

40-8021

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August 29, 1975



Mr. R. B. Chitwood, Chief
Fuel Cycle Environmental
Projects Branch
Division of Materials and
Fuel Cycle Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Chitwood:

Enclosed is the report outline suggested by me in my July 17 letter to you and subsequently authorized by Mr. Flack. Accompanying the outline are several pages of comments on the report content and on material from other sources that could be included in it. At this point, it appears to me that only Kerr McGee can actually prepare the report without an undue expenditure of effort on the part of anyone else in obtaining all of the material that may be in the Company's possession.

I hope that, if Kerr McGee Corporation is requested to prepare the report that is outlined, they understand that it is intended to allow them the opportunity to avoid unnecessary additional field studies by making maximum use of the data in their possession already.

If there are any questions concerning the outline or comments, I will be pleased to try to answer them.

Sincerely yours,

A handwritten signature in cursive script that reads "Don L. Warner".

Don L. Warner
Consulting Geological
Engineer

DLW:def

Enclosure



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Report Outline

Report on Waste Retention Ponds at Kerr McGee Corporation Sequoyah Plant

- I. Introduction
 - A. Statement of problem
 - B. Scope and organization of report
- II. Site Characteristics
 - A. Location, topography, drainage
 - B. Geology
 - 1. Rock units
 - 2. Soils
 - 3. Structure
 - C. Hydrogeology
 - 1. Water bearing properties of rocks and soils
 - 2. Occurrence of groundwater
 - 3. Groundwater quality
 - 4. Groundwater use
- III. Construction and operation of disposal ponds
 - A. Design and construction
 - B. Operational history
 - C. Future plans
- IV. Water Quality Monitoring
 - A. Monitoring network and procedures
 - B. Analysis of monitoring data
- V. Conclusions and Recommendations

Discussion of Report Outline

I. Introduction

A. Statement of problem - in this section a brief explanation should be given of the incidents that have led to the need for the report, including review comments generated by the environmental report and statement, subsequent discovery of a pond leak in 1974, and resultant suggestions by DOI.

B. Scope and organization of report - lay out for the reader the content and report arrangement.

II. Site Characteristics

A. Location, topography, drainage - Describe for the reader the geography and physiography of the plant site. This is discussed in the environmental report and statement. A topographic map with contour intervals of 10' and a scale of 5" = 1000' is included as Exhibit F of Kerr McGee's April, 1970, feasibility report on the disposal well. A site map is included as Exhibit H, Enclosure 1, of the May 10, 1972, Application for Amendment to License No. SUB-1010, Docket No. 40-8027. The site map, Enclosure 1, also references the availability of drawings showing boring logs, soils profiles, and the settling basins and lagoon. The locations of all trenches, test holes and monitor wells that are discussed later should be on one master map that also shows the topography, drainage, basins, and lagoons.

B. Geology - The principal content of this section should be a detailed discussion of the geology of the surficial deposits and of the outcropping Atoka Formation to the depth of the first saline water units. The preparation of a report of this type is mentioned

in the July 26, 1974, letter from W. J. Shelly, to J. E. Rothfleisch, but I have not received such a report. This section on the shallow geology will have to be sufficient to satisfy the DOI comment on the inadequacy of geologic information that appears on page C-17 of the Final EIS. I completely concur with DOI's comment.

As an appendix to this section, the logs of all shallow boreholes should be compiled. Profiles such as Fig. 12, p. 87 of the Supplemental Environmental report are useful, as is the shallow west-to-east cross section (Exhibit E, Appendix B) included in the April, 1970, injection well feasibility report. Any data on original water levels in test holes should be compiled as well as the geology.

C. Hydrogeology -

1. Water bearing properties of rocks and soils - Should be a discussion of the character of the units described in B as far as porosity, permeability, thickness, and areal extent. Any other factors such as ion exchange capacity, fracturing, etc., should be included that will help in interpreting how and where fluids that might leak from a pond would travel.

2. Occurrence of groundwater - Discuss the vertical and lateral distribution of subsurface water at and near the plant. Existing discussion in the various reports consists of one or two pages, is very general, and is principally based on a publication by Marcher. In order to estimate the effects of pond leakage, it will be necessary to develop a picture of the specific conditions at the plant site including elevation of the unconfined groundwater table, elevation of any perched water tables, and the elevation of at least the shallowest

confined fresh or brackish water aquifer and its piezometric surface. It is not known to what extent this can be accomplished with existing information, but it should be done in as much detail as possible to show the adequacy of the data on hand. This section will be critical to the determination of the need for possible additional site exploration.

3. Groundwater quality - The quality of uncontaminated shallow groundwater should be carefully documented. It is presently unclear exactly what the natural quality of shallow groundwater in the plant area originally was. Monitor well data shown in the environmental report for the wells in the vicinity of the disposal ponds begin in 1971, when the plant was already in operation. The fact that preoperational samples were not taken from the monitor wells cannot now be corrected, but ranges of values and averages from wells outside of the plant area should provide a reasonable basis for comparison. It can be argued that samples from most of the monitor wells do not show hazardous levels of contamination, but it is still important to know what quality changes may have occurred during operation so that patterns of movement of the contaminants can be established.

4. Groundwater use - Because the significance of water quality depends on its use, a brief documentation should be provided of the location of nearby water users, the source of supply, volumes withdrawn, and the end use made of the supply. This is also necessary so that a reader unfamiliar with the area can judge the extent to which flow may be directed to areas of withdrawal.

III. Construction and Operation of Disposal Ponds

Discussion is provided in Supplements 1 and 2 to the Environmental Report concerning the construction and operation of the raffinate ponds. However, confusion still exists concerning some details. Exactly when was each pond constructed and what is its individual history of use, including dates and any notable incidents regarding the pond. How much waste has gone into each pond and can a mass balance of the present contents be made? What will be done with each of the ponds in the future and will they possibly be sources of groundwater contamination, even after they are no longer used?

IV. Water Quality Monitoring

A. Monitoring network and procedures - In this section, each sampling point in the water monitoring network should be described sufficiently to permit the reader to analyze its geologic and hydrologic significance. Geologic logs for the monitoring wells should have been provided in Section II-B and water levels in Section II-C-2, but a discussion of the wells should be included here. How often is each well sampled, how is it sampled, how are the samples stored, combined, analyzed, etc? What incidents, if any, have occurred during the operation of the network that should be particularly noted because of their effect on the monitoring results.

B. Analysis of monitoring data - Perhaps the weakest part of the various existing reports is the discussion of the monitoring data that is presented. This fact is reflected by the comments that I provided in my review of the Kerr-McGee Environmental Reports and by the comments of the DOI and Colorado State University. In response

to these comments, Kerr-McGee provided additional discussion in Supplement 2 that led to the conclusion that, "As a result of these detailed examinations, we believe that the integrity of the raffinate ponds has been demonstrated. It is concluded that any contamination appearing in the monitor wells is incidental to surface contamination and, at current low levels of airborne release, a substantial reduction in contamination in all future analyses will be observed."

The conclusion may be valid, but it doesn't appear obvious to me from the company presentation. For one thing, the pattern analysis isn't convincing without an evaluation of the volume of raffinate necessary to cause the observed variations in nitrate, fluoride, and radioactivity. If only a small volume of raffinate is required, then the pattern analysis is not sensitive enough to be useful. Also, as commented by DOI in the letter of April 2, 1975, to Mr. Chitwood, Kerr-McGee's interpretation of the observed pond leak is insufficient to be convincing. The outline developed here is intended to allow for an orderly analysis at this point. It is essential that no conclusions be reached in the final section that are not warranted by factual data in the body of the report. If it is not possible to develop a convincing analysis of the past, present, and future effects of the ponds on groundwater, then the existing deficiencies in information should be pointed out and recommendations made for the necessary action to correct them in the shortest time at the least cost.