

# ORISE

OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

December 16, 1993

Mr. Raymond Glinski  
U.S. Nuclear Regulatory Commission  
Region III  
801 Warrenville Road  
Lisle, IL 60532-4351

2708-790-5646

SUBJECT: ANALYSIS OF SHEILDALLOY SOIL AND WATER SAMPLES  
(RFTA# 94-004)

DOCKET # 40-08948

Dear Mr. Glinski:

Enclosed are analytical results for samples from Shieldalloy in Cambridge, Ohio. Included are gamma spectroscopy data for soil and gross alpha/beta activities for water.

Several water samples have gross beta activities above background. Samples 2 and 6 were counted for 16 hrs on gamma spectroscopy to determine the cause of this beta activity. Sample 2 appears to contain potassium-40 ( $46 \pm 99$  pCi/L). This can be attributed to the high concentration of dissolved salts (3.2 grams per liter). Sample 2 also has high dissolved salts (7.9 grams per liter) and potassium-40 ( $250 \pm 90$  pCi/L) as well as cobalt-60 ( $38 \pm 8$  pCi/L) and cesium-137 ( $13 \pm 6$  pCi/L).

If you have any questions call me at (615) 576-5031 or Mark Laudeman at (615) 576-3561.

Sincerely,

William L. Beck  
Assistant Program Director  
Environmental Survey and  
Site Assessment Program

WLB:rde

Enclosure

cc: ~~T. Mo, NRC/NMSS, 4E4~~  
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**RADIONUCLIDE CONCENTRATION IN SOIL AND SLAG  
SAMPLES FROM SHIELDALLOY  
CAMBRIDGE, OHIO**

NRC No.	U-238 (pCi/g) <sup>a</sup>	U-235 (pCi/g) <sup>a</sup>	Th-232 (pCi/g) <sup>a</sup>	Ra-226 (pCi/g) <sup>a</sup>
93-891	8.7 ± 4.4	<0.5	5.9 ± 1.1	4.6 ± 0.9
93-891A	5.6 ± 3.1	<0.3	6.0 ± 0.9	8.1 ± 0.6
93-891B	3.4 ± 2.3	<0.3	4.8 ± 0.7	5.0 ± 0.6
93-900	4.4 ± 4.6	0.7 ± 0.5	4.1 ± 1.9	2.5 ± 1.0
93-900A	0.8 ± 0.3	<0.1	0.6 ± 0.3	<0.4
93-900B	6.7 ± 4.5	<0.4	3.8 ± 1.0	2.4 ± 0.6

**GROSS ALPHA AND BETA ACTIVITIES IN WATER**

Location or Sample I.D.	Activity (pCi/L) <sup>a</sup>	MDA (pCi/L)
<b>Gross Alpha</b>		
#1	-10 ± 7	14
#2	3 ± 13	24
#3	-27 ± 17	37
#4	-1.4 ± 3.9	7.3
Chapman Run	-5.4 ± 3.3	7.1
#6	-1 ± 5	10
Railroad Crossing-East Pile	3.0 ± 1.4	2.1
Cambridge Reservoir	-0.8 ± 2.2	4.1
Chapman Run	-3.8 ± 2.4	5.1
<b>Gross Beta</b>		
#1	81 ± 14	19
#2	270 ± 30	30
#3	220 ± 40	50
#4	52 ± 8	10
Chapman Run	22 ± 6	10
#6	100 ± 11	14
Railroad Crossing-East Pile	11 ± 2	3
Cambridge Reservoir	8.2 ± 3.8	6.1
Chapman Run	3 ± 9	16

<sup>a</sup>Uncertainties represent the 95% confidence level based only on counting statistics.