

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

file
Kerr-McGee
Hearing

AUG 22 1973

Note to D. A. Nussbaumer *OK*
DN

KERR-MCGEE DEEP WELL DISPOSAL

A meeting will be held in Tulsa, Oklahoma on August 27, 1973 between representatives of the Regulatory Staff and Kerr-McGee to frame a joint statement of the issues expected to be brought before the Atomic Safety and Licensing Board at the rescheduled hearing as directed at the August 14th prehearing conference. The meeting will be attended by J. E. Rothfleisch of our staff, R. E. Kinsey, Jr. of OGC and Dr. D. L. Warner of the Missouri School of Mines representing the AEC and by F. S. Irvine, Kerr-McGee counsel, H. J. Gruy of H. J. Gruy and Associates, and others representing Kerr-McGee Corporation.

L. C. Rouse

*We will review and comment
on the draft statement following
the meeting before it is finalized
and sent to the Board.*

DN
Don - Should you attend?

cy -
No, not at this stage. I
talked to Kinsey when the
meeting was being set up
and he said no need for
me to attend.

Dyn

Kerr McGee Proposed Deep Well Disposal -- Case History

Kerr-McGee Corporation applied for an AEC source material license on September 23, 1969 to authorize the conversion of uranium concentrates (yellowcake) to uranium hexafluoride. The application also requested approval to dispose, by deep well injection, of liquid waste containing concentrations of radioactive materials in excess of those permitted to be released into unrestricted areas pursuant to 10 CFR Part 20, "Standards for Protection Against Radiation". An addendum to the application was filed on January 14, 1970 providing additional information requested by AEC to support the initial application. An amendment to the application was also filed on February 3, 1970 deleting the request for approval of raffinate disposal by deep well injection but including the use of the well for disposal of slightly radioactive miscellaneous chemical wastes. As a result, Source Material License No. SUB-1010, which had been issued previously to cover the storage of yellowcake, was amended in its entirety and reissued on February 20, 1970 with an expiration date of February 28, 1975. This license authorized the production of uranium hexafluoride in accordance with the procedures described in the application as supplemented, except that the disposal of liquid waste containing radioactive constituents by injection into a well was specifically not authorized.

On April 10, 1970 Kerr-McGee requested that their license be amended to permit the subsurface disposal of the solvent extraction raffinate stream

while releasing all other treated liquid wastes to the Illinois River. On the basis of detailed evaluations of the data submitted in support of this request by the AEC staff, by Mr. Robert Schneider, Chief, Office of Radiohydrology, USGS and by Dr. D. L. Warner, Professor, University of Missouri-Rolla, it was concluded that the subsurface injection of the raffinate constitutes a potential long-range hazard. Accordingly, the licensee was advised by letter dated October 15, 1970 that the requested amendment was denied for the following reasons:

- (1) The estimated fluid movement was based on assumptions that are contraindicated by the data submitted in that the highly variable permeabilities reported would be expected to result in extremely variable movement rates.
- (2) Knowledge of the detailed geology of the area, specifically the location of fault and fracture zones, was insufficient to permit accurate prediction of fluid movements.
- (3) The escape of radioactive material to an unrestricted area is not amenable to any foreseeable effective corrective action.
- (4) The geologic and hydrologic data and analysis presented in the application do not support the conclusion that waste fluids containing radioactive materials will remain confined.

Following the denial of this application, the licensee decided not to request a hearing and instead requested permission to withdraw the application without prejudice to the filing of a new application at a later

date. This request was approved by letter dated March 18, 1971.

On May 10, 1972, the licensee again submitted an application requesting that License No. SUB-1010 be amended to permit the deep well disposal of the raffinate waste stream being generated at the Sequoyah facility. Review and analysis of the information contained in the new application by geology consultants and USGS resulted the same conclusions as before for substantially the same reasons and the amendment request was denied by letter dated September 29, 1972. As a result of this decision, the licensee requested an informal meeting with the AEC staff and consultants to review the Arbuckle Formation reservoir study in greater detail than had been presented in the application. At this meeting, held in the Phillips Building, Bethesda, Md., on November 20, 1972, the licensee and consultant, H. J. Gruy and Associates, presented additional geological data and expanded their technical arguments supporting the latest application. After consideration of this additional information by the AEC staff and consultants, the September 29, 1972 denial was affirmed by letter dated March 14, 1973. On April 5, 1973, the licensee requested a hearing on the matter of the denial, pursuant to the provisions of 10 CFR Part 2.103.

As stated in the Notice of Hearing published in the Federal Register, Vol. 38, No. 135, Monday, July 16, 1973, pursuant to the Atomic Energy Act of 1954, as amended, and 10 CFR Part 40, the application

of May 10, 1972 was denied after determining that issuance of the license amendment would not conform with the requirements set forth in 10 CFR Part 40.32 (c) and (d) because:

- (1) Existing information is not adequate to demonstrate the presence, location, or nature of the faults that are purported to provide barriers to movement of fluid from the disposal formation, nor is there adequate information to demonstrate that known faults will act as barriers to such movement during continued operation of the proposed well.
- (2) The complexity of the geologic formation is such that there is no assurance as to the migration paths of the radioactive wastes and the brines which would be displaced.
- (3) The complexity of the geologic and hydrologic system effectively precludes emergency recovery of the injected radioactive waste.

The Atomic Energy Commission does not have an established policy regarding deep well disposal of radioactive or chemical liquid wastes. Each case is decided on an individual basis after considering all available information and weighing the probable radiological and environmental consequences against the benefits to be derived from the contemplated action. In the present case, the major objection

to the disposal of the solvent extraction raffinate by deep well injection is the lack of assurance that the radioactive wastes will remain confined in the Arbuckle Formation. Although the licensee indicates that the known faults in the area will provide barriers to the movement of fluids, these and other unknown faults or fracture zones may instead provide paths for the flow of injected fluids and natural brines to the other formations or to the surface. Moreover, the licensee has indicated in recent correspondence that the Arbuckle at the well "was saturated with highly mineralized liquid containing a total of approximately 140,000 parts per million dissolved solids and radium 226 at a concentration of approximately 1400 pCi/l." Thus it may be postulated that any type of fluid injected into the well will cause a buildup of pressure in the injection zone and will eventually force the radioactive brine to the surface. Of concern is the possibility that the waste solutions or brines will emerge in the Arkansas River Valley where the alluvium downstream from the site is a source of domestic water supplies.

A second objective to the proposed deep well disposal of the raffinate is the irreversibility of the action in that once the material is pumped down the well and radioactive fluids start to appear at a monitoring location in an unrestricted area, there does not appear to be any practical way to stop the continued spreading of the contamination.

FER
8/9/73

UNITED STATES OF AMERICA
ATOMIC ENERGY COMMISSION

File
Kerr-McGee
Hearing

In the Matter of)	Amendment to Source
)	Material License
KERR-MCGEE CORPORATION)	SUB-1010
KERR-MCGEE BUILDING)	
OKLAHOMA CITY, OKLAHOMA)	

CERTIFICATE OF SERVICE

I hereby certify that copies of PREHEARING CONFERENCE ORDER AND NOTICE OF EXTENSION OF TIME TO INTERVENE dated August 14, 1973 in the captioned matter have been served per the following by deposit in the United States mail, first class or air mail, this 15th day of August 1973.

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Office of the Secretary of the Commission

cc: Mr. Farmakides
Mr. Kinsey
Reg. files
ASLBP
ASLAB