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DECONTAMINATION OF URANYL NITRATE HEXAHYDRATE TANKS

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LETTER/REPOR

7083

Department of Energy
Fernald Environmental Management Project
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JUL 3 1 1995
DOE-1293-95

Mr. James A. Saric, Remedial Project Director
U.S. Environmental Protection Agency
Region V - 5HRE-8J
77 W. Jackson Blvd.
Chicago, IL 60604-3590

Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, OH 45402-2911

Dear Mr. Saric and Mr. Schneider:

DECONTAMINATION OF URANYL NITRATE HEXAHYDRATE TANKS

Reference: 1. Letter, T. E. Crepeau to J. Craig and D. Ofte, "Director's Final Findings and Orders", dated December 27, 1994

2. Letter, T. A. Schneider to J. Craig, "DOE FEMP MSL #531-0297 Hamilton County UNH Orders", dated June 15, 1995

This letter provides information and data, for your review, concerning the decontamination of Uranyl Nitrate Hexahydrate (UNH) tanks F2E-6 and D1-10. The purpose of this letter is to request your concurrence that the information provided adequately demonstrates compliance with Paragraph V.5 of the referenced Director's Findings and Orders (DF&O), as clarified by reference 2, for the two tanks.

Tank F2E-6 (NE CD Blend) is a 25,232 gallon capacity, elevated, flat bottom tank. Tank D1-10 is a 3,625 gallon capacity, elevated, rounded bottom, tank with a 3 inch bottom drain and 20 inch manhole. Resource Conservation and Recovery Act (RCRA) metals, total uranium, and pH data for the UNH solutions contained in the tanks prior to neutralization and rinsing are listed in Attachment 1.

After the UNH was removed from the tank, the tank was rinsed using a two-phase process. This process is described in Attachment 2. It is anticipated that a similar process will be employed to decontaminate the remaining UNH tanks.

Analysis of the final rinseate from the tanks is provided in Attachment 3.

Upon receipt of your concurrence that the above information is acceptable, we will proceed to compile the same information for the remaining tanks for the report to be submitted pursuant to paragraph V.5 of the DF&O.

If you have any questions or require further information, please contact Chris White at (513) 648-3172.

Sincerely,

Susan M Peterman for J R Craig

FN:White

Jack R. Craig
Fernald Remedial Action
Project Manager

Enclosure: As Stated

cc w/o enc:

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ATTACHMENT 1

Tank	UNH Volume (gal.)	pH	lead mg/l	barium mg/l	chromium mg/l	mercury mg/l	total uranium mg/l
F2E-6	22,851	<1	3.48	11.6	2.6	<0.01	201
D1-10	2,848	<1	24.07	99.3	1003	5.52	154

ATTACHMENT 2

UNH TANK DECONTAMINATION PROCEDURE

Phase I - Removal of solids from the tank

After all the UNH solution is removed from the tank, an inspection of the tank is made to determine if solids are present. If no solids are found, cleaning moves to Phase II. If solids are found to exist in the tank, an attempt is made to remove the solids from the bottom of the tank with process water utilizing a spray nozzle. The operator sprays water into the tank through the top manway. After approximately 1 inch of water has accumulated in the tank, Transfer Pump (J101 or J105) is turned on and left running at 5 gpm while the spraying is continued. For tanks such as F2E-6 where there is a large distance between the manway and the far side of the tank, or other cases where use of the spray nozzle is not effective in removing all of the solids, a fire hose is used to complete solids removal. The fire hose is employed to spray water to the back of the tank while the transfer pump transfers the rinse water to either Neutralization tank F1-25 or F1-26. This is repeated as necessary until solids have been removed to the extent practical.

Phase II- Rinsing of the tank to meet RCRA closure requirement.

After spraying down the sides of the tank using either the spray nozzle (for the smaller tanks), or the fire hose (for the larger tanks) the rinseate is transferred to one of two UNH neutralization tanks (F1-25 and F1-26). The full inside surface of the tank is then rinsed again and the rinseate is transferred to one of the neutralization tanks. After this second rinse and transfer, a sample of the rinse water is taken from the discharge side of the transfer pump. The pH of this rinseate is checked with a portable pH analyzer. If the rinse pH is below 2.0, the tank is rinsed again, and resampled. When a rinse sample indicates a pH above 2.0 on the field pH analyzer, the tank is rinsed one more time, and the rinseate transferred for neutralization. A sample is taken, again from the discharge side of the transfer pump, and sent to the FEMP laboratory for pH and heavy metal analysis. If the results of the laboratory analysis shows a pH above 2 and the heavy metal levels to be below specified rinseate levels, the rinsing is deemed complete.

It should be noted that after this final rinse, a very thin layer of magnesium fluoride residue was observed to remain at the bottom of tank F2E-6. During Plant 2/3 operations, unreacted magnesium fluoride was typically observed at the bottom of refinery tanks when they were emptied. At that time, this material was removed manually and drummed. As this residue is inert and non hazardous, and can cause plugging at the EIMCO filters, the generation and subsequent processing of additional rinseate required to remove it is not justified.

ATTACHMENT 3

Tank	pH	lead[1] mg/l	barium[1] mg/l	chromium[1] mg/l	mercury[1] ppb	total uranium
F2E-6	6.89	<0.0225	<0.2	0.0709	<0.2	32.3 mg/l
D1-10	5.54	<0.225	<0.2	0.272	<0.2	50.8 mg/l
Rinseate standards[2]	<12.5 > 2.0	0.6	1.0	1.0	30.0	NA

[1] Preliminary Data.
[2] The rinseate decontamination standards described in the Closure Guidance section 3.10 were used to develop the following rinseate clean standards listed.