

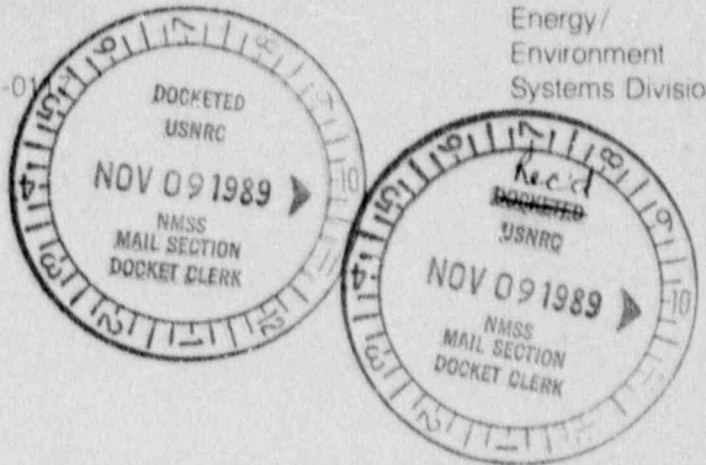
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Oak Ridge
Associated Universities
Post Office Box 117
Oak Ridge, Tennessee 37831-0117

Energy/
Environment
Systems Division

October 27, 1989



Mr. Leland C. Rouse
Division of Industrial and Medical
Nuclear Safety
Nuclear Regulatory Commission
Mail Stop 6H3
Washington, DC 20555

Subject: SCOPING STUDY - FORMER KERR-MCGEE FACILITY AT CUSHING, OKLAHOMA

Dear Mr. Rouse:

In response to the task request from your office, Oak Ridge Associated Universities (ORAU) has conducted a scoping study of the formerly licensed Kerr-McGee facility in Cushing, Oklahoma, to assess the current radiological status and need for further actions. The study consisted of a review of available NRC file documents, provided by your office and NRC Region IV, and more recent correspondence between Kerr-McGee and EPA; a September 13, 1989 meeting with representatives of Kerr-McGee, NRC, State of Oklahoma State Health Department, and EPA; a walking tour of the site on September 14, 1989; and a limited gamma radiation survey of selected areas on October 25, 1989. The findings and recommendations are provided below. Figure 1 is a drawing of the site, indicating the pertinent areas discussed further in the following report.

Findings

1. Kerr-McGee conducted activities with enriched, normal, and depleted uranium and natural thorium at this site under AEC licenses SNM-695 and SMB-664, between 1963 and 1966. Materials were received in the form of UF₆, mill concentrates, unirradiated scrap fuel elements, and various chemical compounds. Operations converted uranium to other compounds, suitable for use in the nuclear fuel cycle and produced metal alloys of uranium and thorium.
2. After operations were terminated in 1966, the site was decontaminated and surveyed by Kerr-McGee. Results of the survey summarized in a letter of June 9, 1966, indicated that the facility met established decommissioning guidelines. An inspection by representatives of AEC Region IV on July 6, 1966 confirmed the facility status reported by Kerr-McGee, and the licenses were terminated on July 25, 1966.

While the data contained in the Kerr-McGee letter of June 9, 1966, are in compliance with the guideline levels at that time, the letter only summarizes results and does not address the survey procedures and findings in sufficient detail for ORAU to evaluate the adequacy of the survey or the accuracy of those data. Discussions with Kerr-McGee indicates that additional documentation regarding that survey would, at best, be difficult to locate and may no longer exist. The reports by Kerr-McGee and Region IV did not address any areas of the site except the former process building

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complex. However, additional locations had been used for storage or disposal of low-level contaminated wastes, including discharges of wash water onto a hill in the northeast corner of the property and disposal of low-level decommissioning wastes in the northwest and southeast corner of the tank farm property, north of the site access road.

3. In 1977, Kerr-McGee performed additional property surveys and conducted cleanup of the northeast corner of the site, the "old Globe Property Dump" (location uncertain but presumably in the northwest or southeast corner of the property), and around portions of the former processing building. The removed soil and trash was placed into an existing refinery waste sludge pit (Pit 4) and covered with about four feet of clean soil. Following these actions, the land and buildings associated with the licensed operations were sold.

Kerr-McGee representatives were uncertain as to the availability of documentation describing these cleanup activities and results of follow-up radiological monitoring. Again it is considered likely that such information no longer exists or, if it does, would be very difficult to locate.

4. Between 1979 and 1982 additional decontamination and stabilization was performed by Kerr-McGee on the former process building, building access road, Skull Creek, and northwest, northeast, and southeast sections of the Kerr-McGee tank farm area. (At this time Kerr-McGee reacquired the property in the northeast corner of the tank farm). Soil and other wastes exceeding 50 $\mu\text{R/h}$ were sent to the Cimarron facility for further processing. Soil with an exposure rate between 30 and 50 $\mu\text{R/h}$ was placed in trenches on the northeast corner of the tank farm and covered with four feet of clean soil. (Kerr-McGee considered soils with 30 to 50 $\mu\text{R/h}$ as meeting the NRC's Branch Technical Position Option 2 concentration of 50 pCi/g of total thorium.) Soil with an associated gamma level below 30 $\mu\text{R/h}$ was left in place or deep plowed. Approximately 20 acres of land in the northeast corner was plowed and terraced to distribute residual contamination and protect the area against surface runoff.

The availability of detailed Kerr-McGee documentation on survey procedures and results is uncertain. The Oklahoma State Health Department participated in surveys of portions of the site; however, representatives from that Department also indicated that their documentation would be very limited.

5. Since 1986, EPA has conducted several limited surveys at the site and has confirmed the already known presence of thorium in Pit 4. No additional areas of significant residual radioactive material have been identified to date, according to the EPA reports I have reviewed. In my opinion, the EPA surveys are inconclusive and appear to leave many questions unanswered.

6. Portions of the Kerr-McGee property at the time of the licensed activities have been sold. Kerr-McGee still retains the major portion of the former tank farm area, including the region of known residue disposal in the northeast corner and the former disposal area in the northwest corner. The former process building site, adjacent lands, and the southeast corner of the former tank farm area have 6 to 10 different current owners.
7. On October 25, 1989, Scott Wical of ORAU, accompanied by representatives of the State of Oklahoma Health Department and Kerr-McGee, conducted a limited scoping survey of surface contact gamma radiation at several locations at the site. Locations monitored were the area around the former processing building, portions of Pit 4, the area south and southeast of Pit 4, the northeast corner of the Kerr-McGee property where materials have been placed in a trench and "blended" with the surface soil, and a scrap disposal area near former tank berms in the northwest area of the Kerr-McGee property. Monitoring was performed using a very sensitive gamma scintillation instrument. Because of the limited scope of this survey, no attempts were made to develop relationships between instrument responses and actual exposure rates or radionuclide concentrations; rather, the relative instrument responses and experiences with similar sites were used to roughly evaluate findings. The results of the monitoring confirmed the presence of general low-level radioactive material in the northeast corner of the site and around and in Pit 4. No evidence of residual radioactive material was noted south of Pit 4, along the natural surface drainage path or in an area reputed to be a former scrap storage or dump site. The survey did detect areas of previously identified residual low-level radioactive material outside and inside the former process building and in the vicinity of the former tank berms. On the basis of previous experience, it is my opinion that the low-level radiation and radioactivity levels noted during this survey do not pose an imminent health risk to site occupants or the public, under current conditions of site use. The findings do, however, indicate the presence of residual radioactive material at the former process building and in the northwest portion of the property. The relative direct gamma levels in these areas suggest that the concentrations of radionuclides may exceed the current NRC guideline values for property being released to unrestricted use.

Recommendations

The public, current property owners, and regulatory agencies will surely demand more conclusive documentation of the decommissioning actions and current radiological status of this site. This is particularly true, in light of the ORAU survey findings of late October. Kerr-McGee should review records for any pertinent information concerning these issues. It would also be prudent for Kerr-McGee to actively pursue a thorough characterization survey of the entire

Mr. Leland C. Rouse

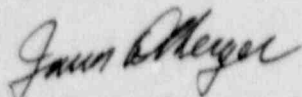
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site, as owned by Kerr-McGee at the time of the licensed activities, and any vicinity properties, including Skull Creek and other drainage pathways, where incidental contamination may have occurred. Radiological information that should be developed includes exposure rates, surface contamination levels, and radionuclide concentrations in soil. Locations of residual radioactive material exceeding current guidelines should be accurately defined and, as appropriate, controls implemented to prevent removal or inadvertent spread of contamination to adjacent properties.

If you have any questions concerning this information, please contact me at FTS 626-3305.

Sincerely,



James D. Berger, Director
Environmental Survey and
Site Assessment Program

JDB:jls

Enclosure

cc: D. Tiktinsky, NRC/NMSS
W. Fisher, Region IV
G. LaRoche, NRC/NMSS

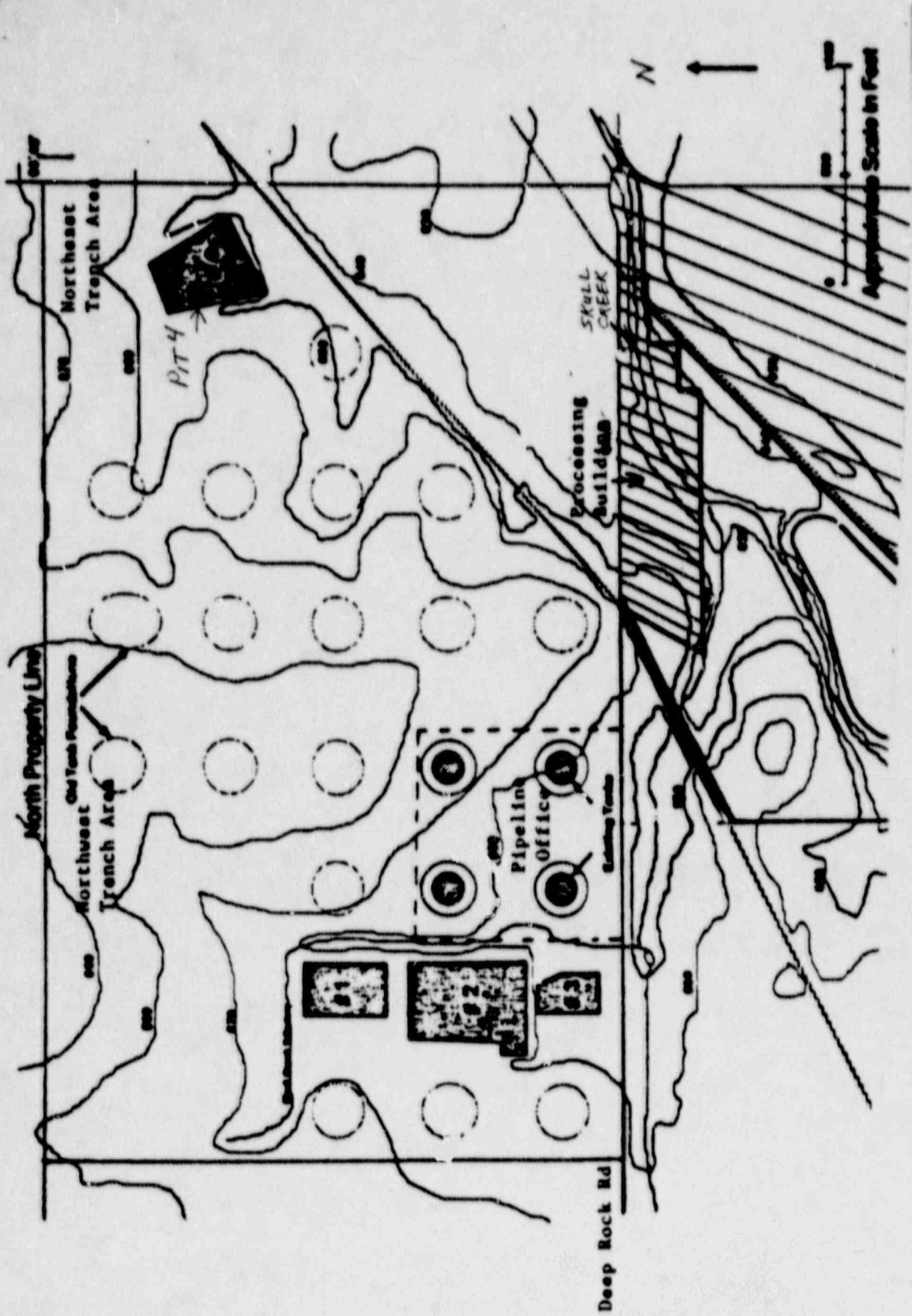


FIGURE 1.