APPENDIX C

OUTLINE RECOMMENDED BY THE U.S. NUCLEAR REGULATORY COMMISSION STAFF FOR PREPARING SITE-SPECIFIC FACILITY RECLAMATION AND STABILIZATION COST ESTIMATES FOR REVIEW

As required by Criteria 9 and 10 of 10 CFR Part 40, Appendix A, the licensee shall supply sufficient information for the U.S. Nuclear Regulatory Commission (NRC) to verify that the amount of coverage provided by the financial assurance will permit the completion of all decontamination, decommissioning, and reclamation of sites, structures, and equipment used in conjunction with byproduct material. Cost estimates for the following items (where applicable) should be submitted to NRC with the initial license application or reclamation plan, and should be updated annually as specified in the license. Cost estimates must be calculated on the basis of completion of all activities by a third party. Unit costs, calculations, references, assumptions, equipment and operator efficiencies, *et cetera*, must be provided. The annual surety estimate must be prospective of all work to be performed at the site. The licensee must provide estimated costs for all decommissioning, reclamation, and ground-water cleanup work remaining to be performed at the site, not simply deduct the cost of work already performed from the previous surety estimate [see NRC Generic Letter 97-03 (NRC, 1997)]. The licensee can propose to deduct for work done and approved by NRC as meeting specifications.

The detailed cost information necessary to verify the cost estimates for the preceding categories of closure work is summarized in the recommended outline that follows. For each area, estimates should the include costs for equipment; materials; labor and overhead; licenses, permits, and miscellaneous site-specific costs; and any other activity or resource that will require expenditure of funds.

(I) Facility Decommissioning

This includes dismantling and decontamination, or disposal of all structures and equipment. This work may be done in two phases. In the first phase, only the equipment not used for ground-water cleanup (including the stability monitoring period) is removed. Removal of the remaining equipment would be performed in a second phase, after the approved completion of ground-water cleanup. The buildings may be decontaminated and released for unrestricted use.

(A) Salvageable building and equipment decontamination. For each building or piece of equipment listed, the following data should be provided:

(1) Area of contamination

(2) Survey costs

(3) Decontamination costs

(B) Non-salvageable building and equipment demolition and disposal:

(1) List of major categories of building and equipment to be disposed of and their corresponding quantities:

(a) Structures (list each major), metric tons [tons(short)] of material, and building volume cubic meters (cubic yards)

(b) Foundation concrete [cubic meters (cubic yards)]

(c) Process equipment [metric tons (tons (short)]

(d) Piping and insulation (lump sum)

(e) Electrical and instrumentation (lump sum)

(2) Disposal of chemical solutions within the facility.

(C) Cleanup of contaminated areas (ore storage pad, access roads, process area, evaporation pond residues, etc.).

Reclamation—This entails recontouring the tailings disposal cell and evaporation ponds and placing top soil or other materials acceptable to NRC. Reclamation may also include cleanup of windblown materials and revegetation, including:

(1) Cleanup of windblown materials (e.g., volume and area, unit cost/cubic yard).

(2) Placement of borrow materials removal (e.g., rental rate, cost/cubic yard).

(3) Dust suppression and site maintenance.

(4) Monitoring and testing of construction.

(5) Regrading.

(6) Placement of the frost barrier.

(7) Placement of the radon barrier.

(8) Installation of erosion protection and armor.

(9) Installation of any vegetative cover.

(10) Design and construction of drainage ditches.

(11) Recontouring of land surfaces.

(12) Revegetation.

(II) Ground-Water Cleanup and Well Decommissioning

Ground-water cleanup is done in accordance with an approved corrective action plan. The costs include water treatment equipment, operation, maintenance, and component replacement.

(A) Method of cleanup

(B) Volume of aquifer required to be restored, area and thickness of aquifer, number of required pumping cycles, and cycling time

(C) Verification sample analysis

(D) Well decommissioning:

(1) Number of drill holes to be plugged

(2) Depth and size of each drill hole

(3) Material to be used for plugging including acquisition, transportation, and plugging

(III) Radiological Survey and Monitoring

Radiological Survey—Surveys and soil samples for radium in areas to be released for restricted use. Soils around the tailings disposal cell, evaporation ponds, and process buildings should be analyzed for radium content. A gamma survey of all areas should be made before release for unrestricted use. All equipment released for unrestricted use should be surveyed and records maintained.

(A) Soil samples for radium (and uranium and thorium, if needed) (e.g., number, cost to collect, and analyze)

(B) Decommissioning equipment and building smear samples and alpha surface surveys

(C) Gamma survey frequency, location, and techniques (e.g., type, number, unit cost)

(D) Environmental monitoring

(E) Personnel monitoring

(IV) Project Management Costs and Miscellaneous

Itemize estimated costs associated with project management; engineering design, review, and change; mobilization; legal expenses; power during reclamation; quality control; radiological safety; and any costs not included in other estimation categories. costs should include preparation of completion report and license termination activities.

Potential needs for future well maintenance or replacement are identified. If periodic well replacement is projected, an increase in the long-term care payment is included (American Society for Testing and Materials Standard D 5978).

(V) Labor and Equipment Overhead, Contractor Profit

Overhead costs for labor and equipment and contractor profit may be calculated as separate items or loaded into hourly rates. If included in hourly rates, the unit costs must identify the percentages applied for each area.

(VI) Long-term Surveillance Fee

The fee required by 10 CFR Part 40, Appendix A, Criterion 10, to include cost of any required long-term monitoring (e.g., ground water) or maintenance (e.g., fences, vegetation control).

(VII) Contingency

The licensee should add a contingency amount to the total cost estimate for the final site closure. The staff currently considers a 15 percent contingency to be an acceptable minimum amount.

(VIII) Adjustments to Surety Amounts

The licensee is required by 10 CFR Part 40, Appendix A, Criterion 9, to adjust cost estimates annually to account for inflation and changes in reclamation plans. The submittal should be in the form of a request for amendment to the license.

(A) Adjustments for inflation: The licensee should submit a revised surety incorporating adjustments to the cost estimates for inflation 90 days before each anniversary of the date on which the first reclamation plan and cost estimate was approved. The adjustment should be made using the inflation rule indicated by the change in the Urban Consumer Price Index published by the U.S. Department of Labor, Bureau of Labor Statistics.

(B) Changes in Plans:

(1) Changes in the process, such as size or method of operation.

(2) Licensee-initiated changes in reclamation plans or reclamation/ decommissioning activities performed.

(3) Adjustments to reclamation plans required by NRC.

(4) Proposed revisions to reclamation plans must be thoroughly documented and cost estimates and the basis for cost estimates must be detailed for NRC review and approval.

To avoid unnecessary duplication and expense, NRC shall take into account surety arrangements required by other federal agencies, state agencies, or other local governing bodies. However, the Commission is not required to accept such sureties if they are not sufficient. Similarly, no reduction to surety amounts established with other agencies shall be effected without NRC approval. Copies of all correspondence relating to the surety between the licensee and the state should be submitted to NRC. If authorized by NRC to maintain a surety with the state as the beneficiary, it is the responsibility of the licensee to give NRC verification of that surety; ensure that the agreement with the State specifically identifies the financial surety's application, uranium mill tailings site, and decommissioning/reclamation requirements; and transfer the long-term surveillance and control fee to the U.S. Department of the Treasury before license termination.

All costs (unit and total) are to be estimated on the basis of third party independent contractor costs (include overhead and profit in unit costs or as a percentage of the total). Equipment owned by the licensee and the availability of licensee staff should not be considered in the estimate to reduce cost calculations. All costs should be based on current-year dollars. Credit for salvage value is generally not acceptable on the estimated costs.

NRC staff review may include a comparison of unit cost estimates with standard construction cost guides (e.g., R.S. Means, Dodge Guide, Data Quest) and discussions with appropriate state or local authorities (e.g., highway cost construction). The licensee should provide supporting information or the basis for selection of the unit cost figures used in estimates. The staff may elect to use a publicly available computer code such as RACER™ (Talisman Partners, Ltd., 2000) or spreadsheet to assess these costs.

References:

American Society for Testing and Materials Standards

D 5978, "Standard Guide for Maintenance and Rehabilitation of Ground-water Monitoring Wells."

NRC. "Annual Financial Surety Update Requirements for Uranium Recovery Licensees." Generic Letter 97-03. Washington, DC: NRC. July 1997.

Talisman Partners, Ltd. "Introduction to RACER 2000™ (Version 2.1.0)—A Quick Reference." Englewood, Colorado: Talisman Partners, Ltd. 2000.