



DEFENSE LOGISTICS AGENCY
DEFENSE NATIONAL STOCKPILE CENTER
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IN REPLY
REFER TO

DNSC-E

Q-5
MS-16

OCT 04 2005

Nuclear Regulatory Commission
US NRC Region 1
ATTN: Ms. Elizabeth Ullrich, Senior
Health Physicist
475 Allendale Road
King of Prussia, PA 19406

STC-133
No. 040-00341
Control No. 136268

2005 OCT 11 PM 1:31
RECEIVED

Dear Ms. Ullrich:

Attached are the additional items of information you requested in your Email to me dated October 3, 2005. I hope this information resolves your data gaps and you have all the information you need.

Should you require additional information or wish to discuss this matter further please feel free to contact me or Mr. Mike Pecullan of my staff at (703)767-7620.

Thank you for your cooperation and assistance.

Sincerely,

F. KEVIN REILLY
Director,
Directorate of Environmental
and Safety Management Division

Attachments



301-B

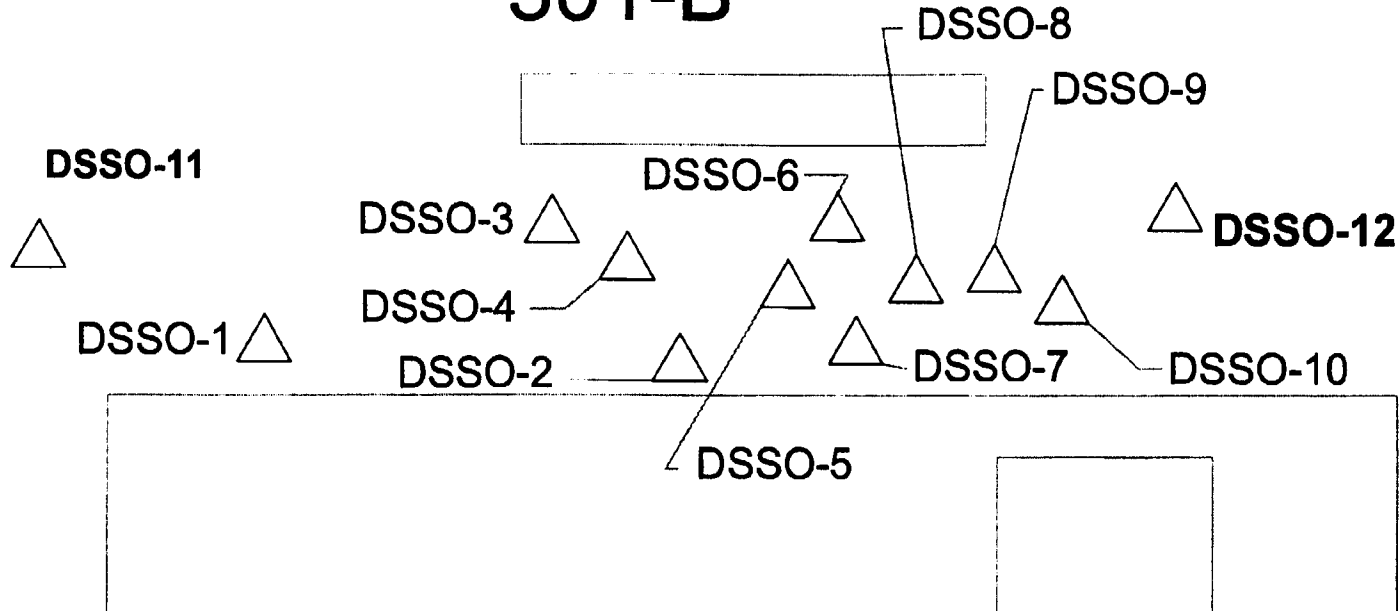


Table 5-6. Soil Sample Alpha Spectroscopy Data

Sample No.	U-234 Conc. (pCi/g)	U-235 Conc. (pCi/g)	U-238 Conc. (pCi/g)	Th-232 Conc. (pCi/g)	Th-230 Conc. (pCi/g)	Th-232 Conc. (pCi/g)
DSSO-1	0.49	0.006	0.53	0.38	0.96	0.48
DSSO-1D up	0.37	0.86	0.41	0.57	0.02	0.64
DSSO-2	0.69	0.008	0.71	0.66	1.22	0.69
DSSO-3	2.19	0.14	2.21	2.73	2.76	2.98
DSSO-4	2.08	0.16	2.23	2.86	3.02	2.95
DSSO-5	2.14	0.077	2.31	2.62	2.77	2.71
DSSO-6	2.26	0.104	2.31	2.90	2.97	2.70
DSSO-7	2.00	0.16	1.91	2.52	2.51	2.64
DSSO-8	1.30	0.072	1.39	1.85	2.56	1.95
DSSO-9	1.80	0.08	2.14	2.83	2.81	2.83
DSSO-10	2.04	0.096	1.91	2.10	2.71	1.99
Average	1.89	0.16	1.64	2.00	2.24	2.04
	Background					
DSSO-11	0.38	0.053	0.50	0.36	0.34	0.45
DSSO-12	1.36	0.029	1.45	1.33	1.89	1.27

Appendix 1
Site Activity Determination

Th content	U content	Th Activity	U Activity	Total curies
0.0080%	0.0750%	0.0001	0.0024	0.0025
0.0060%	0.0480%	0	0.0008	0.0008
0.0140%	0.0470%	0.001	0.0012	0.0022
0.0060%	0.0760%	0	0.0004	0.0004
0.1040%	0.0430%	0.0007	0.0009	0.0016
0.0080%	0.0500%	0	0.0003	0.0003
0.0310%	0.0870%	0	0.0004	0.0004
0.0120%	0.0740%	0.0001	0.0011	0.0012
0.0060%	0.0540%	0	0.0004	0.0004
0.0080%	0.0500%	0.0001	0.0013	0.0014
0.0060%	0.5000%	0	0.0004	0.0004
0.0080%	0.0460%	0	0.0008	0.0008
0.0100%	0.0580%	0.0002	0.004	0.0042
0.0640%	0.1380%	0.0002	0.0012	0.0014
0.0120%	0.0670%	0.0002	0.0035	0.0037
0.0050%	0.0880%	0	0.0026	0.0026
0.0100%	0.0570%	0.0002	0.004	0.0042
0.0080%	0.0600%	0	0.0007	0.0007
0.0500%	0.1070%	0.0005	0.0034	0.0039
0.0060%	0.0540%	0.0001	0.0038	0.0039
0.0140%	0.0600%	0.0003	0.0042	0.0045
0.0030%	0.0570%	0.0001	0.004	0.0041
0.0050%	0.0590%	0.0001	0.0041	0.0042
0.0580%	0.0830%	0.0013	0.0058	0.0071
0.0170%	0.0730%	0.0001	0.002	0.0021
0.0030%	0.0530%	0	0.0003	0.0003
0.0100%	0.0590%	0	0.0006	0.0006
0.0040%	0.0590%	0.0001	0.004	0.0041
0.0060%	0.0480%	0	0.0012	0.0012
0.0610%	0.0970%	0.0012	0.0062	0.0074
0.0240%	0.1080%	0	0.0003	0.0003
0.0040%	0.0520%	0	0.0005	0.0005
0.0030%	0.0520%	0	0.0005	0.0005
0.0030%	0.1320%	0	0.0015	0.0015
0.0120%	0.0470%	0.0001	0.0014	0.0015
0.0040%	0.0540%	0	0.0005	0.0005
0.0050%	0.1410%	0	0.0008	0.0008
0.0022%	0.2430%	0.0001	0.0042	0.0043
0.0190%	0.0830%	0.0001	0.0014	0.0015
0.0110%	0.0770%	0	0.0006	0.0006
0.0150%	0.0620%	0	0.0005	0.0005
0.0080%	0.0480%	0	0.0009	0.0009
0.0090%	0.0810%	0	0.0009	0.0009
0.0170%	0.0480%	0	0.0004	0.0004
0.0670%	0.1240%	0.0002	0.0014	0.0016
0.0050%	0.0850%	0	0.0012	0.0012

Appendix 1
Site Activity Determination

Th content	U content	Th Activity	U Activity	Total curies
0.0050%	0.0860%	0	0.0022	0.0022
0.0020%	0.0800%	0	0.0004	0.0004
0.0140%	0.0900%	0	0.0005	0.0005
0.0070%	0.0640%	0	0.0006	0.0006
0.0200%	0.0880%	0.0004	0.0061	0.0065
0.0120%	0.0530%	0	0.0003	0.0003
0.0330%	0.1340%	0.0002	0.0027	0.0029
0.0050%	0.0470%	0	0.0003	0.0003
0.0080%	0.0580%	0	0.0005	0.0005
0.0110%	0.0480%	0	0.0007	0.0007
0.0060%	0.0470%	0	0.0004	0.0004
0.0140%	0.0590%	0.0001	0.0015	0.0016
0.0780%	0.2820%	0.0009	0.0108	0.0117
0.0060%	0.0500%	0.0001	0.0026	0.0027
0.0800%	0.2840%	0.0001	0.0016	0.0017
0.0310%	0.1340%	0.0001	0.0008	0.0009
0.0178%	0.0882%	0.000145	0.001855	0.002
Activity from Tungsten				
Th content	U content	Th Activity	U Activity	Total curies
0.0300%	0.0700%	0.0005	0.0036	0.0041
0.0440%	0.0160%	0.006	0.0071	0.0131
0.0960%	0.2800%	0.0085	0.008	0.0165
0.0690%	0.0290%	0.006	0.0082	0.0142
0.0596%	0.0988%	0.00525	0.006725	0.011975

The total thorium activity in curies at the site is $0.000145 + 0.00525 = 0.00539516$ curies.
The total uranium activity in curies at the site is $0.001855 + 0.006725 = 0.00857984$ curies.
The total activity at the site is $0.00539516 + 0.00857984 = \mathbf{0.013975}$ curies

Calculate the percentage of each radionuclide. The percentage is determined by dividing the total activity of each radionuclide by the total activity at the site.

$$U_{Total} = \frac{0.00857984}{0.013975}(100) = 61.4\%$$

$$Th_{Total} = \frac{0.00539516}{0.013975}(100) = 38.6\%$$

Calculate the percentage of uranium isotopes in mix. For this calculation the uranium mix is assumed to contain 99.3% uranium 238 and 0.7% uranium 235.

$$U_{238} = 0.614 \times 0.997 = 0.61 \text{ or } 61\% \text{ of the total uranium is comprised of uranium 238}$$

$$U_{235} = 0.614 \times 0.007 = 0.004 \text{ or } 0.4\% \text{ of the total uranium is comprised of uranium 235}$$

Appendix 1
Site Activity Determination

Calculate the activity of each uranium isotope.

$$U_{238} = (0.61)(0.00857984) = 0.005Ci$$

$$U_{235} = (0.004)(0.00587984) = 0.0000559Ci$$