

January 28, 2005

Mr. Steve Doremus
Department of the Navy
NAVSEADDET RASO
NWS P.O. Drawer 260
Yorktown, VA 23691-0260

SUBJECT: NRC INSPECTION REPORT 040-08306/2004-002(DNMS)
FORMER ENGELHARD MINERALS & CHEMICAL CORPORATION

Dear Mr. Doremus:

On January 4, 2005, the NRC completed an inspection at the Naval Station Great Lakes, Former Monazite Sand Storage Area, North Fence Area, Great Lakes, Illinois. The purpose of the inspection was to determine whether decommissioning activities were conducted in accordance with your final status survey plan and NRC requirements, and to perform independent confirmatory measurements. Specifically, during an onsite inspection on November 30, 2004, the NRC inspector evaluated the results of your contractor's final status survey of the North Fence Area, performed independent confirmatory surveys, and collected soil samples from remediated areas. At the conclusion of the onsite inspection, the NRC inspector discussed the preliminary findings with Mr. Mark Schultz, Regional Environmental Program Director. On January 4, 2005, the inspector completed an in-office review of the laboratory data results for the soil samples that were collected during the inspection and conducted a telephone exit interview with Ms. Pat Hayworth, Environmental Protection Manager.

This inspection consisted of an examination of decommissioning activities at the Naval Station's North Fence Area as they relate to safety and compliance with the Commission's rules and regulations. Areas examined during the inspection are identified in the enclosed report. Within these areas, the inspection consisted of a selective examination of representative records, interviews with personnel, and independent confirmatory measurements.

Based on the results of this inspection, the NRC did not identify any violations of NRC regulatory requirements.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). The NRC's document system is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Please note that on October 25, 2004, the NRC terminated public access to ADAMS and initiated an additional security review of publicly available documents to ensure that potentially sensitive information is removed from the ADAMS database accessible through the NRC's web

S. Doremus

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site. Interested members of the public may obtain copies of the referenced documents for review and/or copying by contacting the Public Document Room pending resumption of public access to ADAMS. The NRC Public Documents Room is located at NRC Headquarters in Rockville, MD, and can be contacted at (800) 397-4209.

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

/RA/

Jamnes L. Cameron, Chief
Decommissioning Branch
Division of Nuclear Materials Safety

License No. SMC-01207 (Terminated)
Docket No. 040-08306 (Terminated)

Enclosure: Inspection Report 040-08306/2004-002(DNMS)

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No.: 040-08306 (terminated)

License No.: SMC-01207 (terminated)

Report No.: 040-08306/2004-002(DNMS)

Former Licensee: Engelhard Minerals & Chemicals Corporation

Site Owner: Department of the Navy

Facility: Former Monazite Sand Storage Area, North Fence Area

Location: Naval Station Great Lakes, Great Lakes, Illinois

Dates: November 30, 2004 (on-site inspection)
January 4, 2005 (in-office review)

Inspector: Gene Bonano, Decommissioning Inspector

Approved By: Jamnes L. Cameron, Chief
Decommissioning Branch
Division of Nuclear Materials Safety

EXECUTIVE SUMMARY

Engelhard Minerals & Chemicals Corporation Naval Station Great Lakes, Great Lakes, IL Inspection Report No. 040-08306/2004-002(DNMS)

The Engelhard Minerals & Chemicals Corporation (Engelhard), which is no longer in business, was licensed to repackage and ship monazite sand, which contained thorium-232 from the Naval Station Great Lakes to other Atomic Energy Commission and Nuclear Regulatory Commission licensees. The Engelhard license was terminated in 1975. The U.S. Navy is the site owner and assumed responsibility for the site cleanup of residual contamination from the monazite sand. The NRC reviewed and approved the Navy's final status survey plan, "Work Plan for the Characterization of the Recreation and Center Tank Areas and Radiological Remediation and Final Status Survey of the North Fence Area." The decommissioning activities were performed for the Navy through the U.S. Army Field Support Command by a contractor.

This routine decommissioning inspection was performed to evaluate the radiological final status surveys performed by the Navy's decommissioning contractor. The NRC inspector also performed a confirmatory and closeout survey of the North Fence Area.

Close-out Inspection and Survey

- The inspector concluded, based on inspection observations, evaluations, and independent surveys, that the Navy conducted the final status survey of the North Fence Area in accordance with its final status survey plan.

Report Details

1.0 Closeout Inspection and Survey (83890)

a. Inspection Scope

The inspector evaluated the results of the contractor's final status surveys (FSS) of the North Fence Area to verify that work was done in accordance with the final status survey plan. The inspector interviewed contractor personnel, performed independent radiological surveys, and collected soil samples from the remediated areas.

b. Observations and Findings

The contractor used guidance contained in NUREG-1575, "Multi-Agency Radiation Survey and Site Investigation Manual" to write the FSS plan and conduct the final status surveys in the North Fence Area. The contractor's work activities included establishing a survey measurement reference grid system, conducting surface measurements using hand-held radiation instruments, recording the radiological measurements, collecting soil samples for analysis, and documenting a chain of custody for samples. The inspector noted that the contractor's staff also established radiological postings and controls commensurate with expected conditions and procedural requirements prior to conducting the surveys and collecting samples.

The inspector determined that the contractor had performed walkover surveys and collected soil samples in accordance with the FSS plan. The inspector determined that reference background data for the North Fence Area was established from previous work done at the site in calendar year 2003, and that the average background concentration of 0.86 picocuries of thorium-232 per gram (pCi/g) continued to be relevant. The established Derived Concentration Guideline Level is 1.0 pCi/g in surface soil for this site.

The inspector evaluated the contractor's surface scans and direct surface activity measurement results, and radiological analytical results of the soil samples counted in the contractor's on-site laboratory. The contractor implemented a quality assurance program, which consisted of sending 10 percent of the soil samples (duplicates) to an independent third party laboratory for analysis.

The inspector performed independent radiological surveys (surface scans) in the North Fence Area using a calibrated radiation survey meter with a sodium iodide detector. The inspector noted radiation levels between 7,000 and 10,000 counts per minute (cpm), and one location above 15,000 cpm (sample NRC-2). The inspector noted that these readings were slightly elevated from a natural background radiation level of about 5,000 to 6,000 cpm. The inspector collected three biased soil samples from the North Fence Area (samples NRC-1 through -3), one background soil sample from an unaffected location about 200 yards off-site (sample NRC-4), and three of the contractor's samples as duplicates for radiological analysis (samples NRC-5 through -7).

The NRC's contract laboratory, the Oak Ridge Institute for Science and Education (ORISE), performed the radiological analysis of the soil samples for the NRC. The analytical results of the soil samples collected by the NRC and the Navy's contractor are listed below:

| NRC | | Navy | |
|------------|---------------------|----------------|---------------------|
| Sample No. | Thorium-232 (pCi/g) | Sample No. | Thorium-232 (pCi/g) |
| NRC-1 | 0.94 ± 0.18 | n/a | n/a |
| NRC-2 | 4.30 ± 0.40 | n/a | n/a |
| NRC-3 | 0.92± 0.18 | n/a | n/a |
| NRC-4 | 0.84 ± 0.15 | n/a | n/a |
| NRC-5 | 1.23 ± 0.16 | F-N1-1006-S-01 | 0.95 ± 0.19 |
| NRC-6 | 0.21 ± 0.07 | F-N1-1004-S-01 | 0.38 ± NR* |
| NRC-7 | 0.99 ± 0.16 | F-N2-1034-S-01 | 0.77 ± 0.16 |

*NR = not reported

Navy personnel informed the inspector of their intent to re-evaluate and remediate, in the Spring of 2005, the location where the NRC-2 sample was collected.

c. Conclusions

The inspector concluded, based on inspection observations, evaluations and independent surveys, that the Navy conducted the final status survey of the North Fence Area in accordance with its final status survey plan.

2.0 Exit Meeting

The inspector presented preliminary inspection results to Mr. Shultz at the conclusion of the onsite inspection on November 30, 2004. A final exit meeting was conducted by telephone on January 4, 2005, with Ms. Hayworth to discuss NRC's in-office review of the analytical results of the soil sample analyses. The Navy's representatives acknowledged the findings presented. The inspector asked the Navy's representatives whether any materials that could be included in the inspection report should be considered proprietary. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

P. Hayworth, Environmental Protection Manager, NAVSEADDET, RASO
M. Shultz, Regional Environmental Program Director, Navy Region Midwest
D. Horton, Health Physicist, U.S. Army Field Support Command

INSPECTION PROCEDURES USED

IP 83890 Closeout Inspection and Survey
IP 87104 Decommissioning Inspection Procedure for Materials Licensee

ITEMS OPENED, CLOSED, AND DISCUSSED

| | |
|-----------|------|
| Opened | None |
| Closed | None |
| Discussed | None |

LIST OF ACRONYMS USED

| | |
|-------|---|
| ADAMS | Agencywide Documents Access and Management System |
| CFR | Code of Federal Regulations |
| cpm | counts per minute |
| DNMS | Division of Nuclear Materials Safety |
| FSS | Final Status Survey |
| NRC | Nuclear Regulatory Commission |
| ORISE | Oak Ridge Institute for Science and Education |
| PARS | Publicly Available Records |
| pCi/g | picrocuries per gram |