SEP 18 1985

The Honorable Dale Bumpers
United States Senate
Washington, D. C. 20510

Dear Senator Bumpers:

This is in response to a request from U. S. Environmental Protection Agency, Dallas, Texas, that we reply to you directly concerning matters addressed by Mr. [redacted] of Little Rock, Arkansas. These matters are concerned with spills and discharges from the Sequoyah Fuels Facility at Gore, Oklahoma. Mr. [redacted] concerns appear to be based upon a report by Mr. Richard Phillips, who examined documents in the local public document room at Sallisaw, Oklahoma, and drew certain conclusions stated in the report. The report is titled, "The Kerr-McGee Uranium Processing Facility near Gore, Oklahoma: A Case Study in Radioactive Waste Management." The NRC licensing staff has responded to the assertions and findings of this report and I have enclosed the NRC response for your review.

Since NRC Region IV has had inspection responsibility at this facility since it was licensed in 1969, we believe we can respond to the five concerns raised by [redacted] based upon our experience with this facility and documents maintained in our files.

1. "Settling basin overflow in Spring 1972, not mentioned in the Draft Environmental Impact Statement."

   The NRC published the Final Environmental Statement (FES) in February, 1975. The intent of the FES was to describe, generically, the various accident scenarios possible and their environmental impacts. The FES does not attempt to describe each incident that may have occurred onsite. The FES does describe a gross settling basin rupture and releases of material offsite, a situation far more serious than a basin overflow. The FES concluded that this type of release presented an acceptable risk to the public health and safety.

2. "Spillage of 1450 pounds of uranium hexaflouride into a surface stream on December 1, 1978, which was not reported to the press and public for over one year."

   The licensee reported the incident to us by telephone on December 1, 1978. An NRC inspector was dispatched to the site where a complete investigation was conducted on December 4 and 5, 1978. No violations of NRC requirements were identified. The NRC inspection report (40-08027/78-02) on the incident was issued on January 10, 1979, with a copy to the local public document room.

3. "A major spill of radioactive waste around December 1980, contaminating a surface stream, that was not reported to the Nuclear Regulatory Commission."

Ex. 7c
Ex. 7c

Mr. is correct that the licensee did not report any radioactive waste spills in this time frame. Furthermore, the NRC has no knowledge of any such waste spills. Perhaps Mr. is referring to a small spill of nitric acid in December of 1980, which resulted from a hose break and was contained completely onsite. Ex 7C

4. "A pipeline rupture releasing approximately 3,000 gallons of liquid waste into a drainage ditch, which was reported to the NRC."

   The licensee reported this incident on February 9, 1982. The NRC investigated the matter and our findings are documented in NRC Inspection Report 40-08027/82-01. Three thousand gallons were not released. The raffinate tank contained 3,000 gallons and a portion of this was released to a drainage ditch designed to collect any releases from a pipe rupture. The inspector judged that a substantial portion of raffinate released from the rupture was absorbed in the surrounding ground areas and only a small fraction was likely to have reached the site boundary. The licensee's clean-up efforts and corrective actions were reviewed and approved by the NRC.

5. "Highly radioactive wet sludge settled at the bottom of the raffinate (liquid waste) pond #2 has been leaking continuously into the groundwater for ten years."

   The NRC has evaluated the environmental impacts of the continued operation of the Sequoyah Facility in the Environmental Assessment (NUREG-1157) dated August 1985. As a result of this Assessment, a finding of no significant impact was prepared and published in the Federal Register. In chapter 4 of the Environmental Assessment, it was noted that leakage from pond 2 had caused contamination of soil and groundwater beneath the pond. Sequoyah was required to decommission pond 2 and remove all sludge to a plastic-lined pond for temporary storage. The licensee has an array of monitor wells onsite to monitor the extent of any contamination from site operations. Groundwater in the near surface Atoka Formation is generally not useable because of poor yields and high concentrations of salts.

I hope this information will satisfy your concerns concerning this facility. Please be in touch if you need additional information.

Sincerely,

(Signed) T. A. Rehm

for William J. Dircks
Executive Director for Operations

Enclosure:
As stated

OGC 9/11/85

cc w/enclosure: (see next page) TRANSMITTED VIA 5520 FROM RIV

RIV:NMSS	R&SPB	NMSS	D:DRS&S	RA	EDO	LEDO
RJEverett	REHall	WCrow	RLBangart	RDMartin	WJDircks	LGibbs
09/13/85	09/13/85	09/13/85	09/13/85	09/13/85	09/15/85	9-16-85

JUN 7 1985

ENCLOSURE

Comments on Report Titled "The Kerr-McGee Uranium Processing Facility Near Gore, Oklahoma: A Case Study in Radioactive Waste Management- by R. H. Phillips."

Major Concerns on Waste Management

1. Recommendation in Report to Handle Kerr-McGee's Liquid Wastes

To dispose of the raffinate generated onsite, the author recommends that NRC require Kerr-McGee to build more "evaporation" ponds rather than relying on deep-well injection or on fertilizer application. The NRC does not consider these ponds at Sequoyah to be effective evaporation ponds, since the rainfall and evaporation rate are about the same. The evaporation process is effective only when there is a substantial difference in evaporation rate and rainfall such as in a semi-arid area. By letter dated November 20, 1984, Kerr-McGee applied for a license amendment to allow construction and use of a new pond for raffinate storage. This pond has a planned liquid capacity of about 12.75×10^6 gallons (License Amendment No. 28). The new pond is needed since Kerr-McGee's proposed deep-well injection project is on hold and the fertilizer program only utilizes a portion of the raffinate generated. Although construction of this new pond has been approved, the NRC staff considers that continued expansion of ponding capacity is undesirable since any liquid storage pond provides a potential for leakage of liquid wastes into subsurface soil and groundwater.

At present, the deep-well injection of raffinate and the fertilizer application program are the only two methods proposed by Kerr-McGee to dispose of the raffinate. Kerr-McGee has been encouraged to explore other alternatives for permanent disposition.

2. Recommendation in Report to Isolate Wet Sludge

The author recommends that NRC require Kerr-McGee to build another pond to isolate the wet sludge stored in pond 2.

The NRC staff, in license amendment No. 28, has specified that Kerr-McGee decommission pond 2, and transfer all the sludges to a new plastic-lined pond with adequate capacity to hold the sludge in Pond 2 and also the sludge from the clarifiers. This new pond is in addition to another new spare pond to be used for raffinate. The staff feels that this will provide a more effective temporary liquid and solid waste storage system to minimize the potential for adverse environmental impact. In addition, in license amendment no. 25, the staff required Kerr-McGee to submit a comprehensive plan for the disposal of solid waste generated as a result of licensed operations.

Technical Analysis in Report

1. Wet Settled Sludge of Pond 2 Resulting in Greatest Measured Surface Water Contamination

The staff has reviewed the surface monitoring data submitted by Kerr-McGee and found that the uranium concentration in surface water is well below 10 CFR Part 20 limits. It appears that the author miscorrelated the uranium concentration in river sediment as the uranium concentration in surface water (p. 15 of Report). The author considered 1 µg or uranium per gm of sediment is equal to 1µg of uranium per ml of surface water and interpreted the sediment data as surface water concentration.

Kerr-McGee's routine discharge of uranium bearing liquid wastes into the Illinois River is well within the NRC's maximum permissible concentration (MPC) in 10 CFR Part 20. However, the quantity of uranium discharged has averaged about 5,000 kg of uranium per year based on the past few years data. The liquid waste is discharged through a low-flow natural drainage ditch. Because of ion exchange and post precipitation there will be some uranium deposited in this ditch resulting in higher sediment concentration. A very small fraction of the 5000 kg of uranium deposited on the sediment can cause the elevated concentrations listed in Table 2 of the Report (p. 14). It is the staff's opinion that the elevated uranium concentration in sediment is caused by the aforementioned mechanisms and not the sludge from pond 2. The staff does not expect that the uranium in pond 2 would seep through more than a few feet because of the effect of ion-exchange in the soil.

The staff is concerned with the accumulation of uranium in bottom sediment of this ditch because it may eventually add to the problem of solid waste disposal when the plant is decommissioned. The staff requested Kerr-McGee to propose a better system for transferring liquid wastes from the plant to the Illinois River.

2. Uranium and Raffinate Spill and Unreported Spill into Streams

The author attempted to correlate the sediment concentrations with the events of accidental spills which occurred in past years From the information submitted by Kerr-McGee, the largest accidental spill was on December 1, 1978 when 658 kg uranyl nitrate (UNH) spilled into the natural drainage ditch resulting in an elevated uranium concentration in the sediments. The uranium concentrations in the sediment appear to have decreased in the following years and until the concentration started increasing in December 1980. The author speculated that there may have been another major spill which was not reported to NRC. As discussed above, the average annual discharge of uranium into the stream is about 5,000 kg, and the continued discharge of this quantity of uranium every year should outweigh the spill of 658 kg UNH in 1978. The uranium concentrations in the sediment along the stream could have sporadic values depending on the locations and the river flow carrying the sediment downstream. Therefore, the elevated values of the uranium in sediments is mainly a result from the past years of discharge.

The concentration in the sediment should not be misinterpreted as the same concentration as surface water. This misinterpretation leads to the incorrect analysis and conclusions at various places of the report.

3. Deep Well Injection Project

a. The reference to Barium-236 on page 1 is incorrect and is probably supposed to be Radium-226. There is no such isotope as Barium-236. In the early years of the injection proposal, the principle radiological contaminant in the raffinate was Radium-226.

b. The description of the Arbuckle and overlying geologic formations (pages 1 and 2) does not put in proper context how these aquifers are used or what their natural groundwaters are like. It should be made clear that the natural groundwater quality in the Arbuckle Formation is extremely poor, including a reported Radium-226 concentration of 1,400 pCi/l, and that the formation is principally used as an injection reservoir in other areas of the State. Likewise, groundwater in the near-surface Atoka Formation is generally not useable because of very poor yields and high concentrations of salt.

c. The following statement on page 4 is incorrect and is a misquote: "AEC believed that if such faults do exist, they will act not as barriers to fluid movement, but as potential flow paths for vertical fluid movement (Nussbaumer, 1973, pp. 8-9)." Mr. Nussbaumer's statement was actually as follows: "Nor does the staff believe, based on the data and information provided to it by its expert consultants, that the applicant has made an adequate showing of the nature of these faults or that these faults, if they do exist, will, in fact, act as barriers to fluid movement as opposed to potential flow paths for fluid movement." In other words, there was never sufficient evidence to conclude whether any existing faults act as barriers or conduits for fluid flow, and if they act as conduits, whether any preferential flow would be lateral or vertical.

Responses to Section 5. "NRC Approves Plan For Deep-Well Injection of Radioactive Waste"

1. The first paragraph in Section 5 uses a quote out of context, is misleading, and does not tell the whole story. The paragraph states: "The new application by Kerr-McGee was 'a duplicate of the application denied' in 1969, 1970, 1972 and 1974 by the old AEC (Fonner to Page, 10/27/82, p. 2)." The referenced memorandum discussing the new application actually says:

> "Thus the decision of January 18, 1974 is binding upon the staff to the extent the present application is a duplicate of the application denied."

It is then further stated:

"There are in this case, however, both supervening developments with material bearing on previously litigated factual issues, and an unusual factor having public interest implications. The supervening developments bearing on litigated factual issues are (1) a change in composition of the raffinate, and (2) an additional monitoring well. The unusual factor having public interest implications is the development in recent years of the EPA underground injection control program pursuant to the Safety Drinking Water Act ...."

Therefore, the new application was not a duplicate of the previous one and, unlike what is implied in Mr. Phillips' paragraph, the NRC did not purposefully search for and "select" reasons to justify approval, but rather was obligated to evaluate the real differences that existed between the two applications. In addition, at the time of the new application, a comprehensive Federal program controlling undergound injections was in place and the State of Oklahoma, being the administering body, had already issued a permit for the Kerr-McGee injection well subject to several restrictions. This regulatory program and state control is never mentioned by Mr. Phillips.

2. On page 21 it is stated, "NRC accepted without question Kerr-McGee's figures showing 'significant changes ... in the raffinate composition' since the old AEC's rejection of Kerr-McGee's plan to inject raffinate waste into the Arbuckle Formation (Page to Shelley, 5/18/83, Attachment, p. 1; and Fonner to Page, 10/27/82, p. 3)."

The raffinate composition was accepted based on years worth of results (since 1973) of additional raffinate treatment. As an alternative to deep well injection in the early 1970's, Kerr-McGee began to additionally treat the raffinate to determine if it could be used as a fertilizer. The NRC permitted limited use of the treated raffinate as fertilizer with controls imposed on the raffinate quality. By 1982, based on years of testing, broad use of the treated raffinate as fertilizer was approved with the restriction that the treated raffinate meets quality criteria for radiological and nonradiological contaminants. Therefore, by the time Kerr-McGee reapplied to use the injection well, considerable testing of the treated raffinate had already been done and its quality was known.

3. Dr. Don L. Warner, Dean of the School of Mines at the University of Missouri at Rolla, served as an expert consulting geological engineer for the AEC during the review of each application to use the injection well in the early 1970's. Because of his intimate knowledge of the case, Dr. Warner also provided technical input to the NRC's review of Kerr-McGee's application in 1982. Dr. Warner documented his findings in a final report dated March 1983. This report, which is available in the Local Public Document Room, presents a detailed analysis of the safety issues related to the proposed injection and served as the technical basis for NRC's approval to dispose of 5 million gallons; however, none of Dr. Warner's conclusions regarding safety are presented by Mr. Phillips.

4. The treated raffinate is not safe to drink. The concentration of Radium-226 (which is of concern because it will likely remain in solution and flow with the waste) is now below the EPA's limit for public water supplies. There is not a drinking water standard for uranium or thorium, but the sum concentration of these elements exceeds the gross alpha limit of 15 pCi/l in drinking water. It is expected, however, that most of the uranium and thorium would precipitate in the injection well by reaction with limestone and would not escape in the case of leakage. There are also concentrations of certain metals in the treated raffinate that exceed drinking water criteria. At the same time, natural groundwater in the Arbuckle Formation is also not safe to drink.

cc w/enclosure:
Dick Whittington, Regional Administrator
EPA, Region IV

Dr. Ron Jarman
Oklahoma Water Resources Board

Mr. Fred Walker
Oklahoma State Department of Health

Dr. Phyllis Garnett
Arkansas Department of Pollution Control & Ecology

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EDO 581
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

EDO PRINCIPAL CORRESPONDENCE CONTROL

FROM:

SEN. BUMPERS
(REFERRED TO NRC FROM EPA BY
LETTER DATED 8/14/85)

DUE: 09/13/85

EDO CONTROL: 000955
DOC DT: UNDATED
FINAL REPLY:

TO:

FOR SIGNATURE OF:

EXECUTIVE DIRECTOR

** GREEN **

SECY NO:

DESC:

ENCLOSES LETTER FROM [ ] RE RADIOACTIVE WASTE SPILLS AT KERR-MCGEE SEQUOYAH FACILITY FOR URANIUM PROCESSING

ROUTING:

DAVIS
GCUNNINGHAM
OCA
SECY

DATE: 09/30/85
ASSIGNED TO: RIV CONTACT: RMARTIN

SPECIAL INSTRUCTIONS OR REMARKS:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VI
INTERFIRST TWO BUILDING, 1201 ELM STREET
DALLAS, TEXAS 75270

AUG 14 1985

Honorable Dale Bumpers
United States Senate
Washington, D.C. 20510

Dear Senator Bumpers:

Ex. 7c Thank you for getting in touch with me on behalf of Mr. [redacted] of Little Rock, Arkansas, who wrote to you concerning operations at the Kerr-McGee facility in Gore, Oklahoma. I have reviewed the situation and offer the following information.

Ex. 7c Upon receipt of Mr. [redacted] letter enclosing Mr. Richard Phillips' report, my staff contacted the Nuclear Regulatory Commission (NRC) in Arlington, Texas. Based on our discussions with NRC staff, we believe the NRC has jurisdiction over the types of radioactive releases referenced in the Phillips study. By copy of this letter, I am forwarding a copy of Mr. Ex. 7c [redacted] inquiry and the report to Mr. R. J. Everett at the NRC and asking that he reply directly to you.

In addition, the Oklahoma State Department of Health (OSDH) has conducted a study of the potential adverse environmental health impacts resulting from operations at the Kerr-McGee facility. A report is expected shortly, and by copy of this letter, I am asking the OSDH to provide you a copy. If the report indicates a problem, we will coordinate our efforts with both the NRC and the OSDH to resolve the problem.

I appreciate your interest and concern, and I hope this information is helpful to you. If I may be of further assistance, please let me know.

Sincerely yours,

/s/ Frances T. Phillips for

Dick Whittington, P.E.
Regional Administrator

cc: Mr. R. J. Everett
Nuclear Regulatory Commission

Mr. Fred Walker
Oklahoma State Department of Health

Dr. Ron Jarman
Oklahoma Water Resources Board

Dr. Phyllis Garnett
Arkansas Department of Pollution Control & Ecology

July 25, 1985

Senator Dale Bumpers
229 Dirksen Senate Building
Washington, D.C. 20510

Attention: Susan Rieff

Subject: Radioactive waste spills, leaks and seepage into the Arkansas River and groundwaters

Dear Senator Bumpers:

I have received information from friends in Fort Smith and Alan, Oklahoma that indicates the possibility that for approximately the past fifteen years on occasion serious mishaps with the operation of the Kerr-McGee Sequoyah Facility for uranium processing near Gore, Oklahoma could have resulted in the contamination of the Arkansas River and groundwaters with concentrations of uranium, radium and thorium.

I am enclosing herewith a 30 page report compiled by Richard Hayes Phillips, M.A. entitled "The Kerr-McGee Uranium Processing Facility near Gore, Oklahoma: A Case Study in Radioactive Waste Management". This report is compiled from official documents available in the Sallisaw, Oklahoma City Library.

In regard to the area of responsibility of the Environmental Protection Agency, I believe the following examples of alleged spills, discharges and seepages of radioactive materials are sufficient to warrant serious concern and investigation:

1. Settling basin overflow in spring, 1972, not mentioned in the Draft Environmental Impact Statement;

2. Spillage of 1,450 pounds of uranium hexaflouride into a surface stream on December 1, 1978, which was not reported to the press and public for over one year;

3. A major spill of radioactive waste around December 1980, contaminating a surface stream, that was not reported to the Nuclear Regulatory Commission;

4. A pipeline rupture releasing approximately 3,000 gallons of liquid waste into a drainage ditch, which was reported to the NRC;

5. Highly radioactive wet sludge settled at the bottom of raffinate (liquid waste) pond #2 has been leaking continuously into the groundwater for ten years.

These mishaps have resulted, according to the Phillips report, in concentrations of uranium, radium and thorium in surface effluent streams at measured quantitities much higher than permissable levels. There is evidence of protracted and numerous cited violations by the EPA over a period of years for illegal spills and discharges from this operation.

My reading of the Phillips report suggests that there is no way these spills, discharges and seepage could be anything other than radioactive, and that the public in both Oklahoma and Arkansas have a right to know the full extent of the problem and the potential damage to public health involved.

I appreciate your invitation to submit this material in time for your inclusion of it on the agenda with Mr. Dick Whittington, of Region 6 of the Environmental Protection Agency in Dallas, when you discuss the Vertac situation with him on Tuesday, July 30th.

We look to you, Senator Bumpers, to help us answer the serious questions raised in the Phillips report. Dr. Phyllis Garnett of the Arkansas Pollution Control and Ecology Department has told me that if uranium, radium and thorium have been released into the Arkansas River and groundwater aquifiers within 23 miles of the Arkansas state line that it is a matter of concern that deserves investigation.

In conclusion, I must say I am very grateful that I have a Senator like you that I can consult on such a matter, and I am most appreciative of your leadership on issues of great importance to the well-being of the citizens of Arkansas.

Thank you for your consideration of this matter,

Sincerely,

cc: Don Floyd