UNITED STATES

NUCLEAR REGULATORY COMMISSION

REGION IV

URANIUM RECOVERY FIELD OFFICE
BOX 25325
DENVER, COLORADO 80225

MAR 25 1994

URFO:ROG
Docket No. 40-8905
SUA-1473, Amendment No. 29
04008905870E
X61242

MEMORANDUM FOR: Docket File No. 40-8905

FROM: Raymond O. Gonzales, Project Manager

SUBJECT: PROPOSED AMENDMENT TO SOURCE MATERIAL LICENSE SUA-1473 TO REVISE THE APPROVED RECLAMATION AND CLOSURE PLAN FOR QUIVIRA MINING COMPANY'S AMBROSIA LAKE MILL DISPOSAL AREA NEAR GRANTS, NEW MEXICO

BACKGROUND

The reclamation and closure plan for Quivira Mining Company's (QMC's) Ambrosia Lake Mill was approved on September 24, 1990, by Amendment No. 18 to Source Material License SUA-1473. Subsequently, in a submittal dated January 7, 1994, QMC requested an amendment to the erosion protection design of the approved reclamation plan.

DISCUSSION

In the January 7, 1994, submittal, QMC proposes to change the rock source to be used for obtaining erosion protection materials. The approved rock is dense basalt from La Chuchilla Ridge. License Condition No. 37(J) requires that if a rock source is selected other than the La Chuchilla Ridge source, the licensee shall submit the results of durability testing for NRC review and approval. To avoid having to develop a quarry at La Chuchilla Ridge, QMC proposes to obtain rock from a quarry that is presently being developed near the Homestake Uranium Mill. QMC refers to this new rock source as the Homestake Quarry. Rock durability testing results for this new source show that the rock is of high quality having an average specific gravity of 2.75 and scoring over 83 when evaluated using the NRC criteria discussed in the "Final Staff Technical Position, Design of Erosion Protection Covers for Stabilization of Uranium Mill Tailings Sites," Division of Low-Level Waste Management and Decommissioning, August 1990. As the proposed modification changes only the rock source and not the rock quality criteria already approved, it is concluded that the Homestake Quarry is an acceptable source for erosion protection materials.

Tailings Ponds 1 and 2 will be reclaimed in place. Under the approved reclamation plan, the tops of both ponds have stable slopes that do not require rock for erosion protection. QMC requests the option of either reclaiming the tops of Ponds 1 and 2 as approved or to place rock on the tops of both ponds. No other changes are proposed, and the pile top slopes will remain as approved. Since the pile top slopes are stable without riprap, it is concluded that placing rock will be an improvement in the erosion protection design. Therefore, this proposed design change is acceptable.

QMC also proposes to revise the gradation requirements for the approved rock having a minimum median stone diameter (D_{50}) of 1.0 inch. License Condition No. 37(K) requires, in part, that the gradation for the rock having a D_{50} of 1.0 inch be within the following gradation specification:

Sieve Size	Percent Passing (by weight)
2 inch	100
1 inch	16-50
¾ inch	2-30
½ inch	0-10

In order to reduce the amount of rock that would be rejected at the crusher, the licensee proposes to revise the gradation requirement to the following:

Sieve Size	Percent Passing (by weight)
3 inch	100
2 inch	70-100
1 inch	25-55
⅜ inch	15-40
½ inch	0-25

To verify the adequacy of this proposed riprap gradation, an independent evaluation was made using design methods presented in "Methodologies for Evaluating Long-Term Stabilization Designs of Uranium Mill Tailings Impoundments," U.S. Nuclear Regulatory Commission, NUREG/CR-4620, June 1986. This evaluation indicated that the gradation proposed by the licensee for the rock having a D_{50} of 1 inch is acceptable.

The last proposal made by QMC in the January 7, 1994, submittal is to use larger rock than required on the embankment outslopes. Under the approved reclamation plan, the D_{50} of the rock to be placed on the embankment outslope of Pond 1 will be as follows:

Horizontal distance from crest of embankment outslope (ft)	Median stone diameter (in) (D_{50})
0-150	1.0
150-270	2.0
270-420	2.8
420-toe of slope	3.2

QMC proposes to use rock having a D_{50} of 3.2 inches in areas requiring 2-inch and 2.8-inch rock. This proposed revision would allow QMC to utilize fewer rock gradation sizes while maintaining long-term erosion protection. The resulting requirement would be as follows:

Horizontal distance from crest of embankment outslope (ft)	Median stone diameter (in) (D_{50})
0-150	1.0
150-420	3.2

As this modification uses larger rock than required, it is concluded that the proposal to use rock having a D_{50} of 3.2 inches in areas requiring 2.0-inch and 2.8-inch D_{50} rock, is acceptable.

In addition to the revisions requested by the licensee, the staff noted that License Condition No. 4 indicates that the license expired in 1976. The licensee submitted a renewal application to the State of New Mexico and was placed in a timely renewal status prior to the transfer of regulatory authority from the State to the NRC in 1986. The license currently does not authorize operations at the site. The staff therefore recommends that License Condition No. 4 be revised to be consistent with the corresponding conditions for other sites not in operation by stating that the license shall remain in effect until terminated by the NRC.

In accordance with the categorical exclusion contained in paragraph (c)(11) of 10 CFR 51.22, an environmental assessment is not required for this licensing action. That paragraph states that the categorical exclusion applies to the issuance of amendments to licenses for uranium mills provided that (1) there is no significant change in the types or significant increase in the amounts of any effluent that may be released offsite, (2) there is no significant increase in individual or cumulative occupational radiation exposure, (3) there is no significant construction impact, and (4) there is no significant increase in the potential for or consequences from radiological accidents.

The licensing action discussed in this memorandum meets these criteria as the proposed amendment involves only minor changes to the erosion protection design of the site. An environmental report is not required from the licensee since the amendment does not meet the criteria of 10 CFR 51.60 (b)(2).

It is therefore recommended that Source Material License SUA-1473 be amended by revising License Condition Nos. 4 and 37 to read as follows:

4. Until terminated
[Applicable Amendments: 29]

37. The licensee shall reclaim the disposal area as stated in the September 24, 1990, and January 7, 1994, submittals as supplemented by the following conditions. Though recognized as conservative, these conditions were assumed when evaluating the acceptability of the reclamation plan as submitted, and are identified pending submittal of acceptable design alternatives. Justification for any design alternatives must be submitted for NRC review and approval prior to implementation.

A. The radon barrier shall be constructed as specified in the licensee's September 28, 1990, submittal. Prior to placement of any material onto the interim cover, the procedure defined in the licensee's October 4, 1990, submittal for establishing the integrity of the in-place material must be performed.

B. DELETED by Amendment No. 19.

C. The relocated contaminated material shall be placed in lifts not to exceed 12 inches and compacted to at least 90 percent of the maximum standard dry density after a stable work base has been established.

D. In place density and moisture, laboratory compaction, soil classification, and rock quality testing shall be performed in accordance with the licensee's September 24, 1990, submittal. If test procedures other than the sand cone test or oven dry moisture are used in the construction quality control, procedures that will be used to establish correlation between the tests must be submitted for NRC review and approval prior to implementation.

E. A detailed cover design for Ponds 11-21 must be submitted for NRC review and approval. All contaminated materials in Pond 3 that are not covered by the reclaimed Pond 1 outslope shall be relocated to Pond 2 unless an erosion protection plan is submitted for NRC review and approval.

F. The settlement survey data shall be submitted for NRC review and approval prior to placement of the radon barrier on the interim cover.

G. The fresh water dam (mill reservoir) must be breached during final reclamation activities.

H. Settlement monuments shall consist of a steel bar welded to a 1-foot square steel plate, or equivalent, placed at least 3 feet below the surface.

I. The fill associated with the Pond 1 spillway shall be constructed to the same specifications and quality control program as the radon barrier material.

J. If a rock source other than the Homestake Quarry is selected, the licensee shall submit the results of durability tests as outlined in the Final Staff Technical Position on Design of Erosion Protection, August 1990, for NRC review and approval prior to placement of any of the material.

K. All riprap shall be placed in a manner that prevents segregation of the material. The material placed shall be reasonably well graded and shall be within the following gradation specifications.

D_{50} = 1.0"

Sieve Size	Percent Passing (by weight)
3 inch	100
2 inch	70-100
1 inch	25-55
¾ inch	15-40
½ inch	0-25

D_{50} = 3.2"

Sieve Size	Percent Passing (by weight)
6 inch	100
5 inch	78-100
4 inch	35-100
3 inch	12-45
2 inch	0-20

D_{50} = 7.7"

Sieve Size	Percent Passing (by weight)
13 inch	100
12 inch	80-100
10 inch	49-100
8 inch	26-54
6 inch	7-32
4 inch	0-13

L. A minimum 6-inch bedding layer with a D_{50} of 1 inch shall be placed under all riprap on the disposal area having a D_{50} of 2 inches or larger.

The bedding material shall be reasonably well graded to prevent migration of the base material into the riprap. The quality of the bedding material shall be equivalent to that of the riprap.

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M. A riprap filled toe trench shall be placed on the west side of Pond 2 where the existing steep slopes transition onto the flatter surface of Pond 2.

The licensee shall submit a proposed design of the trench for NRC review and approval prior to construction.

N. The spillway riprap shall be extended 45 feet onto the top of Pond 1 to prevent erosion.

O. Riprap with a D_{50} of 1 inch shall be placed in all areas of the South Diversion Ditch which are not excavated in rock.

P. As an alternative to the erosion protection design of the top surfaces of Ponds 1 and 2, which was approved in Amendment No. 18, the licensee may use a 3-inch layer of riprap having a minimum median stone diameter (D_{50}) of 1-inch.

[Applicable Amendments: 18, 19, 29]

The proposed license conditions were discussed and agreed to by Mr. Bill Ferdinand on March 07 and 25, 1994.

Raymond O. Gonzales
Project Manager

Case Closed: 04008905870E
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bcc:
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PDR/DCS
URFO r/f
SJCollins, RIV
DBSpitzberg, RIV
RAScarano, RIV
LLUR Branch, LLWM, 5E2
PJGarcia
ROGonzales
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PM:URFO	PM:URFO	DD:URFO	D:URFO:RIV	
ROGonzales/lv	PJGarcia	EFHawkins	REHall	
03/25/94	03/25/94	03/25/94	03/25/94	