative A2 Fraction
Sr-90	5.47E+01	5.62E+01	5.62E+01
Pu-238	3.36E-02	1.73E+01	7.35E+01
Am-241	1.80E-02	9.26E+00	8.27E+01
Pu-239	1.74E-02	8.92E+00	9.17E+01
Cs-137	1.92E+01	3.95E+00	9.56E+01
Pu-241	1.72E-01	1.76E+00	9.74E+01
Cm-243	5.07E-03	1.74E+00	9.91E+01
U-233	5.91E-03	6.08E-01	9.97E+01
Co-60	4.72E-01	1.21E-01	9.98E+01
Np-237	7.54E-05	3.87E-02	9.99E+01
Ra-226	7.36E-03	3.78E-02	9.99E+01
Ce-144	3.42E-02	1.76E-02	9.99E+01
Ru-106	3.37E-02	1.73E-02	1.00E+02
Eu-154	7.91E-02	1.63E-02	1.00E+02
Ni-63	2.41E+00	8.25E-03	1.00E+02
Eu-152	4.62E-02	5.27E-03	1.00E+02
Ru-103	4.13E-02	4.72E-03	1.00E+02
Sb-125	1.36E-02	1.55E-03	1.00E+02
Cm-242	1.21E-04	1.24E-03	1.00E+02
Ag-110m	4.31E-03	1.11E-03	1.00E+02
Zr-95	9.36E-03	1.07E-03	1.00E+02
Nb-95	8.09E-03	8.31E-04	1.00E+02
Cs-134	3.83E-03	7.88E-04	1.00E+02
Eu-155	1.09E-02	5.60E-04	1.00E+02
Co-58	4.28E-03	4.40E-04	1.00E+02
Ag-108m	2.41E-03	4.13E-04	1.00E+02
H-3	1.34E-01	3.45E-04	1.00E+02
Zn-65	3.78E-03	1.94E-04	1.00E+02
Mn-54	1.52E-03	1.57E-04	1.00E+02
Th-234	1.74E-04	8.97E-05	1.00E+02
Pa-233	7.54E-05	8.61E-06	1.00E+02
U-235	1.92E-04	0.00E+00	1.00E+02
I-129	1.82E-04	0.00E+00	1.00E+02
U-238	1.74E-04	0.00E+00	1.00E+02

Nuclide	Activity (Ci)	% of Total Activity	Activity Conc. (pCi/g)	Source Material (kg)	SNM (g)	Fraction of Rad Mat License	Activity Conc. (Ci/m3)
Sr-90	5.47E+01	7.06E+01	2.26E+06	Not applicable	Not applicable	9.04E+01	2.23E+00
Cs-137	1.92E+01	2.48E+01	7.94E+05	Not applicable	Not applicable	1.32E+01	7.85E-01
Ni-63	2.41E+00	3.11E+00	9.94E+04	Not applicable	Not applicable	4.52E-02	9.83E-02
Co-60	4.72E-01	6.09E-01	1.95E+04	Not applicable	Not applicable	6.50E-01	1.93E-02
Pu-241	1.72E-01	2.21E-01	7.09E+03	Not applicable	1.72E-03	2.02E-02	7.01E-03
H-3	1.34E-01	1.73E-01	5.54E+03	Not applicable	Not applicable	2.22E-04	5.48E-03
Eu-154	7.91E-02	1.02E-01	3.27E+03	Not applicable	Not applicable	1.09E-01	3.23E-03
Eu-152	4.62E-02	5.96E-02	1.91E+03	Not applicable	Not applicable	9.53E-02	1.88E-03
Ru-103	4.13E-02	5.33E-02	1.71E+03	Not applicable	Not applicable	#DIV/0!	1.69E-03
Ce-144	3.42E-02	4.41E-02	1.41E+03	Not applicable	Not applicable	#DIV/0!	1.39E-03
Ru-106	3.37E-02	4.35E-02	1.39E+03	Not applicable	Not applicable	#DIV/0!	1.38E-03
Pu-238	3.36E-02	4.33E-02	1.39E+03	Not applicable	1.98E-03	1.39E-01	1.37E-03
Am-241	1.80E-02	2.33E-02	7.44E+02	Not applicable	Not applicable	7.44E-02	7.36E-04
Pu-239	1.74E-02	2.24E-02	7.17E+02	Not applicable	2.80E-01	7.17E-02	7.08E-04
Sb-125	1.36E-02	1.75E-02	5.62E+02	Not applicable	Not applicable	#DIV/0!	5.55E-04
Eu-155	1.09E-02	1.41E-02	4.50E+02	Not applicable	Not applicable	1.02E-06	4.45E-04
Zr-95	9.36E-03	1.21E-02	3.86E+02	Not applicable	Not applicable	#DIV/0!	3.82E-04
Nb-95	8.09E-03	1.04E-02	3.34E+02	Not applicable	Not applicable	#DIV/0!	3.30E-04
Ra-226	7.36E-03	9.50E-03	3.04E+02	Not applicable	Not applicable	#DIV/0!	3.01E-04
U-233	5.91E-03	7.63E-03	2.44E+02	Not applicable	6.09E-01	3.26E-03	2.41E-04
Cm-243	5.07E-03	6.54E-03	2.09E+02	Not applicable	Not applicable	2.09E-02	2.07E-04
Ag-110m	4.31E-03	5.56E-03	1.78E+02	Not applicable	Not applicable	#DIV/0!	1.76E-04
Co-58	4.28E-03	5.53E-03	1.77E+02	Not applicable	Not applicable	#DIV/0!	1.75E-04
Cs-134	3.83E-03	4.94E-03	1.58E+02	Not applicable	Not applicable	3.60E-07	1.56E-04
Zn-65	3.78E-03	4.87E-03	1.56E+02	Not applicable	Not applicable	#DIV/0!	1.54E-04
Ag-108m	2.41E-03	3.11E-03	9.96E+01	Not applicable	Not applicable	1.99E-03	9.84E-05
Mn-54	1.52E-03	1.97E-03	6.29E+01	Not applicable	Not applicable	#DIV/0!	6.22E-05
U-235	1.92E-04	2.48E-04	7.94E+00	Not applicable	8.74E+01	4.18E-03	7.85E-06
I-129	1.82E-04	2.35E-04	7.51E+00	Not applicable	Not applicable	2.42E-03	7.42E-06
U-238	1.74E-04	2.25E-04	7.21E+00	Not applicable	Not applicable	2.18E-05	7.12E-06
Th-234	1.74E-04	2.25E-04	7.21E+00	Not applicable	Not applicable	#DIV/0!	7.12E-06
Cm-242	1.21E-04	1.56E-04	4.99E+00	Not applicable	Not applicable	2.50E-06	4.94E-06
Np-237	7.54E-05	9.73E-05	3.11E+00	Not applicable	Not applicable	3.11E-04	3.08E-06
Pa-233	7.54E-05	9.73E-05	3.11E+00	Not applicable	Not applicable	#DIV/0!	3.08E-06

"#DIV/0!" occurring in the Fraction of the Rad Mat License indicates a nuclide not specifically listed in the Envirocare Radioactive Material License but is exempt as a short-lived decay product when it's concentration is equal to the parent.

Waste Classification Determination for near surface disposal per 10 CFR §61.55

Assume that Sr-90, Cs-137, and Ni-63 are major nuclides driving waste classification determination for Tank V-1, V-2, and V-3 wastes

Radionuclide	Table 2 limit (Ci/m^3) Column 1	Column 2	V-3 Tank
Cs-137	1	44	7.85E-01
Sr-90	0.04	150	2.23E+00
Ni-63	3.5	70	9.83E-02
Class A Sum of Fractions:			56.65
Class B Sum of Fractions:			0.03
			Class B

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Container ID # **INEEL V-3 solid and liquid contents (8.5 gal) + clean soil (511.0 gal [2.53 yd^3])**

Note: HIC Liner capacity is 804.9 gallons; assume 64.3% full to meet liner max load limit of 7500 lbs.

Constants	Units
3.70E+10	Bq/Ci
453.6	g/lb
1.00E-12	TBq/Bq or Ci/pCi
1000.00	g/kg
1.00E+09	nCi/Ci

Section I. Waste Stream Information

Container Type: HIC Liner PL8-120 MT Form# N/A NTS Waste Stream # N/A

Description: Homogenous mix + soil PKE# N/A SNL Waste Stream# N/A

Container Gross Wt (lb)	Container Gross Wt (kg)	Container Tare Wt (lb)	Container Tare Wt (kg)	Waste Net Wt (kg)	External Vol. (m3)	Est. Waste Vol. (m3)
7484.00	3394.74	600.00	272.16	3122.58	3.427	1.966

Gross Wt (lb) estimated at 8.5 gal @ 8.25 lb/gal plus 511.0 gal of soil @ 13.351 lb./gal plus tare weight = 7,484 lbs.

Dose rates from *MicroShield v5.01* : 207 mR/hr on contact and 11.4 mR/hr at 1 meter.

Dose survey from Sxxxxx on xx/xx/00 shows 207 mrem/hr OC.

Radioactive liquid effluents from hot cells, labs, and decon facilities at TAN and IETF.

EPA regulated hazardous COCs: Barium, Cadmium, Chromium, Lead, Mercury, Silver, VOCs, SVOCs, and PCBs.

Section II. List the radionuclides and activities; perform DOT RAM, RQ, LTD QTY, and Type A Packaging checks

Nuclide	Activity (Ci)	% of Total A2 Fraction	Activity (Bq)	Activity/gram (Bq/gram)	RQ limits (TBq)	RQ Ratios (amount/limit)	A2 Value (TBq)	LTD QTY Det. (amount/(10-4)A2)	Type A Pkg? (amount/A2)	DOT Fissile Mass (g)	TRU Conc. (nCi/g)	LSA-II Liquids Fraction	Activity/gram (pCi/g)
Sr-90	7.19E-02	5.62E+01	2.66E+09	8.52E+02	3.70E-03	7.19E-01	1.00E-01	2.66E+02	2.66E-02	0.00E+00	0.00E+00	8.52E-04	2.30E+04
Cs-137	2.53E-02	3.95E+00	9.34E+08	2.99E+02	3.70E-02	2.53E-02	5.00E-01	1.87E+01	1.87E-03	0.00E+00	0.00E+00	5.98E-05	8.09E+03
Ni-63	3.16E-03	8.25E-03	1.17E+08	3.75E+01	3.70E+00	3.16E-05	3.00E+01	3.90E-02	3.90E-06	0.00E+00	0.00E+00	1.25E-07	1.01E+03
Co-60	6.20E-04	1.21E-01	2.29E+07	7.35E+00	3.70E-01	6.20E-05	4.00E-01	5.73E-01	5.73E-05	0.00E+00	0.00E+00	1.84E-06	1.99E+02
Pu-241	2.26E-04	1.76E+00	8.34E+06	2.67E+00	3.70E-02	2.26E-04	1.00E-02	8.34E+00	8.34E-04	2.26E-06	0.00E+00	2.67E-05	7.22E+01
H-3	1.76E-04	3.45E-04	6.52E+06	2.09E+00	3.70E+00	1.76E-06	4.00E+01	1.63E-03	1.63E-07	0.00E+00	0.00E+00	5.22E-09	5.64E+01
Eu-154	1.04E-04	1.63E-02	3.85E+06	1.23E+00	3.70E-01	1.04E-05	5.00E-01	7.69E-02	7.69E-06	0.00E+00	0.00E+00	2.46E-07	3.33E+01
Eu-152	6.06E-05	5.27E-03	2.24E+06	7.19E-01	3.70E-01	6.06E-06	9.00E-01	2.49E-02	2.49E-06	0.00E+00	0.00E+00	7.98E-08	1.94E+01
Ru-103	5.43E-05	4.72E-03	2.01E+06	6.43E-01	3.70E-01	5.43E-06	9.00E-01	2.23E-02	2.23E-06	0.00E+00	0.00E+00	7.15E-08	1.74E+01
Ce-144	4.49E-05	1.76E-02	1.66E+06	5.32E-01	3.70E-02	4.49E-05	2.00E-01	8.30E-02	8.30E-06	0.00E+00	0.00E+00	2.66E-07	1.44E+01
Ru-106	4.43E-05	1.73E-02	1.64E+06	5.25E-01	3.70E-02	4.43E-05	2.00E-01	8.20E-02	8.20E-06	0.00E+00	0.00E+00	2.63E-07	1.42E+01
Pu-238	4.41E-05	1.73E+01	1.63E+06	5.23E-01	3.70E-04	4.41E-03	2.00E-04	8.16E+01	8.16E-03	2.60E-06	1.41E-02	2.61E-04	1.41E+01
Am-241	2.37E-05	9.26E+00	8.76E+05	2.81E-01	3.70E-04	2.37E-03	2.00E-04	4.38E+01	4.38E-03	0.00E+00	7.58E-03	1.40E-04	7.58E+00
Pu-239	2.28E-05	8.92E+00	8.43E+05	2.70E-01	3.70E-04	2.28E-03	2.00E-04	4.22E+01	4.22E-03	3.68E-04	7.30E-03	1.35E-04	7.30E+00
Sb-125	1.79E-05	1.55E-03	6.61E+05	2.12E-01	3.70E-01	1.79E-06	9.00E-01	7.35E-03	7.35E-07	0.00E+00	0.00E+00	2.35E-08	5.72E+00
Eu-155	1.43E-05	5.60E-04	5.30E+05	1.70E-01	3.70E-01	1.43E-06	2.00E+00	2.65E-03	2.65E-07	0.00E+00	0.00E+00	8.48E-09	4.58E+00
Zr-95	1.23E-05	1.07E-03	4.55E+05	1.46E-01	3.70E-01	1.23E-06	9.00E-01	5.05E-03	5.05E-07	0.00E+00	0.00E+00	1.62E-08	3.94E+00
Nb-95	1.06E-05	8.31E-04	3.93E+05	1.26E-01	3.70E-01	1.06E-06	1.00E+00	3.93E-03	3.93E-07	0.00E+00	0.00E+00	1.26E-08	3.40E+00
Ra-226	9.68E-06	3.78E-02	3.58E+05	1.15E-01	3.70E-03	9.68E-05	2.00E-02	1.79E-01	1.79E-05	0.00E+00	0.00E+00	5.73E-07	3.10E+00
U-233	7.77E-06	6.08E-01	2.87E+05	9.20E-02	3.70E-03	7.77E-05	1.00E-03	2.87E+00	2.87E-04	8.01E-04	0.00E+00	9.20E-06	2.49E+00
Cm-243	6.65E-06	1.74E+00	2.46E+05	7.89E-02	3.70E-04	6.65E-04	3.00E-04	8.21E+00	8.21E-04	0.00E+00	2.13E-03	2.63E-05	2.13E+00
Ag-110m	5.67E-06	1.11E-03	2.10E+05	6.71E-02	3.70E-01	5.67E-07	4.00E-01	5.24E-03	5.24E-07	0.00E+00	0.00E+00	1.68E-08	1.81E+00
Co-58	5.63E-06	4.40E-04	2.08E+05	6.67E-02	3.70E-01	5.63E-07	1.00E+00	2.08E-03	2.08E-07	0.00E+00	0.00E+00	6.67E-09	1.80E+00
Cs-134	5.03E-06	7.88E-04	1.86E+05	5.96E-02	3.70E-02	5.03E-06	5.00E-01	3.72E-03	3.72E-07	0.00E+00	0.00E+00	1.19E-08	1.61E+00
Zn-65	4.96E-06	1.94E-04	1.84E+05	5.88E-02	3.70E-01	4.96E-07	2.00E+00	9.18E-04	9.18E-08	0.00E+00	0.00E+00	2.94E-09	1.59E+00
Ag-108m	3.17E-06	4.13E-04	1.17E+05	3.75E-02	3.70E-01	3.17E-07	6.00E-01	1.95E-03	1.95E-07	0.00E+00	0.00E+00	6.26E-09	1.01E+00
Mn-54	2.00E-06	1.57E-04	7.41E+04	2.37E-02	3.70E-01	2.00E-07	1.00E+00	7.41E-04	7.41E-08	0.00E+00	0.00E+00	2.37E-09	6.41E-01
U-235	2.53E-07	0.00E+00	9.35E+03	2.99E-03	3.70E-03	2.53E-06	Unlimited	0.00E+00	0.00E+00	1.15E-01	0.00E+00	0.00E+00	8.09E-02
I-129	2.39E-07	0.00E+00	8.84E+03	2.83E-03	3.70E-05	2.39E-04	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.65E-02
U-238	2.29E-07	0.00E+00	8.48E+03	2.72E-03	3.70E-03	2.29E-06	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.34E-02
Th-234	2.29E-07	8.97E-05	8.48E+03	2.72E-03	3.70E+00	2.29E-09	2.00E-01	4.24E-04	4.24E-08	0.00E+00	0.00E+00	1.36E-09	7.34E-02
Cm-242	1.59E-07	1.24E-03	5.88E+03	1.88E-03	3.70E-02	1.59E-07	1.00E-02	5.88E-03	5.88E-07	0.00E+00	0.00E+00	1.88E-08	5.09E-02
Pa-233	9.90E-08	8.61E-06	3.66E+03	1.17E-03	3.70E+00	9.90E-10	9.00E-01	4.07E-05	4.07E-09	0.00E+00	0.00E+00	1.30E-10	3.17E-02
Np-237	9.90E-08	3.87E-02	3.66E+03	1.17E-03	3.70E-04	9.90E-06	2.00E-04	1.83E-01	1.83E-05	0.00E+00	3.17E-05	5.87E-07	3.17E-02
Total	1.02E-01	100.00%	3.77E+09	1.21E+03		7.55E-01		4.73E+02	4.73E-02	1.16E-01	3.12E-02	1.51E-03	3.26E+04

DOT regulated as Hazard Class 7 Radioactive Material
NOT an RQ amount of a Hazardous Substance
< Type A quantity/package per 49 CFR 173.431(a); check if excepted quantity -> excepted packaging
Does NOT meet LTD QTY Exception; Check if LSA
Meets Low Specific Activity (LSA)-II material - Check <Type A quantity and use Radioactive material, LSA, n.o.s. as PSN
Meets criteria for Fissile Excepted Package per 49 CFR 173.453
This is a Low-level waste

Performed by: Gordon Harris Date: 9/25/01

Reviewed by: _____ Date: _____

Section III: Check radionuclides for listing on labels and shipping papers

Nuclide	Activity (Ci)	% of Total A2 Fraction	Cumulative A2 Fraction
Sr-90	7.19E-02	5.62E+01	5.62E+01
Pu-238	4.41E-05	1.73E+01	7.35E+01
Am-241	2.37E-05	9.26E+00	8.27E+01
Pu-239	2.28E-05	8.92E+00	9.17E+01
Cs-137	2.53E-02	3.95E+00	9.56E+01
Pu-241	2.26E-04	1.76E+00	9.74E+01
Cm-243	6.65E-06	1.74E+00	9.91E+01
U-233	7.77E-06	6.08E-01	9.97E+01
Co-60	6.20E-04	1.21E-01	9.98E+01
Np-237	9.90E-08	3.87E-02	9.99E+01
Ra-226	9.68E-06	3.78E-02	9.99E+01
Ce-144	4.49E-05	1.76E-02	9.99E+01
Ru-106	4.43E-05	1.73E-02	1.00E+02
Eu-154	1.04E-04	1.63E-02	1.00E+02
Ni-63	3.16E-03	8.25E-03	1.00E+02
Eu-152	6.06E-05	5.27E-03	1.00E+02
Ru-103	5.43E-05	4.72E-03	1.00E+02
Sb-125	1.79E-05	1.55E-03	1.00E+02
Cm-242	1.59E-07	1.24E-03	1.00E+02
Ag-110m	5.67E-06	1.11E-03	1.00E+02
Zr-95	1.23E-05	1.07E-03	1.00E+02
Nb-95	1.06E-05	8.31E-04	1.00E+02
Cs-134	5.03E-06	7.88E-04	1.00E+02
Eu-155	1.43E-05	5.60E-04	1.00E+02
Co-58	5.63E-06	4.40E-04	1.00E+02
Ag-108m	3.17E-06	4.13E-04	1.00E+02
H-3	1.76E-04	3.45E-04	1.00E+02
Zn-65	4.96E-06	1.94E-04	1.00E+02
Mn-54	2.00E-06	1.57E-04	1.00E+02
Th-234	2.29E-07	8.97E-05	1.00E+02
Pa-233	9.90E-08	8.61E-06	1.00E+02
U-235	2.53E-07	0.00E+00	1.00E+02
I-129	2.39E-07	0.00E+00	1.00E+02
U-238	2.29E-07	0.00E+00	1.00E+02

Nuclide	Activity (Ci)	% of Total Activity	Activity Conc. (pCi/g)	Source Material (kg)	SNM (g)	[redacted]	Activity Conc. (Ci/m3)
Sr-90	7.19E-02	7.06E+01	2.30E+04	Not applicable	Not applicable	9.21E-01	3.66E-02
Cs-137	2.53E-02	2.48E+01	8.09E+03	Not applicable	Not applicable	1.35E-01	1.28E-02
Ni-63	3.16E-03	3.11E+00	1.01E+03	Not applicable	Not applicable	4.60E-04	1.61E-03
Co-60	6.20E-04	6.09E-01	1.99E+02	Not applicable	Not applicable	6.62E-03	3.15E-04
Pu-241	2.26E-04	2.21E-01	7.22E+01	Not applicable	2.26E-06	2.06E-04	1.15E-04
H-3	1.76E-04	1.73E-01	5.64E+01	Not applicable	Not applicable	2.26E-06	8.96E-05
Eu-154	1.04E-04	1.02E-01	3.33E+01	Not applicable	Not applicable	1.11E-03	5.29E-05
Eu-152	6.06E-05	5.96E-02	1.94E+01	Not applicable	Not applicable	9.71E-04	3.08E-05
Ru-103	5.43E-05	5.33E-02	1.74E+01	Not applicable	Not applicable	#DIV/0!	2.76E-05
Ce-144	4.49E-05	4.41E-02	1.44E+01	Not applicable	Not applicable	#DIV/0!	2.28E-05
Ru-106	4.43E-05	4.35E-02	1.42E+01	Not applicable	Not applicable	#DIV/0!	2.25E-05
Pu-238	4.41E-05	4.33E-02	1.41E+01	Not applicable	2.60E-06	1.41E-03	2.24E-05
Am-241	2.37E-05	2.33E-02	7.58E+00	Not applicable	Not applicable	7.58E-04	1.20E-05
Pu-239	2.28E-05	2.24E-02	7.30E+00	Not applicable	3.68E-04	7.30E-04	1.16E-05
Sb-125	1.79E-05	1.75E-02	5.72E+00	Not applicable	Not applicable	#DIV/0!	9.09E-06
Eu-155	1.43E-05	1.41E-02	4.58E+00	Not applicable	Not applicable	1.04E-08	7.28E-06
Zr-95	1.23E-05	1.21E-02	3.94E+00	Not applicable	Not applicable	#DIV/0!	6.25E-06
Nb-95	1.06E-05	1.04E-02	3.40E+00	Not applicable	Not applicable	#DIV/0!	5.40E-06
Ra-226	9.68E-06	9.50E-03	3.10E+00	Not applicable	Not applicable	#DIV/0!	4.92E-06
U-233	7.77E-06	7.63E-03	2.49E+00	Not applicable	8.01E-04	3.32E-05	3.95E-06
Cm-243	6.65E-06	6.54E-03	2.13E+00	Not applicable	Not applicable	2.13E-04	3.38E-06
Ag-110m	5.67E-06	5.56E-03	1.81E+00	Not applicable	Not applicable	#DIV/0!	2.88E-06
Co-58	5.63E-06	5.53E-03	1.80E+00	Not applicable	Not applicable	#DIV/0!	2.86E-06
Cs-134	5.03E-06	4.94E-03	1.61E+00	Not applicable	Not applicable	3.66E-09	2.56E-06
Zn-65	4.96E-06	4.87E-03	1.59E+00	Not applicable	Not applicable	#DIV/0!	2.52E-06
Ag-108m	3.17E-06	3.11E-03	1.01E+00	Not applicable	Not applicable	2.03E-05	1.61E-06
Mn-54	2.00E-06	1.97E-03	6.41E-01	Not applicable	Not applicable	#DIV/0!	1.02E-06
U-235	2.53E-07	2.48E-04	8.09E-02	Not applicable	1.15E-01	4.26E-05	1.29E-07
I-129	2.39E-07	2.35E-04	7.65E-02	Not applicable	Not applicable	2.47E-05	1.22E-07
U-238	2.29E-07	2.25E-04	7.34E-02	Not applicable	Not applicable	2.22E-07	1.17E-07
Th-234	2.29E-07	2.25E-04	7.34E-02	Not applicable	Not applicable	#DIV/0!	1.17E-07
Cm-242	1.59E-07	1.56E-04	5.09E-02	Not applicable	Not applicable	2.54E-08	8.08E-08
Pa-233	9.90E-08	9.73E-05	3.17E-02	Not applicable	Not applicable	#DIV/0!	5.04E-08
Np-237	9.90E-08	9.73E-05	3.17E-02	Not applicable	Not applicable	3.17E-06	5.04E-08

"#DIV/0!" occurring in the Fraction of the Rad Mat License indicates a nuclide not specifically listed in the Envirocare Radioactive Material License but is exempt as a short-lived decay product when it's concentration is equal to the parent.

Waste Classification Determination for near surface disposal per 10 CFR §61.55

Assume that Sr 90, Cs 137, and Ni 63 are major nuclides driving waste classification determination for Tank V 1, V 2, and V 3 wastes

Radionuclide	Table 2 limit (Ci/m^3) Column 1	Column 2	V-3 8.5 gal/HIC
Cs-137	1	44	1.28E-02
Sr-90	0.04	150	3.66E-02
Ni-63	3.5	70	1.61E-03

Class A Sum of Fractions: 0.93
Class B Sum of Fractions: 0.00
Class A

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Container ID # **INEEL V-9 solid and liquid contents whole tank**

Constants	Units
3.70E+10	Bq/Ci
453.6	g/lb
1.00E-12	TBq/Bq or Ci/pCi
1000.00	g/kg
1.00E+09	nCi/Ci

Section I. Waste Stream Information

Container Type: V-9 Tank Form# N/A
Description: Homogenous mix PKE# N/A

NTS Waste Stream # N/A
SNL Waste Stream# N/A

Container Gross Wt (lb)	Container Gross Wt (kg)	Container Tare Wt (lb)	Container Tare Wt (kg)	Waste Net Wt (kg)	External Vol. (m3)	Est. Waste Vol. (m3)
2640.00	1197.50	0.00	0.00	1197.50	1.520	1.211

Gross Wt (lb) estimated for contents only at 320 gal @ 8.25 lb/gal -> 2,640 lbs.

Dose rates from *MicroShield v5.01* : 2490 mR/hr on contact and 115 mR/hr at 1 meter.
Dose survey from Sxxxxx on xx/xx/00 shows 2490 mrem/hr OC.
Radioactive liquid effluents from hot cells, labs, and decon facilities at TAN and IETF.
EPA regulated hazardous COCs: Barium, Cadmium, Chromium, Lead, Mercury, Silver, VOCs, SVOCs, and PCBs.

Section II. List the radionuclides and activities; perform DOT RAM, RQ, LTD QTY, and Type A Packaging checks

Nuclide	Activity (Ci)	% of Total A2 Fraction	Activity (Bq)	Activity/gram (Bq/gram)	RQ limits (TBq)	RQ Ratios (amount/limit)	A2 Value (TBq)	LTD QTY Det. (amount/(10-4)A2)	Type A Pkg? (amount/A2)	DOT Fissile Mass (g)	TRU Conc. (nCi/g)	LSA-II Liquids Fraction	Activity/gram (pCi/g)
Sr-90	6.25E+00	2.50E+01	2.31E+11	1.93E+05	3.70E-03	6.25E+01	1.00E-01	2.31E+04	2.31E+00	0.00E+00	0.00E+00	1.93E-01	5.22E+06
Cs-137	5.40E+00	4.31E+00	2.00E+11	1.67E+05	3.70E-02	5.40E+00	5.00E-01	3.99E+03	3.99E-01	0.00E+00	0.00E+00	3.33E-02	4.51E+06
Co-60	9.10E-01	9.10E-01	3.37E+10	2.81E+04	3.70E-01	9.10E-02	4.00E-01	8.42E+02	8.42E-02	0.00E+00	0.00E+00	7.03E-03	7.60E+05
H-3	9.35E-02	9.35E-04	3.46E+09	2.89E+03	3.70E+00	9.35E-04	4.00E+01	8.65E-01	8.65E-05	0.00E+00	0.00E+00	7.23E-06	7.81E+04
Pu-241	4.61E-02	1.84E+00	1.70E+09	1.42E+03	3.70E-02	4.61E-02	1.00E-02	1.70E+03	1.70E-01	4.61E-04	0.00E+00	1.42E-02	3.85E+04
Eu-154	2.14E-02	1.71E-02	7.93E+08	6.62E+02	3.70E-01	2.14E-03	5.00E-01	1.59E+01	1.59E-03	0.00E+00	0.00E+00	1.32E-04	1.79E+04
Pu-238	1.94E-02	3.88E+01	7.18E+08	5.99E+02	3.70E-04	1.94E+00	2.00E-04	3.59E+04	3.59E+00	1.14E-03	1.62E+01	3.00E-01	1.62E+04
U-234	9.80E-03	3.92E+00	3.62E+08	3.03E+02	3.70E-03	9.80E-02	1.00E-03	3.62E+03	3.62E-01	0.00E+00	0.00E+00	3.03E-02	8.18E+03
Pu-239	7.04E-03	1.41E+01	2.60E+08	2.17E+02	3.70E-04	7.04E-01	2.00E-04	1.30E+04	1.30E+00	1.14E-01	5.88E+00	1.09E-01	5.88E+03
Am-241	4.84E-03	9.67E+00	1.79E+08	1.49E+02	3.70E-04	4.84E-01	2.00E-04	8.95E+03	8.95E-01	0.00E+00	4.04E+00	7.47E-02	4.04E+03
U-233	2.11E-03	8.43E-01	7.81E+07	6.52E+01	3.70E-03	2.11E-02	1.00E-03	7.81E+02	7.81E-02	2.17E-01	0.00E+00	6.52E-03	1.76E+03
Cm-244	5.60E-04	5.60E-01	2.07E+07	1.73E+01	3.70E-04	5.60E-02	4.00E-04	5.18E+02	5.18E-02	0.00E+00	0.00E+00	4.32E-03	4.67E+02
U-235	3.42E-04	0.00E+00	1.27E+07	1.06E+01	3.70E-03	3.42E-03	Unlimited	0.00E+00	0.00E+00	1.55E+02	0.00E+00	0.00E+00	2.86E+02
U-236	9.11E-05	3.64E-02	3.37E+06	2.82E+00	3.70E-03	9.11E-04	1.00E-03	3.37E+01	3.37E-03	0.00E+00	0.00E+00	2.82E-04	7.61E+01
Th-234	7.78E-05	1.56E-04	2.88E+06	2.40E+00	3.70E+00	7.78E-07	2.00E-01	1.44E-01	1.44E-05	0.00E+00	0.00E+00	1.20E-06	6.50E+01
U-238	7.78E-05	0.00E+00	2.88E+06	2.40E+00	3.70E-03	7.78E-04	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.50E+01
Np-237	2.93E-05	5.85E-02	1.08E+06	9.04E-01	3.70E-04	2.93E-03	2.00E-04	5.41E+01	5.41E-03	0.00E+00	2.44E-02	4.52E-04	2.44E+01
Pa-233	2.93E-05	1.30E-05	1.08E+06	9.04E-01	3.70E+00	2.93E-07	9.00E-01	1.20E-02	1.20E-06	0.00E+00	0.00E+00	1.00E-07	2.44E+01
Eu-152	1.50E-07	6.66E-08	5.55E+03	4.63E-03	3.70E-01	1.50E-08	9.00E-01	6.17E-05	6.17E-09	0.00E+00	0.00E+00	5.15E-10	1.25E-01
Total	1.28E+01	100.00%	4.72E+11	3.94E+05		7.13E+01		9.25E+04	9.25E+00	1.56E+02	2.61E+01	7.73E-01	1.07E+07

DOT regulated as Hazard Class 7 Radioactive Material
Contains a Reportable Quantity of a Hazardous Substance; use 'RQ(radionuclides)' as part of PSN
≥ Type A quantity; requires Type B Packaging
Does NOT meet LTD QTY Exception; Check if LSA
Meets Low Specific Activity (LSA)-II material - Check <Type A quantity and use Radioactive material, LSA, n.o.s. as PSN
>15 grams Fissile Material - use Radioactive material, fissile material, n.o.s. as PSN
This is a Low-level waste

Performed by: [signature] Date: 9/25/01

Reviewed by: Date:

Section III: Check radionuclides for listing on labels and shipping papers

Nuclide	Activity (Ci)	% of Total A2 Fraction	Cumulative A2 Fraction
Pu-238	1.94E-02	3.88E+01	3.88E+01
Sr-90	6.25E+00	2.50E+01	6.38E+01
Pu-239	7.04E-03	1.41E+01	7.78E+01
Am-241	4.84E-03	9.67E+00	8.75E+01
Cs-137	5.40E+00	4.31E+00	9.18E+01
U-234	9.80E-03	3.92E+00	9.57E+01
Pu-241	4.61E-02	1.84E+00	9.76E+01
Co-60	9.10E-01	9.10E-01	9.85E+01
U-233	2.11E-03	8.43E-01	9.93E+01
Cm-244	5.60E-04	5.60E-01	9.99E+01
Np-237	2.93E-05	5.85E-02	9.99E+01
U-236	9.11E-05	3.64E-02	1.00E+02
Eu-154	2.14E-02	1.71E-02	1.00E+02
H-3	9.35E-02	9.35E-04	1.00E+02
Th-234	7.78E-05	1.56E-04	1.00E+02
Pa-233	2.93E-05	1.30E-05	1.00E+02
Eu-152	1.50E-07	6.66E-08	1.00E+02
U-235	3.42E-04	0.00E+00	1.00E+02
U-238	7.78E-05	0.00E+00	1.00E+02

Nuclide	Activity (Ci)	% of Total Activity	Activity Conc. (pCi/g)	Source Material (kg)	SNM (g)	Fraction of Rad Mat License	Activity Conc. (Ci/m3)
Sr-90	6.25E+00	4.90E+01	5.22E+06	Not applicable	Not applicable	2.09E+02	5.16E+00
Cs-137	5.40E+00	4.23E+01	4.51E+06	Not applicable	Not applicable	7.51E+01	4.46E+00
Co-60	9.10E-01	7.13E+00	7.60E+05	Not applicable	Not applicable	2.53E+01	7.52E-01
H-3	9.35E-02	7.33E-01	7.81E+04	Not applicable	Not applicable	3.12E-03	7.72E-02
Pu-241	4.61E-02	3.61E-01	3.85E+04	Not applicable	4.61E-04	1.10E-01	3.80E-02
Eu-154	2.14E-02	1.68E-01	1.79E+04	Not applicable	Not applicable	5.96E-01	1.77E-02
Pu-238	1.94E-02	1.52E-01	1.62E+04	Not applicable	1.14E-03	1.62E+00	1.60E-02
U-234	9.80E-03	7.68E-02	8.18E+03	Not applicable	Not applicable	2.21E-02	8.09E-03
Pu-239	7.04E-03	5.52E-02	5.88E+03	Not applicable	1.14E-01	5.88E-01	5.81E-03
Am-241	4.84E-03	3.79E-02	4.04E+03	Not applicable	Not applicable	4.04E-01	3.99E-03
U-233	2.11E-03	1.65E-02	1.76E+03	Not applicable	2.17E-01	2.35E-02	1.74E-03
Cm-244	5.60E-04	4.39E-03	4.67E+02	Not applicable	Not applicable	4.67E-02	4.62E-04
U-235	3.42E-04	2.68E-03	2.86E+02	Not applicable	1.55E+02	1.50E-01	2.82E-04
U-236	9.11E-05	7.14E-04	7.61E+01	Not applicable	Not applicable	2.00E-04	7.52E-05
Th-234	7.78E-05	6.10E-04	6.50E+01	Not applicable	Not applicable	#DIV/0!	6.43E-05
U-238	7.78E-05	6.10E-04	6.50E+01	Not applicable	Not applicable	1.97E-04	6.43E-05
Np-237	2.93E-05	2.29E-04	2.44E+01	Not applicable	Not applicable	2.44E-03	2.42E-05
Pa-233	2.93E-05	2.29E-04	2.44E+01	Not applicable	Not applicable	#DIV/0!	2.42E-05
Eu-152	1.50E-07	1.18E-06	1.25E-01	Not applicable	Not applicable	6.26E-06	1.24E-07

"#DIV/0!" occurring in the Fraction of the Rad Mat License indicates a nuclide not specifically listed in the Envirocare Radioactive Material License but is exempt as a short-lived decay product when it's concentration is equal to the parent.

Waste Classification Determination for near surface disposal per 10 CFR §61.55

Assume that Sr-90, Cs-137, Co-60, and H-3 are major nuclides driving waste classification determination for Tank V-9 wastes

Radionuclide	Table 2 limit (Ci/m^3) Column 1	Column 2	V-9 Tank
Sr-90	0.04	150	5.16E+00
Cs-137	1	44	4.46E+00
Co-60	700	*	7.52E-01
H-3	40	*	7.72E-02

Class A Sum of Fractions: 133.46
Class B Sum of Fractions: 0.14
Class B*

*Note: No limits established for these radionuclides in Class B or C wastes. Practical considerations such as the effects of external radiation and internal heat generation on transportation, handling, and disposal will limit the concentrations for these wastes. These wastes shall be Class B unless the concentrations of other nuclides in Table 2 determine the waste to be Class C independent of these nuclides.

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Container ID # **INEEL V-9 solid and liquid contents (3.5 gal) + clean soil (514.0 gal [2.54 yd^3])**
Note: HIC Liner capacity is 804.9 gallons; assume 64.3% full to meet liner max load limit of 7500 lbs.

Constants	Units
3.70E+10	Bq/Ci
453.6	g/lb
1.00E-12	TBq/Bq or Ci/pCi
1000.00	g/kg
1.00E+09	nCi/Ci

Section I. Waste Stream Information

Container Type: HIC Liner PL8-120 MT Form# N/A NTS Waste Stream # N/A
Description: Homogenous mix + soil PKE# N/A SNL Waste Stream# N/A

Container Gross Wt (lb)	Container Gross Wt (kg)	Container Tare Wt (lb)	Container Tare Wt (kg)	Waste Net Wt (kg)	External Vol. (m3)	Est. Waste Vol. (m3)
7491.30	3398.05	600.00	272.16	3125.89	3.427	1.959

Dose rates from *MicroShield v5.01*: 2490 mR/hr on contact and 115 mR/hr at 1 meter.
Dose survey from Sxxxxx on xx/xx/00 shows 2490 mrem/hr OC.
Radioactive liquid effluents from hot cells, labs, and decon facilities at TAN and IETF.
EPA regulated hazardous COCs: Barium, Cadmium, Chromium, Lead, Mercury, Silver, VOCs, SVOCs, and PCBs.

Gross Wt (lb) estimated at 3.5 gal @ 8.25 lb/gal plus 514.0 gal of soil @ 13.351 lb./gal plus tare weight = 7,491.3 lbs.

Section II. List the radionuclides and activities; perform DOT RAM, RQ, LTD QTY, and Type A Packaging checks

Nuclide	Activity (Ci)	% of Total A2 Fraction	Activity (Bq)	Activity/gram (Bq/gram)	RQ limits (TBq)	RQ Ratios (amount/limit)	A2 Value (TBq)	LTD QTY Det. (amount/(10-4)A2)	Type A Pkg? (amount/A2)	DOT Fissile Mass (g)	TRU Conc. (nCi/g)	LSA-II Liquids Fraction	Activity/gram (pCi/g)
Sr-90	6.83E-02	2.50E+01	2.53E+09	8.09E+02	3.70E-03	6.83E-01	1.00E-01	2.53E+02	2.53E-02	0.00E+00	0.00E+00	8.09E-04	2.19E+04
Cs-137	5.90E-02	4.31E+00	2.18E+09	6.99E+02	3.70E-02	5.90E-02	5.00E-01	4.37E+01	4.37E-03	0.00E+00	0.00E+00	1.40E-04	1.89E+04
Co-60	9.96E-03	9.10E-01	3.68E+08	1.18E+02	3.70E-01	9.96E-04	4.00E-01	9.21E+00	9.21E-04	0.00E+00	0.00E+00	2.95E-05	3.19E+03
H-3	1.02E-03	9.35E-04	3.79E+07	1.21E+01	3.70E+00	1.02E-05	4.00E+01	9.46E-03	9.46E-07	0.00E+00	0.00E+00	3.03E-08	3.27E+02
Pu-241	5.04E-04	1.84E+00	1.86E+07	5.96E+00	3.70E-02	5.04E-04	1.00E-02	1.86E+01	1.86E-03	5.04E-06	0.00E+00	5.96E-05	1.61E+02
Eu-154	2.34E-04	1.71E-02	8.67E+06	2.77E+00	3.70E-01	2.34E-05	5.00E-01	1.73E-01	1.73E-05	0.00E+00	0.00E+00	5.55E-07	7.50E+01
Pu-238	2.12E-04	3.88E+01	7.85E+06	2.51E+00	3.70E-04	2.12E-02	2.00E-04	3.93E+02	3.93E-02	1.25E-05	6.79E-02	1.26E-03	6.79E+01
U-234	1.07E-04	3.92E+00	3.96E+06	1.27E+00	3.70E-03	1.07E-03	1.00E-03	3.96E+01	3.96E-03	0.00E+00	0.00E+00	1.27E-04	3.43E+01
Pu-239	7.70E-05	1.41E+01	2.85E+06	9.11E-01	3.70E-04	7.70E-03	2.00E-04	1.42E+02	1.42E-02	1.24E-03	2.46E-02	4.56E-04	2.46E+01
Am-241	5.29E-05	9.67E+00	1.96E+06	6.26E-01	3.70E-04	5.29E-03	2.00E-04	9.79E+01	9.79E-03	0.00E+00	1.69E-02	3.13E-04	1.69E+01
U-233	2.31E-05	8.43E-01	8.54E+05	2.73E-01	3.70E-03	2.31E-04	1.00E-03	8.54E+00	8.54E-04	2.38E-03	0.00E+00	2.73E-05	7.38E+00
Cm-244	6.12E-06	5.60E-01	2.27E+05	7.25E-02	3.70E-04	6.12E-04	4.00E-04	5.66E+00	5.66E-04	0.00E+00	0.00E+00	1.81E-05	1.96E+00
U-235	3.74E-06	0.00E+00	1.38E+05	4.43E-02	3.70E-03	3.74E-05	Unlimited	0.00E+00	0.00E+00	1.70E+00	0.00E+00	0.00E+00	1.20E+00
U-236	9.97E-07	3.64E-02	3.69E+04	1.18E-02	3.70E-03	9.97E-06	1.00E-03	3.69E-01	3.69E-05	0.00E+00	0.00E+00	1.18E-06	3.19E-01
Th-234	8.51E-07	1.56E-04	3.15E+04	1.01E-02	3.70E+00	8.51E-09	2.00E-01	1.57E-03	1.57E-07	0.00E+00	0.00E+00	5.04E-09	2.72E-01
U-238	8.51E-07	0.00E+00	3.15E+04	1.01E-02	3.70E-03	8.51E-06	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.72E-01
Pa-233	3.20E-07	1.30E-05	1.18E+04	3.79E-03	3.70E+00	3.20E-09	9.00E-01	1.32E-04	1.32E-08	0.00E+00	0.00E+00	4.21E-10	1.02E-01
Np-237	3.20E-07	5.85E-02	1.18E+04	3.79E-03	3.70E-04	3.20E-05	2.00E-04	5.92E-01	5.92E-05	0.00E+00	1.02E-04	1.89E-06	1.02E-01
Eu-152	1.64E-09	6.66E-08	6.07E+01	1.94E-05	3.70E-01	1.64E-10	9.00E-01	6.74E-07	6.74E-11	0.00E+00	0.00E+00	2.16E-12	5.25E-04
Total	1.40E-01	100.00%	5.16E+09	1.65E+03		7.80E-01		1.01E+03	1.01E-01	1.70E+00	1.10E-01	3.24E-03	4.47E+04

DOT regulated as Hazard Class 7 Radioactive Material
NOT an RQ amount of a Hazardous Substance
< Type A quantity/package per 49 CFR 173.431(a); check if excepted quantity -> excepted packaging
Does NOT meet LTD QTY Exception; Check if LSA
Meets Low Specific Activity (LSA)-II material - Check <Type A quantity and use Radioactive material, LSA, n.o.s. as PSN
Meets criteria for Fissile Excepted Package per 49 CFR 173.453
This is a Low-level waste

Performed by: Gordon Harris Date: 9/25/01
Reviewed by: Date:

Section III: Check radionuclides for listing on labels and shipping papers

Nuclide	Activity (Ci)	% of Total A2 Fraction	Cumulative A2 Fraction
Pu-238	2.12E-04	3.88E+01	3.88E+01
Sr-90	6.83E-02	2.50E+01	6.38E+01
Pu-239	7.70E-05	1.41E+01	7.78E+01
Am-241	5.29E-05	9.67E+00	8.75E+01
Cs-137	5.90E-02	4.31E+00	9.18E+01
U-234	1.07E-04	3.92E+00	9.57E+01
Pu-241	5.04E-04	1.84E+00	9.76E+01
Co-60	9.96E-03	9.10E-01	9.85E+01
U-233	2.31E-05	8.43E-01	9.93E+01
Cm-244	6.12E-06	5.60E-01	9.99E+01
Np-237	3.20E-07	5.85E-02	9.99E+01
U-236	9.97E-07	3.64E-02	1.00E+02
Eu-154	2.34E-04	1.71E-02	1.00E+02
H-3	1.02E-03	9.35E-04	1.00E+02
Th-234	8.51E-07	1.56E-04	1.00E+02
Pa-233	3.20E-07	1.30E-05	1.00E+02
Eu-152	1.64E-09	6.66E-08	1.00E+02
U-235	3.74E-06	0.00E+00	1.00E+02
U-238	8.51E-07	0.00E+00	1.00E+02

Nuclide	Activity (Ci)	% of Total Activity	Activity Conc. (pCi/g)	Source Material (kg)	[redacted] (g)	[redacted]	Activity Conc. (Ci/m3)
Sr-90	6.83E-02	4.90E+01	2.19E+04	Not applicable	Not applicable	8.75E-01	3.49E-02
Cs-137	5.90E-02	4.23E+01	1.89E+04	Not applicable	Not applicable	3.15E-01	3.01E-02
Co-60	9.96E-03	7.13E+00	3.19E+03	Not applicable	Not applicable	1.06E-01	5.08E-03
H-3	1.02E-03	7.33E-01	3.27E+02	Not applicable	Not applicable	1.31E-05	5.22E-04
Pu-241	5.04E-04	3.61E-01	1.61E+02	Not applicable	5.04E-06	4.60E-04	2.57E-04
Eu-154	2.34E-04	1.68E-01	7.50E+01	Not applicable	Not applicable	2.50E-03	1.20E-04
Pu-238	2.12E-04	1.52E-01	6.79E+01	Not applicable	1.25E-05	6.79E-03	1.08E-04
U-234	1.07E-04	7.68E-02	3.43E+01	Not applicable	Not applicable	9.26E-05	5.47E-05
Pu-239	7.70E-05	5.52E-02	2.46E+01	Not applicable	1.24E-03	2.46E-03	3.93E-05
Am-241	5.29E-05	3.79E-02	1.69E+01	Not applicable	Not applicable	1.69E-03	2.70E-05
U-233	2.31E-05	1.65E-02	7.38E+00	Not applicable	2.38E-03	9.84E-05	1.18E-05
Cm-244	6.12E-06	4.39E-03	1.96E+00	Not applicable	Not applicable	1.96E-04	3.13E-06
U-235	3.74E-06	2.68E-03	1.20E+00	Not applicable	1.70E+00	6.30E-04	1.91E-06
U-236	9.97E-07	7.14E-04	3.19E-01	Not applicable	Not applicable	8.39E-07	5.09E-07
Th-234	8.51E-07	6.10E-04	2.72E-01	Not applicable	Not applicable	#DIV/0!	4.35E-07
U-238	8.51E-07	6.10E-04	2.72E-01	Not applicable	Not applicable	8.25E-07	4.34E-07
Pa-233	3.20E-07	2.29E-04	1.02E-01	Not applicable	Not applicable	#DIV/0!	1.63E-07
Np-237	3.20E-07	2.29E-04	1.02E-01	Not applicable	Not applicable	1.02E-05	1.63E-07
Eu-152	1.64E-09	1.18E-06	5.25E-04	Not applicable	Not applicable	2.62E-08	8.37E-10

"#DIV/0!" occurring in the Fraction of the Rad Mat License indicates a nuclide not specifically listed in the Envirocare Radioactive Material License but is exempt as a short-lived decay product when it's concentration is equal to the parent.

Waste Classification Determination for near surface disposal per 10 CFR §61.55

Assume that Sr-90, Cs-137, Co-60, and H-3 are major nuclides driving waste classification determination for Tank V-9 wastes

Radionuclide	Table 2 limit (Ci/m^3) Column 1	Column 2	V-9 3.5 gal
Sr-90	0.04	150	3.49E-02
Cs-137	1	44	3.01E-02
Co-60	700	*	5.08E-03
H-3	40	*	5.22E-04

*Note: No limits established for these radionuclides in Class A or C waste. Internal radiation dose, such as the effects of external radiation and internal heat generation, during transportation, handling, and disposal will limit the concentration for these waste. These wastes shall be classified A unless the concentration of other nuclides in Table 2 determine the waste to be Class C independent of these nuclides.

Class A Sum of Fractions: 0.90
Class B Sum of Fractions: 0.00
Class A*

HH 9/25