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Docket No. 40-1341
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MEMORANDUM FOR: Docket File No. 40-1341

FROM: Edward F. Hawkins, Project Manager
Licensing Branch 1
Uranium Recovery Field Office, Region IV

SUBJECT: REVIEW OF COTTONWOOD CREEK CROSSING AND INTERNAL DRAINAGE TRENCHES DESIGNS AND FIELD SCALE MATERIAL PLACEMENT TRIAL - EDGEMONT DECOMMISSIONING

Background

By letter dated September 19, 1983, TVA submitted their plans for the Edgemont Uranium Mill decommissioning. The submittal included mill site decommissioning and disposal site designs. On September 22, 1983, TVA met with the URFO staff to brief us on the submittal and to review their planned schedule of construction activities; particularly FY 84 activities. Among the items that they identified as needing early review was the proposed haul road crossing of Cottonwood Creek on the mill site. Also by letter dated September 22, 1983, TVA submitted information on their plans to provide additional internal drainage trenches in Ponds 1, 3, 7, and 8 and to conduct a field scale trial of their proposed placement method of wastes in the disposal impoundment. They indicated that they also desired an early review of these activities since they planned to perform all three in the fall of 1983.

TVA desires to construct the proposed Cottonwood Creek crossing as soon as possible since the present crossing is only a temporary structure and is considered to be unsafe for heavy equipment. The excavation of drainage trenches is planned to collect surface runoff from the ponds and to relieve saturated conditions in the slimes in the ponds to the maximum extent possible. Early approval of this proposal will maximize the time the slimes are allowed to drain before they are removed to the disposal site. In conjunction with the drainage trenches construction, TVA

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proposes to conduct a field scale trial of the procedures for placement of the slimes and sands in the disposal site. The material for the trial would come from that excavated from the drainage trenches.

The conceptual design of the haul road both on the mill site and from the mill site to the disposal site, was discussed in the Final Environmental Statement (FES, NUREG-0846) in Section 2.2.2.2. Also, in Section 2.2.2.5, the cleanup in and around the Cottonwood Creek channel is discussed. Design of the haul road crossing of Cottonwood Creek was not specifically discussed. However, it was recognized that a creek crossing would be necessary to remove contaminated material from the west side of the creek.

Similarly, disposal of tailings and contaminated material is discussed in Section 2.2.2.4 of the FES. These discussions address removal and disposal of the slimes from Pond 1, 3, 7, and 8. In the FES, it was contemplated that the slimes would be mixed with tailings sands and transported to the disposal site by truck. Subsequent to the FES, however, TVA has concluded that the mixing is not feasible due to the difficulty of properly mixing the sands and slimes. Therefore, they have proposed another method where slimes will be dewatered, transported by truck and covered by sands, which are then compacted. The proposed field scale trial is to determine if this method is feasible and can obtain acceptable stability.

Discussion

1. Cottonwood Creek Crossing

The proposed crossing is based on geotechnical field and laboratory investigations carried out by a consulting firm to TVA. In addition, the hydraulic design is based on flood studies of both Cottonwood Creek and the Cheyenne River. Contaminated material in the creek banks will be excavated and replaced with uncontaminated material free from any organic content. Finish side slopes of the fill will be 2 horizontal to 1 vertical. The fill will also be constructed of uncontaminated material. The creek will be relocated slightly to the west of its present location. This is being done so the crossing can be constructed and then the creek diverted to it. Flow would be through 2 structural plate pipe arches that are 16 feet 7 inches by 10 feet 11 inches in cross section and 120 feet long. The upstream (south) face of the crossing fill would be riprapped with 12-inch stone, over a 10 foot-horizontal thickness of

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clay cover, keyed 2 feet into the weathered shale under the stream bed. Filter fabric would be placed between the clay cover and the road fill. The roadway surface would be crushed gravel, 44 feet wide. Details of the design are shown on Figure 6 of TVA's September 19, 1983 submittal. The crossing is designed to pass a 1:10 year flood with 18 inches of freeboard. For events greater than about a 1:13 year flood, the crossing will act as a weir with flood waters overtopping the roadway.

2. Pond Drainage Trenches

To provide additional internal drainage of the saturated slimes in Ponds 1, 3, 7, and 8, TVA proposes to excavate drainage trenches in the slimes adjacent to the pond dikes. The trenches are planned to serve as sumps to collect surface runoff and as internal drains to relieve saturated conditions in the slimes to the maximum extent possible. Excavation would be to the bottom of the ponds and graded to allow drainage to collection sumps. Collected water would be pumped to Pond 10 for controlled storage and evaporation. It is estimated that approximately 7500 cubic yards of sands and 4000 cubic yards of slimes would be excavated. The materials would be used in the field scale material placement trial, with the excess being placed in the ponds.

3. Field Scale Material Placement Trial

TVA proposes to conduct a field-scale trial of the procedures they plan to use to place wastes in the disposal site. The original scheme envisioned in the FES was to field mix tailing sands with slimes in the ponds and to transport this mixture by truck. However, repeated attempts to get a homogeneous mix during a field trial failed. TVA is thus proposing a layered concept of placement. Slimes would be end-dumped and allowed to dry for 10 days. Sand tailings would then be placed on top of the slimes and mechanically compacted to form a stable base. The procedure would be repeated in lifts. The purposes of the trial are to determine the overall feasibility, test various compaction scenarios, determine the need for restricting sand dikes around the slimes (to avoid flowage of the slimes when sand lifts are compacted), test various dust suppressant treatments on the exterior of sand dikes, and to evaluate trafficability.

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Conclusions and Recommendations

Based on discussions held with the licensee on September 22, 1983, the NRC staff determined that radiation protection procedures developed for use during construction of the diversion channel were applicable to the three similar activities discussed here. The procedures were determined to be consistent with License Condition No. 26 and in conformance with applicable NRC requirements. A detailed review of the radiation protection procedures is contained in the Memorandum to File dated August 22, 1983.

1. Cottonwood Creek Crossing

I have reviewed the designs proposed by TVA and have concluded that the construction of the crossing will not result in any significant environmental impacts that have not previously been addressed in the FES. Although the design flow selected is relatively small, (a 10-year flood with 18 inches of freeboard), there would be no significant impact from its failure should the design flow be exceeded. For flood events that overtop the crossing, the crossing would probably act like a broad crested weir for sometime before failure of the embankment would occur. Failure would probably not be sudden and, therefore, there would probably be no significant increase in peak discharge downstream of the crossing. The choice of design flow, in actuality, becomes an economic decision based on weighing replacement costs against initial cost of designing for a larger flood. TVA has elected to design for a 10-year flood with the possibility of having to replace the embankment during the life of the project.

2. Pond Drainage Trenches

Construction of internal drainage trenches in Ponds 1, 3, 7, and 8, should help promote draining and drying of the slimes. Even if only partly successful, this should help in the handling of the slimes and in the long-term stability of the disposal. Stability of the disposal site and dewatering of the slimes to maximum extent possible is discussed in the FES and, therefore, I conclude that there will be no significant environmental impacts that have not previously been addressed. However, TVA's proposal to collect the water and transfer it to Pond No. 10 cannot be approved at this time because the proposed modifications to Pond No. 10 have not been reviewed and approved. Collected water will have to remain in the sumps until that review is complete.

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3. Field Scale Material Placement Trial

I conclude that the proposed trial will not cause significant environmental impacts that have not been addressed in the FES. The FES recommended that field scale tests of placement procedures be made prior to actual placement at the disposal site. Although this trial is somewhat different than contemplated in the FES, the environmental impacts will be similar. In addition, if the procedure is not tested prior to it being attempted at the disposal site, there is a possibility that the decommissioning could be delayed if the procedure failed.

I therefore recommend that a license condition be added to the existing license which requires TVA to implement these proposals. I recommend that License Condition No. 30 be added as follows:

30. Notwithstanding any conflicting requirements of License Condition No. 10, the licensee is authorized to construct the haul road crossing for Cottonwood Creek on the mill site, provided the design is as specified in the licensee's submittal dated September 19, 1983, the internal drainage trenches for Ponds 1, 3, 7, and 8, provided the design is as specified in the licensee's submittal dated September 22, 1983, and is authorized to perform the field scale material placement trial, provided the trial is as described in the licensee's submittal dated September 22, 1983. No water that accumulates in the internal drainage trenches shall be transferred to any other location either on or off the mill site. Notwithstanding the requirements of License Condition No. 26 regarding the submittal of a detailed radiation protection plan, the licensee shall implement the radiation safety procedures and monitoring for these activities as outlined in the licensee's submittal dated July 21, 1983.

/s/

Edward F. Hawkins, Project Manager
Licensing Branch 1
Uranium Recovery Field Office
Region IV

Approved by: /s/

John J. Linehan, Chief
Licensing Branch 1
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