



Department of Energy

Washington, DC 20585

SEP 13 1994

Mr. Joseph J. Holonich, Chief
High-Level Waste and Uranium
Recovery Project Branch
Division of Waste Management
Office of Nuclear Material
Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Holonich:

At the July 26, 1994, Bi-monthly Management meeting, the U.S. Department of Energy committed to provide the U.S. Nuclear Regulatory Commission with a copy of the U.S. Environmental Protection Agency letter, dated November 22, 1993, that deals with the applicability of the Resource Conservation and Recovery Act to Naval reactor fuel. A copy of this letter is enclosed. If you have any questions, please contact Chris Einberg of my staff at (202) 586-8869.

Sincerely,

Christopher A. Kouts
Christopher A. Kouts, Acting Director
Regulatory Integration Division
Office of Civilian Radioactive
Waste Management

Enclosure

cc: w/enclosure
R. Nelson, YMPO
R. Loux, State of Nevada
W. Offutt, Nye County, NV
T. J. Hickey, Nevada Legislative Committee
D. Bechtel, Las Vegas, NV
Eureka County, NV
Lander County, Battle Mountain, NV
P. Niedzielski-Eichner, Nye County, NV
L. Bradshaw, Nye County, NV
C. Schank, Churchill County, NV
F. Mariani, White Pine County, NV
V. Poe, Mineral County, NV
J. Pitts, Lincoln County, NV
J. Hayes, Esmeralda County, NV
B. Mettam, Inyo County, CA
M. Knapp, NRC
W. Barnard, NWTRB
M. Steindler, ACNW

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

NOV 22 1993

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

Mr. Richard A. Guida
Associate Director for Regulatory Affairs
Office of Naval Reactors
Department of Energy
Washington, DC 20585

Dear Mr. Guida:

Thank you for the opportunity to review the reports which you recently submitted to me regarding the Naval Nuclear Propulsion Program's (NNPP) spent nuclear reactor fuels and the RCRA hazardous waste determination. In these reports, the NNPP detailed its efforts at characterizing the Program's spent fuels based both on "process knowledge" and actual analyses conducted in hot cells in accordance with the Toxicity Characteristic Leachate Procedure (TCLP).

First, I want to commend your staff for the extraordinary efforts undertaken to characterize actual samples of irradiated fuel for the Toxicity Characteristic. I recognize that it is a fairly daunting task to sample and analyze these highly radioactive materials, and I believe your Program's efforts are unprecedented in this respect. I also would like to thank Mark Neblett of your staff for his efforts to clarify for my staff portions of the draft report that accompanied your September 20, 1993 letter to EPA, and to hand deliver additional materials to assist the Office of Solid Waste (OSW) in its review.

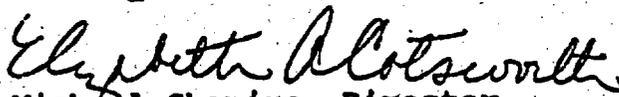
The entire report was reviewed by both EPA mixed waste policy staff in the Permits and State Programs Division, and RCRA testing methods experts in our Characterization and Assessment Division. Based on my staff's review, the Office of Solid Waste concurs with the reports' conclusion that the NNPP's spent reactor fuels and assemblies should not present any of the characteristics that identify RCRA hazardous wastes. Our concurrence is based on our review and agreement with the NNPP's "process knowledge" analysis, the TCLP analytical procedures used, and the TCLP/quality control measures described in your report. We also believe, given the conservative assumptions which the NNPP employed in selecting representative spent fuel samples (i.e., selecting samples that contained the highest possible concentrations of RCRA hazardous metals), that the reports support a general determination that none of the Program's spent reactor fuels would be classified as RCRA

hazardous wastes. This latter conclusion is, of course, conditioned on the completeness and accuracy of the information shared with EPA on the Program's "process knowledge," particularly with regard to projecting the TCLP test results obtained to other fuels than those that were actually involved in the testing.

As you are aware, EPA delegates the authority to implement the Subtitle C RCRA program to the States. Currently, 35 States and one territory have received from EPA the approval to regulate RCRA mixed waste. We recommend that you share your results with the appropriate hazardous waste personnel in those States where the spent reactor fuel is managed.

Again, we appreciate the opportunity to evaluate the results of the spent fuel "process knowledge" analysis and TCLP test. If you have any questions on EPA's review, please contact Susan Jones, at (703) 308-8762.

Sincerely,

for 
Elizabeth Altsworth
Michael Shapiro, Director
Office of Solid Waste

SUMMARY OF NAVAL FUEL RCRA HAZARD "PROCESS KNOWLEDGE" ANALYSIS

1. Does spent naval fuel contain any "listed" hazardous wastes?

a. 40 C.F.R. § 261.31 Non-specific sources (F-wastes):

Solvents (F001 - F005) None
Wastewater-Electroplating Sludges
(F006 & F019) None
Cyanide bath wastes (F007 - F012) None
Organic related wastes (F020 - F038) None
Leachate from listed wastes (F039) None

b. 40 C.F.R. § 261.32 Specific sources (K-wastes):

Sludges/bottoms/ends/tars/filters, organic &
inorganic, explosives, petroleum refining, iron &
steel (manufacture), primary copper/lead/zinc/
aluminum production, veterinary pharmaceuticals,
ink production, and coking None

c. 40 C.F.R. § 261.33 Discarded commercial chemical
products (commercially pure grade chemicals),
off-specification species, & their residues None

2. Does spent naval fuel exhibit any of the "characteristics"
of a hazardous waste?

a. 40 C.F.R. § 261.21 Ignitability:

Spent naval fuel is not "capable under standard
temperature and pressure of causing fire through
friction, adsorption of moisture or spontaneous
chemical changes."

b. 40 C.F.R. § 261.22 Corrosivity:

Not applicable - spent naval fuel is not a liquid with
pH less than 2 or greater than 12.5.

c. 40 C.F.R. § 261.23 Reactivity:

Spent naval fuel is not unstable, potentially
explosive, capable of detonation, does not generate
toxic gases, and does not react violently with water.

d. 40 C.F.R. § 261.24 Toxicity Characteristic:

Spent naval fuel does not contain any of the organic
materials listed in Table 1 of § 261.24. Accordingly,
only the metals listed in Table 1 need be evaluated.
The Toxicity Characteristic Leachate Procedure (TCLP)
test limits for these metals are:

<u>Metal</u>	<u>TCLP Concentration Limit</u>
Arsenic	5.0 mg/liter (ppm)
Barium	100.0 mg/l
Cadmium	1.0 mg/l
Chromium	5.0 mg/l
Lead	5.0 mg/l
Mercury	0.2 mg/l
Selenium	1.0 mg/l
Silver	5.0 mg/l

Assumptions Used in the "Process Knowledge" Analysis:

Based on a 100 gram sample, all constituents are assumed to be exposed to the leaching fluid (2000 grams of leaching fluid \approx 2 liters) - no credit is taken for unexposed surfaces within the sample particles.

The representative sample includes only the fuel-bearing region of a naval reactor core, which is where the maximum concentrations of the above metals, with the exception of chromium, are found. The maximum concentration of chromium is found in the Zircaloy-4 core structural material (small amounts of chromium are added to the zirconium as an alloying element), therefore the representative sample used for the chromium extraction calculation is Zircaloy-4 structural material.

Fission products with decay chains that end with a TCLP metal are assumed to be fully decayed to their stable state (thereby maximizing their concentrations) and are present in the proportions observed with the parent radionuclides from Uranium-235 fission.

All of the TCLP metals present in the sample are assumed to be released to the leaching solution during the test period. No credit is taken for the highly corrosion-resistant nature of naval fuel, except in the chromium analysis (see note below).

Calculated Theoretical Maximum Concentrations:

<u>Metal</u>	<u>Leachate Concentration</u>	<u>TCLP Limit</u>
Arsenic	1.25 mg/l	5.0 mg/l
Barium	30.0	100.0 mg/l
Cadmium	0.22	1.0 mg/l
Chromium	---	5.0 mg/l
Lead	3.4	5.0 mg/l
Mercury	0.0	0.2 mg/l
Selenium	1.1**	1.0 mg/l
Silver	0.93	5.0 mg/l

* Due to the presence of chromium as an alloying agent in Zircaloy-4, the TCLP test's 20 to 1 dilution into the leachate solution results in a calculated chromium concentration on the order of 50 mg/l. The extremely high corrosion resistance of Zircaloy-4 would not permit such a high concentration to actually occur. The calculated leachate concentration, even using a corrosion rate significantly higher than any ever actually observed, is on the order of 0.001 mg/l.

** This value does not consider corrosion resistance, surface area exposure, etc. Actual TCLP results would be far below the TCLP limit.