

Division of United Nuclear Corporation PO. Box 3951 A UTC RESOURCES Company Albuquerque.

P.O. Box 3951 Albuquerque, New Mexico 87190 4801 Indian School Road, N.E. Albuquerque, New Mexico 87110

Telephone 505/265-4421

January 30, 1980

Mr. Cubia Clayton Bureau Chief NEW MEXICO ENVIRONMENTAL IMPROVEMENT DIVISION P. O. Box 968 Santa Fe, New Mexico 87503

> RE: Radioactive Material Science No. NM-UNC-ML (United Nuclear Corporation -Church Rock Mill)

Dear Mr. Clayton:

UNC Mining and Milling submits herewith its conceptual proposal for tailings disposal at the Church Rock Mill. The proposal sets forth the general programs which UNC Mining and Milling believes should be completed to select a particular site and implement its usage. Also enclosed are the following reports which are related to the proposal:

- Pace Company: Site Evaluation Study for Disposal of Uranium Mill Tailings
- b. Jacobs Engineering Group, Inc.: Water Balance Study for United Nuclear Corporation, Church Rock Uranium Mill
- c. Pace Company: Economics of Uranium Mill Tailings Burial Using a Dragline

Should the conceptual proposal appear to be generally acceptable to the Environmental Improvement Division, UNC Mining and Milling will implement the appropriate steps to accomplish the proposal.

Sincerely yours,

An.Hell Thomas M. Hill

Director, Tailings Management

TMH:jb

Enclosures 9804020170 800130 PDR ADOCK 04008907 C PDR

CONCEPTUAL PROPOSAL

FOR

MILL TAILINGS MANAGEMENT

CHURCH ROCK MILL

UNC MINING AND MILLING DIVISION

JANUARY, 1980

TC C

The Director of the Environmental Improvement Division's Order of October 31, 1979, relating to the UNC Church Rock Mill radioactive material license (No. NM-UNC-ML) provides, in part:

"The company shall undertake a study of alternative sites, including sites which do not rely upon the existing dam structure, for long-term disposal of tailings solution and solids in accordance with a letter dated October (29, 1979, from Mr. D. D. Turberville, UNC Mining and Milling, to Mr. John R. Martin, NRC."

UNC Mining and Milling has had several studies prepared on this subject. These studies are all related, and have led to a tentative proposal for disposal of tailings at the Church Rock facility. UNC Mining and Milling is committed to the concept of alternative site tailings deposition, to assure a continuous mill operation compatible with the surrounding environmental and reclamation requirements.

The Pace Company prepared a Site Evaluation Study for Disposal of Uranium Mill Tailings which considered a number of sites within a six mile radius of the mill. This study evaluated thirteen conceivable sites on the basis of thirteen environmental considerations. The evaluated considerations

¹ The letter referred to relates to the period of time NRC asserted concurrent jurisdiction. A recent statement by NRC provides in part: "Direct NRC regulatory authority over tailings in Agreement States was subsequently removed by an Act of Congress amending the Uranium Mill Tailings Radiation Control Act of 1978...and the NRC order can no longer be enforced." A copy of this report will be provided for NRC review.

included resistance to erosion, strata permeability, remoteness from groundwater, remoteness from population, and distance from mill.² Each site studied was ranked on a scale of 1 to 10 as to desirability and that rating was multiplied by a weighted factor assigned to each environmental factor considered. The total score provides a relative measure of site environmental desirability.

To reduce bias, <u>land</u> ownership was not considered in the rating system. A separate economic rating was made, but was not combined with the environmental site ranking.

UNC Mining and Milling considers the Pace site study an important phase of the evaluation. The study criteria assumed that the existing facility would not be used as part of the tailings disposal system. Because of this factor, the Pace study could consider only relatively large sites, because a new evaporation pond would necessarily be involved as a result of the assumptions in the study. This eliminated considerations of several sites which would be desirable except for the area needed for a new evaporation pond.

Use of the existing tailings area as an evaporation pond would allow the use of these smaller sites.

UNC Mining and Milling believes the participants in the Pace siting study were diligent and resourceful in arriving

-2-

Distance from mill was considered an environmental consideration as well as an economic factor because of possible accidents in the means of transporting tailings from the mill. Increased distance will also increase the area disturbed, and the area subject to reclamation.

at weighting factors for environmental considerations. This system does result in preliminary evaluations, which must be tested by further study. There are some limitations to this approach. For example, remoteness from habitation was given a weighted factor of 7. The thirteen sites rated from 2 to 10 in this factor, resulting in scores ranging from 14 to 70. Remoteness from populations is a desirable feature for a' tailings area, and both State and Federal existing and proposed regulations reflect the importance of this factor. However, in a general sense all of the sites within six miles from the mill are remote from population centers, and from this perspective, the range of ratings from 2 to 10 is perhaps too wide. Because the sites are generally remote from population centers, such as Gallup, Pace considered remoteness from individual residences, which are scattered in the area. The complexity of the system was illustrated by an example where a site upon which a number of residences were located received a higher ranking than one with virtually none, because of the justifiable assumption that all the residences would be required to be purchased and removed before the populated site could be used at all.

The Pace site study based its evaluations primarily upon the criteria provided in the existing and proposed radiation regulations of the New Mexico Environmental Improvement Board, the regulations of the New Mexico Water Quality Control Commission, and the proposed NRC regulations resulting from the Generic Environmental Impact Statement. The Pace site

-3-

study is submitted herewith and demonstrates that environmentally feasible sites for tailings disposal exist in the area. A great deal of testing and additional study will be required to select a particular site.

Pace and its parent, Jacobs Engineering, prepared preliminary studies on processes that might allow a greater degree of re-cycling of liquids discharged to tailings. (Wate Balance Study for United Nuclear Corporation, December 21, 1979). This report is submitted herewith. This report identified processes and very preliminary cost estimates of processes offering the most promise of practical application without interferring with the milling process. This approach is considered advantageous for several reasons, including the following:

- Reduction of liquid discharge will reduce possible contamination of ground and surface waters by seepage
- Reduction of liquid discharge will reduce the possibility and extent of contamination which would result from the failure of a containment structure or pipe
- Reduction of liquid discharge would reduce the area needed for evaporation ponds. Not only would less land be needed, but by reducing size, smaller sites which are otherwise the most desirable might be used

-4-

Reduction of liquid discharge would conserve water resources

1/0

what are the At the present time, UNC Mining and Milling is applying ammonia treatment for water management. This treatment system is working, and has reduced liquid discharge more than fifty percent (50%). If for any reason, problems develop with this treatment method, a lime treatment system appears feasible as a backup method which can be employed. UNC Mining and Milling considers the reduction of liquid discharge a very important matter in tailings disposal, and is committed to continue a program of water treatment.

The Pace Company also prepared a study of the Economics of Uranium Mill Tailings Burial Using A Dragline. This study was performed on an order of magnitude basis. The study was considered particularly useful in connection with sub-grade disposal systems. The study is enclosed.

The future tailings management system will consist of the following steps:

1. Use of the present site on an interim basis until an alternative site is permitted and constructed. This will take 2.5 to 4 years. Current estimates indicate the system could be operated up to four years in the northern half of the tailings area provided the northern dams are allowed to raise to at least 6980 feet and tailings are placed in the mine. A further lift may be necessary in the

-5-

northern area depending on success of water treatment and disposal of dry tailings.

 An engineering evaluation of operational procedures at the present site to determine the feasibility of continued use of the present site for evaporation and water treatment.

UNC Mining and Milling and Science Applications, Inc. feel this approach is the most desirable at Church Rock from both an environmental and economic approach. A detailed understanding of the geological conditions and land ownership patterns in the area strongly favor this approach as does review of the submitted studies. Further, this approach will probably allow solid disposal outside the existing structure in the shortest period of time.

Factors favoring this approach include the following:

a. The use of the existing tailings area for evaporation and recycling will allow the acquisition of relatively small sites for solid disposal as discussed below. This will allow the best sites, or best parts-of. sites to be selected. In addition, because of the ownership patterns in the area, the acquisition of a large site will, at best, be a very slow process, and will require the use of the existing structure for solid disposal for a longer period of time.

-6-

- The use of relatively small sub-grade trenches will allow disposal in the best sites for long term protection, such as in Mancos shale. The liquid can be transported from the trenches to the existing structure for evaporation, reducing seepage possibilities at the solid disposal areas.
- c. The use of relatively small sub-grade trenches for solid disposal will reduce the possibility of failure of the existing structure.
- d. Use of relatively small trenches for subgrade disposal will allow reclamation to closely follow deposition. This will minimize release of radon gas, blowing tailings, risk of unanticipated catastrophe before reclamation, and will provide monitoring experience during the mill life which will reduce the possibility of problems arising after operations have ceased.
- e. The use of relatively small trenches for sub-grade disposal will allow the maximum flexibility in picking sites for long term protection. For example, while a three hundred acre site may have some areas likely to be subject to erosion, by picking a smaller portion of the site, the areas

-7-

subject to erosion can be eliminated.

- f. Use of the existing structure as the long term evaporation area will reduce the total number of acres which might be subject to contamination. Duplication of embankment structure cost can be eliminated. Less reclamation material. will be needed.
- 3. Evaluation of alternative sites and selection of a site for solid tailings placement emphasizing the need for below grade or modified below grade disposal is a continuous program within the above time frame.
- Development of a task-specific time schedule for the entire tailings management system by March 15, 1980.
- 5. Submit a Ground Water Discharge Plan for the present site as part of the permitting procedure for the entire system including the new site. It is exceedingly difficult to develop this plan until the entire system is designed. At the present time, a submitted Discharge Plan could not address the processes to be used for total tailings management and reclamation and thus would not be accurate.
- Complete the seepage control system as per schedule shown in the January 14, 1980 letter from Henderson (UNC) to Stewart (EID). This is to be accomplished by May 1, 1980.

-8-

- By May 1, 1980, complete a study of the site with respect to PMF effects and indicate engineering to protect the site if necessary.
- 8. As part of the Discharge Plan for the present site, a detailed reclamation plan will be presented which takes into account the final proposed use of the site after integration with the new site. During the interim time period, the site is heavily monitored. Interim use, in itself, will not cause inadequacies in the reclamation plan.
- 9. Develop as part of item 4, a task-specific time schedule addressing all ancillary orders and requests from government agencies relating to tailings management.

We believe the above program will yield an environmentally protective tailings system that has not been designed under crisis conditions and has proceeded as rapidly as possible.