03-3040.30
December 13, 2007

Mr. David Horton, Project Manager
U.S. Army Joint Munitions Command
1 Rock Island Arsenal
Rock Island IL 61299-6000

RE: Backfill Authorization Request for Survey Unit No. 5

Dear Mr. Horton;

Cabrera Services, Inc. (CABRERA) requests authorization to backfill the open excavation in survey unit (SU) 4 within the DRMO area at the Naval Station Great Lakes. Results of the surveys and sampling performed within SU 5 have been shown to meet the criteria outlined in the *Public Private Venture Area Remediation, Addendum to Work Plan for the Remediation of the Recreation and Center Tank Areas and Site-Wide Final Status Survey (hereafter referred to as the Work Plan Addendum [WPA]),* dated May 2007. (CABRERA 2007a) as well as the recently developed derived concentration guideline level (DCGL) of 4 picocuries per gram (pCi/g) above background for thorium-232 (^{232}Th).

Summary of Results

The survey and sampling approach provided in the WPA was designed in accordance with the *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)* for Class 1 final status surveys (FSS). Systematic soil samples on a specified grid, performance of a 100% gamma walkover survey (GWS), and collection of biased soil samples, as required, were all performed. Areas that were identified as suspected or confirmed as elevated in previous investigations at the site were test pitted, and surveyed. Excavation was directed using a 2x2 NaI detector. Those areas that exhibited readings of approximately 2x background were remediated. Following remediation the areas were re-surveyed and biased samples were collected to confirm successful remediation. None of the excavations in SU-5 contained systematic sample locations; as such the systematic data is provided to give an overall understanding of the survey unit and are not directly used to determine that the excavation is candidate for backfill.

A summary of all SU 5 soil sample results is attached, with summary statistics for the systematic and biased samples provided in Table 1 and Table 2, respectively. All soil sample results were shown to be below the $DCGL_W$ of 4 pCi/g for ^{232}Th. Biased samples (Table 2) taken within the excavation did not identify ^{232}Th activity above $DCGL_W$. Therefore, no $DCGL_{EMC}$ concerns were identified.

Table 1. Systematic Sample Summary Statistics for SU 5.
(All values in pCi/g)

Survey Unit	Mean	Median	Max	Standard Deviation
SU-5	0.8	0.79	1.26	0.29

Table 2. Results of SU 5 Biased Samples

Sample ID	^{232}Th (pCi/g)	2-σ Uncertainty (pCi/g)	Comments
SU5-B51	1.01	0.15	Concentration below DCGL.
SU5-B52	0.98	0.13	Concentration below DCGL.
SU5-B54	2.39	0.21	Concentration below DCGL.

Summary and Conclusion

The results of the data for SU 5 presented above have all been shown to be below the $DCGL_W$ of 4 pCi/g for ^{232}Th. As such, CABRERA requests authorization to backfill the open excavation to grade in SU 5.

This data serves as a partial FSS package and will be incorporated into the complete FSS data package for SU 5, which will be assembled after all excavation activities are complete.

Should you have questions or comments, please contact me at 314.703.6784

Sincerely,

//SIGNED//

John Eberlin, PMP
Project Manager
Cabrera Services, Inc.

Attachment
cc: Project File

ATTACHMENTS

Gamma Walkover Survey Results Maps for SU 5 Excavation

Onsite Gamma Spec Lab Data Summary

SU 5 Onsite Gamma Spec Lab Data Summary (all Results in pCi/g)

Filename	Sample Size	Units	Date Started	Time Started	^{228}Ac-(^{232}Th)	2σ Uncert	MDA
Class 1 FSS Samples							
SU5-101-1	1098	grams	8/1/2007	20:19	0.57	0.15	0.24
SU5-101-2	1359	grams	8/1/2007	20:37	0.85	0.15	0.24
SU5-102-1	1520	grams	7/31/2007	20:33	0.68	0.14	0.20
SU5-102-3	1303	grams	7/31/2007	20:50	1.11	0.17	0.30
SU5-103-1	1277	grams	8/3/2007	15:18	1.10	0.18	0.33
SU5-103-2	1451	grams	8/3/2007	15:38	0.92	0.15	0.24
SU5-104-1	1273	grams	8/3/2007	15:56	1.18	0.17	0.27
SU5-104-2	1327	grams	8/3/2007	16:14	1.07	0.16	0.25
SU5-105-1	1161	grams	8/3/2007	22:12	0.58	0.16	0.26
SU5-105-3	1371	grams	8/3/2007	22:30	0.93	0.16	0.30
SU5-84-1	1539	grams	8/3/2007	17:09	0.78	0.12	0.22
SU5-84-4	1595	grams	8/3/2007	17:29	0.67	0.12	0.20
SU5-85-1	869	grams	8/3/2007	12:49	0.75	0.18	0.23
SU5-85-3	1019	grams	8/3/2007	13:11	1.21	0.00	0.35
SU5-86-1	885	grams	8/3/2007	20:55	0.66	0.21	0.25
SU5-86-3	1403	grams	8/3/2007	21:12	0.55	0.13	0.24
SU5-87-1	1207	grams	8/1/2007	22:46	0.84	0.15	0.23
SU5-87-4	1289	grams	8/1/2007	23:03	1.08	0.16	0.26
SU5-88-1	1263	grams	8/3/2007	10:31	1.15	0.16	0.29
SU5-88-2	1387	grams	8/3/2007	10:47	0.79	0.15	0.30
SU5-89-1	1221	grams	8/4/2007	9:38	0.55	0.12	0.23
SU5-89-2	1230	grams	8/4/2007	9:55	0.68	0.14	0.26
SU5-90-1	968	grams	8/3/2007	21:32	0.58	0.16	0.31
SU5-90-2	1167	grams	8/3/2007	21:49	0.76	0.18	0.29
SU5-91-1	1384	grams	8/7/2007	9:53	0.73	0.14	0.24
SU5-91-3	1430	grams	8/7/2007	10:09	0.65	0.13	0.25
SU5-92-1	1506	grams	7/31/2007	19:55	0.21	0.08	0.16
SU5-92-4	1539	grams	7/31/2007	20:12	0.64	0.12	0.21
SU5-100-1	1170	grams	8/2/2007	10:13	1.26	0.18	0.29
SU5-93-1	1001	grams	8/7/2007	14:24	1.13	0.19	0.35
SU5-93-2	1275	grams	8/7/2007	14:42	1.02	0.17	0.28
SU5-93-3	1527	grams	8/2/2007	10:30	0.94	0.13	0.26
SU5-94-1	1136	grams	7/31/2007	19:13	0.90	0.16	0.29
SU5-94-2	1775	grams	7/31/2007	19:31	0.72	0.12	0.20
SU5-95-1	1128	grams	7/31/2007	21:08	0.95	0.17	0.30
SU5-95-4	1468	grams	7/31/2007	21:25	1.02	0.15	0.23
SU5-96-1	1066	grams	8/3/2007	18:25	0.98	0.18	0.36
SU5-96-2	1455	grams	8/3/2007	18:42	0.81	0.15	0.25
SU5-97-1	949	grams	8/3/2007	22:52	<MDA	N/A	0.51
SU5-97-4	1226	grams	8/3/2007	23:12	0.65	0.15	0.29
SU5-98-1	1056	grams	8/3/2007	14:04	0.00	N/A	0.46
SU5-98-3	1116	grams	8/3/2007	14:23	0.76	0.15	0.27

Filename	Sample Size	Units	Date Started	Time Started	^{228}Ac-(^{232}Th)	2σ Uncert	MDA
Biased Samples							
SU5-B51	1545	grams	12/4/2007	10:40	1.01	0.15	0.21
SU5-B52	1751	grams	12/3/2007	14:41	0.98	0.13	0.23
SU5-B54	1655	grams	12/4/2007	8:36	2.39	0.21	0.37

Notes:
1. SU# = Survey Unit
2. PR = post-remediation
3. FD = field duplicate
4. B = bias

MDA = Minimum Detectable Activity