

Mr. Charles A. Judd
 Executive Vice President
 Envirocare of Utah, Inc.
 American Towers Commercial
 46 W. Broadway, Suite 240
 Salt Lake City, Utah 84101

MAY 19 1994

Dear Mr. Judd:

On March 8, 1994, Envirocare of Utah, Inc., (Envirocare) submitted, for U.S. Nuclear Regulatory Commission review and approval, the following document in response to License Condition 9.7(a) of byproduct material license No. SMC-1559:

"Liner Compatibility Report" dated March 8, 1994.

As a result of our review, the staff has identified questions regarding the stability of the liner in the presence of an acid leachate. In order for the staff to proceed with the review, the licensee must provide a complete response to each question provided in the enclosure to this letter.

In order to support our review schedule, please provide your response to the enclosed comments within 60 days of the date of this letter. If you are unable to meet that date, please provide your schedule for responding within 10 days of the date of this letter. Should you have any questions regarding the enclosure, please contact the NRC Project Manager, Sandra L. Wastler at (301) 415-6724.

Sincerely,

/s/

Joseph J. Holonich, Chief
 High Level Waste and Uranium
 Recovery Projects Branch
 Division of Waste Management
 Office of Nuclear Material Safety
 and Safeguards

Enclosure: As stated

cc: D. Hiller
 W. Sinclair, Utah

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Docket Number: 40-8989

License Number: SMC-1559 Casework No: L50919

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SUBJECT ABSTRACT: COMMENTS ON ENVIROCARE'S MARCH 8, 1994 SUBMITTAL

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U.S. NUCLEAR REGULATORY COMMISSION

REQUEST FOR ADDITIONAL INFORMATION
ON THE

LINER COMPATIBILITY REPORT

BY

ENVIROCARE OF UTAH, INC.

DATED MAY 8, 1994

1. Section 3.1.2 of the report discusses the concentration of constituents in the synthetic leachate used in the testing. In particular, the leachate contained an initial concentration of barium (Ba) at 8,000 milligrams/liter (mg/l), fluoride (F) at 25 mg/l and sulfate (SO₄) at 3,000 mg/l. At these concentrations, the solution is supersaturated with respect to barite and fluorite and the possibility exists they could precipitate from solution. The result of this precipitation could be a reduction in porosity or permeability, and the false impression that the liner is a good sorber of contaminants. Therefore, the licensee needs to provide an explanation of why the synthetic leachate was prepared with concentrations of constituents that exceeded solubility limits and discuss whether the possibility of precipitation could have affected the results of the liner compatibility tests.
2. In section 2.0 of the report, the testing showed that 3 liters of synthetic leachate in contact with the clay liner resulted in the dissolution of approximately 2% of the liner. The evidence for this is the difference between the final and initial concentrations of sodium (Na) and chloride (Cl) (e.g., in sample pH 4W, 11,300 mg/l to 1,000 mg/l for Na and 13,300 mg/l to 200 mg/l for Cl). When groundwater, which is saline, was used as the leachate only 0.2% of the liner was dissolved. The report, however, did not address whether the addition of more leachate to the liner during the test would continue to dissolve liner material. The licensee needs to provide this additional information.
3. Attachment 2 of the report provides the laboratory test results of the leachate effluent. The concentrations of sodium (Na) and chloride (Cl) in this effluent are significantly higher than in the original synthetic leachate. However, the material that contributed to the high Na and Cl concentrations of the final solution most likely did not come from the minerals identified by X-ray diffraction. Therefore, the licensee needs to discuss how much unidentified leachable material is present in the liner material or provide additional information on the source of the additional Na and Cl.
4. The report discusses the geochemical impact of the leachate on liner stability, but the licensee has not discussed the impact of physical changes in the liner. For example, one possibility

is that the liner might effervesce when contacted with an acid leachate. The evolution of gas bubbles could disrupt the porosity of the liner, creating preferential pathways for fluid flow. The licensee needs to provide additional information on this type of impact.