UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

JUN 17 1980

FCJP:WAN
40-8027
SUB-1010, Amendment No. 11

Kerr-McGee Nuclear Corporation
ATTN: Mr. W. J. Shelley, Director
Regulation and Control
Kerr-McGee Center
Oklahoma City, Oklahoma 73102

Gentlemen:

Pursuant to Title 10, Code of Federal Regulations, Part 40, Source Material License No. SUB-1010 is hereby amended to authorize the following activities:

1. The use, on a permanent basis, of barium treated neutralized solvent extraction raffinate for fertilizer on Kerr-McGee owned land in accordance with the statements contained in your January 29, 1980, application, as supplemented by your letter dated April 3, 1980, and subject to the following requirements:

   a. The barium treated neutralized solvent extraction raffinate to be used as fertilizer shall have a pH no lower than 7.5 and a Ra-226 content not exceeding 2 pCi/l of solution.

   b. Fertilizer usage shall be less than 700 pounds of total nitrogen per year per acre fertilized.

   c. No fertilizer shall be applied closer than 100 feet to any occupied residence, business or school.

   d. In addition to sampling and analysis requirements contained in the application, monthly water samples shall be collected from wells FTP 1A, 2A, 3A, 4A, 5, 6, 7, and GW 1, 2 and 3 during the treated raffinate application period and analyzed individually for uranium, Ra-226 and nitrate. Kerr-McGee shall take prompt corrective action if any sample shows elevated values for uranium, Ra-226 or nitrate content.

e. Operation of the raffinate neutralization and barium system shall be evaluated so that limits, expressed as pCi/gm total N or mg/g total N, can be established in the future for Ra-226, Th-230 and U in treated raffinate. Results of the evaluation and proposed limits shall be included in the completion report (see Item f below) to be submitted by May 1, 1981.

f. A completion report describing the previous calendar year fertilizer program and the results obtained shall be submitted to NRC by May 1 of each year.

All other conditions of this license shall remain the same.

Please note that this license amendment does not authorize either disposal off-site of any material grown on the areas fertilized with treated raffinate or the grazing of livestock on the fertilized areas.

This license amendment was discussed with your Mr. Shelley by W. A. Nixon of my staff on June 6, 1980.

FOR THE NUCLEAR REGULATORY COMMISSION

R. G. Page, Acting Chief
Uranium Fuel Licensing Branch
Division of Fuel Cycle and
Material Safety

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DOCKET NO.: 40-8027, Amendment No. 11

APPLICANT: Kerr-McGee Nuclear Corporation

FACILITY: Sequoyah Uranium Hexafluoride Production Plant

SUBJECT: SAFETY EVALUATION REPORT - LICENSE AMENDMENT APPLICATION TO AUTHORIZE THE USE, ON A PERMANENT BASIS, OF TREATED SOLVENT EXTRACTION RAFFINATE AS A FERTILIZER MATERIAL ON KM OWNED LAND

REVIEWER: W. A. Nixon

Background

Commencing in 1973 and repeated each year through April 1, 1979, USNRC has issued Amendments to license SUB-1010 to authorize a test program to investigate the effects of using treated raffinate as a fertilizer material under closely controlled conditions on Kerr-McGee (KM) owned land.

The treated raffinate solution contains mainly ammonium nitrate and metal salts along with small quantities of uranium and its decay products. The concentration of the radionuclides in the solution are all at least one order of magnitude below the 10 CFR 20 allowable concentration for release to unrestricted areas. Descriptions and safety evaluations of the tests can be found in KM submittals and in Safety Evaluation Reports dated May 4, 1977, July 7, 1978 and April 13, 1979.

By letter dated January 29, 1980, KM requested authorization to use treated raffinate as fertilizer on a permanent basis and to expand the fertilizer program to an additional 885 acres of KM owned land surrounding the Sequoyah UF_6 plant. Additional information on this application was received by letter dated April 13, 1980, and the 1979 test results were transmitted by letter dated April 15, 1980.

Discussion

The concentration of the radionuclides in the treated raffinate are at least one order of magnitude below the allowable concentration for release to an

unrestricted area; therefore, the probability of contaminating the site by the raffinate testing is unlikely and this has been demonstrated by results obtained during several years of testing. Reports submitted by KM have shown that there were no measurable increases of radionuclides (U, Th and Ra) in the samples of soil, vegetation and water taken from the testing area. Further, the environmental impacts resulting from the use of treated raffinate during the past few years are the same as those that would be expected from the use of commercially available ammonium nitrate fertilizer. Finally, in a 1979 test, no differences were detected between cattle grazed on pasture treated with commercial fertilizer and those grazed on pasture treated with ammonium nitrate contained in treated raffinate.

The present application proposes that permission to use treated raffinate as fertilizer on KM owned land be granted on a permanent basis rather than by yearly license amendments. The application also includes a request for expansion of the area to be used for the fertilizer program by an additional 885 acres (total for 1979 was 730 acres). Further, the current application reduces the number and frequency of soil, water and vegetation analyses.

Expansion of the fertilizer treated area will provide KM with a method of disposal for about 25% of the annual production of raffinate. The remaining 75% will accumulate and be stored in lagoons pending a solution to the KM raffinate disposal problem. Both expansion of the fertilized area and permission to use treated raffinate as fertilizer on KM owned land on a permanent basis are justified by the results of past experimental tests.

Previous experience in the experimental use of raffinate as fertilizer also justifies reducing the number and frequency of analyses of soil, vegetation and water. However, well water sampling during the period of fertilizer application should be continued as a check on over-application and this requirement has been included in the proposed Amendment.

A condition has been included in the proposed Amendment to limit the Ra-226 concentration and minimum pH of treated raffinate. This will, indirectly, require proper operation of the treatment system and serve as an upper limit on radioactivity added to the soil through raffinate application. Another condition has been added to require evaluation of the neutralization and barium treatment system so that specific limits may, in the future, be placed on Ra-226, Th-230 and U as a function of Total N in the treated raffinate. In addition, a condition has been included which limits the annual use of raffinate, per acre treated, to 700 pounds of total nitrogen. The object of this condition is to insure that over-application which could result in elevated nitrate concentration in groundwater does not occur.

Other conditions related to the proposed permanent use of treated raffinate include a restriction on using treated raffinate closer than 100 feet to any house, school or business and a requirement that an annual report on the fertilizer usage and results be supplied to NRC by May 1 of each year.

Conclusion

Based on the results of earlier test applications of treated raffinate as fertilizer, and subject to the conditions described above, I conclude approval of the application for expanded use of treated raffinate on a permanent basis will not constitute an undue risk to public health and safety or have significant adverse environmental impacts. I recommend that the amendment, as conditioned, be approved.

W. A. Nixon
Uranium Process Licensing Section
Uranium Fuel Licensing Branch
Division of Fuel Cycle and
Material Safety

Approved by: _____
W. T. Crow, Section Leader