UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
URANIUM RECOVERY FIELD OFFICE
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DENVER, COLORADO 80225

MAY 12 1993

URFO:PJG
Docket No. 40-8903
X60748

MEMORANDUM FOR: Docket File No. 40-8903

FROM: Pete J. Garcia, Jr., Project Manager

SUBJECT: ENVIRONMENTAL ASSESSMENT

Attached is the environmental assessment prepared to document the staff's evaluation of alternatives for tailings reclamation and mill decommissioning at Homestake Mining Company's Grants Mill.

Pete J. Garcia Jr.

Pete J. Garcia, Jr.
Project Manager

Attachment:
As stated

Case Closed: X60748

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ENVIRONMENTAL ASSESSMENT
FOR THE DECOMMISSIONING AND RECLAMATION
OF THE GRANTS MILL AND TAILINGS PONDS
DOCKET NO. 40-8903

MAY 1993

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1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

Homestake Mining Company submitted a proposed tailings reclamation and mill decommissioning plan for the Grants Mill to the NRC for review in January 1991. This submittal was in accordance with Criterion 9 of Appendix A to 10 CFR 40, which requires that financial surety arrangements be established by each uranium mill operator to assure that sufficient funds will be available to carry out the decontamination and decommissioning of the mill and site, and for the reclamation of any tailings or waste disposal areas. Criterion 9 further states that the amount of funds to be ensured by the surety arrangements must be based on a Commission-approved plan for decommissioning of mill buildings and the milling site, and the reclamation of tailings and waste areas in accordance with technical criteria delineated in Section I of Appendix A.

The licensee submitted a supplement to their environmental report prepared in 1982, on December 8, 1992. The supplement describes the expected impacts associated with mill decommissioning and tailings reclamation, and evaluates alternatives for mitigating the impacts. Additional information regarding the site environment and environmental impacts of the proposed site closure plan was provided in letters dated January 11 and March 16, 1993.

The purpose of this environmental assessment is to evaluate alternatives for tailings reclamation and mill decommissioning. The licensee's preferred alternative calls for the decommissioning and disposal of the mill and the reclamation of the tailings ponds in place at the licensee's site. The licensee proposes to demolish the mill and dispose of the mill structure and most of the mill equipment in place, although more highly contaminated pieces of equipment will be disposed in the tailings pond. Reclamation of the tailings ponds will be performed by flattening pile outslopes to 5H:1V. Radon attenuation and erosion protection layers will be placed over both the mill disposal areas and the tailings ponds to assure that the applicable technical criteria of Section I will be met.

2.0 CHARACTERISTICS AND OPERATIONAL HISTORY OF THE MILL AND TAILINGS

Uranium milling operations at the Grants site began in 1958 and were terminated in February 1990. Two separate mills were originally located at the site. The smaller mill only operated until January 1962, after which all milling activities were conducted in the larger facility. Both mills utilized alkaline leach circuits, with a nominal capacity for the two mills of 3400 tons of ore per day.

Following extraction of the uranium, the tailings were discharged to a small or a large tailings impoundment. The small impoundment was constructed using an earthfill containment dike into which the tailings were discharged from the northwest corner. The larger impoundment was also constructed using an earthfill containment dike. The larger impoundment was raised using the centerline construction method and tailings for the construction material. The impoundment outslopes and containment dikes were formed by hydraulic placement of the coarse fraction of the tailings, while the finer fraction of the tailings and the tailings liquid were discharged into the pond.

The small impoundment contains approximately 1.8 million tons of tailings, while the large impoundment contains approximately 21 million tons. The alkaline leach circuit employed at the Grants Mill required a finer grind of the material to be leached than does an acid leach circuit. As a result, up to 60 percent of the tailings solids are finer than a No. 200 sieve used by the Unified Soil Classification System to identify fine particles.

The Homestake site is underlain by alluvial soils which range from 40 to 120 feet (12 to 36 meters) thick at the site. The alluvium trends to the southwest and contains a surficial aquifer. The alluvium is underlain by about 850 feet (255 meters) of shales and siltstones which comprise the Chinle formation. The Chinle formation acts as an effective barrier between the surficial aquifer and the underlying San Andres formation, which is the principal water-bearing formation in the vicinity of the mill.

Milling activities at the site have resulted in impacts to the surficial aquifer which underlies the Grants Mill. A ground-water corrective action program has been implemented at the site since 1977. The corrective actions include the injection of fresh water from an underlying aquifer into the surficial aquifer near the licensee's property boundary to form a hydraulic barrier to the seepage and reverse the local ground-water gradient so contaminated water can be retrieved by a series of collection wells located near the tailings impoundment. The captured water is currently being returned to a synthetically-lined evaporation pond which was constructed on the small tailings impoundment. The corrective action program appears to be successful in mitigating the negative impacts of seepage from the tailings ponds.

3.0 ENVIRONMENTAL CHARACTERISTICS OF MILL SITE

A. Geography and Demography

The Homestake Mill is located about 5.5 miles (8.8 kilometers) north of Milan, New Mexico, in Cibola County. The site is situated in the San Mateo drainage at an elevation of 6600 feet (1980 m). The site area is surrounded by mesas ranging in elevation from 7000 to 8600 feet (2100 to 2580 m). The mesas define a roughly circular valley about 10 miles (16 km) in diameter. The San Mateo drainage is an ephemeral arroyo which drains an area of approximately 291 square miles (75,369 hectares) and connects with the Rio San Jose near the town of Milan.

The adjacent cities of Grants and Milan contain the largest population in the area. The Grants Chamber of Commerce estimated the population of the Grants-Milan community in 1990 to be about 11,400. There are several subdivisions located about 0.5 mile (0.8 km) south and southwest of the site. Based on information compiled by Homestake in 1989, the subdivisions consisted of 66 residences. There are no nearby residences located north, east, or west of the facility.

The great majority of the land in the vicinity of the current millsite is undeveloped rangeland. The ARCO Bluewater uranium millsite is located approximately 5 miles west of the Homestake site. Residential areas were estimated to account for about 3 percent of the area.

The only surface water bodies in the vicinity of the site are several stock ponds and some small ephemeral ponds which are not affected by site activities. Drinking water for the Grants-Milan area is obtained from deep wells drilled into the San Andres aquifer. Domestic water for the subdivision south of the site is also obtained from the Grants-Milan system.

B. Meteorology

The Homestake site has an arid to semiarid climate with average yearly precipitation of about 10 inches (25 cm). Winds are primarily from the southwest at an average speed of about 5 miles per hour (8 km/h). Most precipitation at the site occurs in the summer, although the Grants area receives approximately 24 inches (61 cm) of snow annually.

Severe storms in the area are rare, although the site is subject to short-term, intense cloudbursts which can cause flash flooding. No tornadoes have been observed in the area, and winter snowfalls are generally not accompanied by severe winds which could cause blizzards.

C. Air Quality

No monitoring for nonradiological parameters has been performed at the site. The air quality at the site would be expected to be good however, because there are no industrial operations near the site which could affect air quality and low volumes of automobile traffic. Sampling for radiological parameters performed by the licensee indicate that emissions of airborne particulates and radon have been well below maximum permissible concentrations.

D. Ecology

Vegetation in the vicinity of the site consists primarily of grassland-desert species such as saltbush and western wheatgrass. Wildlife in the area is generally limited to small mammals and bird species. Characteristic species include desert cottontails, jack rabbits, pocket gophers, meadowlarks, and western rattlesnakes. No aquatic species are present on or near the site. Finally, no species currently listed as endangered by the Federal government or the State of New Mexico are expected in the vicinity of the site.

E. Hydrology

As discussed earlier, the Homestake Mill is situated on an alluvial system which trends to the southwest. The alluvium ranges from about 40 to 120 feet (12 to 36 m) thick under the millsite. Depths to the alluvial water table vary from about 40 to 60 feet (12 to 18 m). The Chinle formation which underlies the alluvium at the site consists of low permeability shales and acts as a barrier to vertical ground-water movement. The Chinle formation at the site is approximately 850 feet thick (255 m). The San Andres aquifer, which is the principal regional water producing source, underlies the Chinle.

Due to the very dry conditions which typically exist in the vicinity of the site, no permanent surface water features exist near the site. The San Mateo drainage as well as all streams in the area are ephemeral or intermittent.

Additional information concerning the local or regional hydrology can be found in the licensee's Environmental Report.

F. Geology

The site is located on the northeast flank of the Zuni Uplift, a tectonic feature which is characterized by Precambrian crystalline basement rocks overlain by Permian and Triassic sedimentary rocks. Major faults occur along the southwest flank of the Zuni Uplift, with only minor faults mapped in the region surrounding the site. Faults associated with the Zuni Uplift are generally northwest trending, steeply dipping reverse faults. However, the minor, steeply dipping normal and reverse faults in the vicinity of the site generally trend northeast. None of the local faults are considered to be active.

Slope gradients in the area generally range from 0 to 5 percent in valleys and mesa tops, and from 5 to over 100 percent on the flanks of the mesas and on the nearby volcanic peaks. Where the gradient is steep in the northern San Mateo drainage, intersecting arroyos are commonly incised from 10 to 30 feet (3 to 9 m). Where the gradient decreases, such as in the site vicinity, incision is minimal and flow occurs in wide, shallow, poorly defined, or practically non-existent channels.

The site is located on the Colorado Plateau, a tectonically stable block characterized by a low level of seismicity. Earthquakes which have occurred within 60 miles (96 km) of the site have typically been of low intensity.

Additional information on the geology, geomorphology, and seismicity of the site area can be found in Section B4.0 of the Environmental Report.

G. Historic and Cultural

The Homestake Mill and tailings disposal system were originally constructed in 1958. Surveys for historic and cultural resources were not performed prior to the initial disturbance. The area immediately surrounding the tailings pile has been heavily impacted by operations over the years. The extension of the embankment outslope as part of reclamation will only absorb areas which already have been heavily impacted. No impacts to historic or cultural resources are expected. Any areas not currently impacted, such as soil or rock borrow areas, will be surveyed for historical or cultural resources prior to and during disturbance.

H. Natural Radiation Environment

Background radiation monitoring has been conducted at the site under an NRC license since 1986, and prior to that was conducted under a license issued by the State of New Mexico. These data have been reported to the NRC semiannually in accordance with license requirements and 10 CFR 40.65. Baseline data exist for direct gamma radiation, radon, radiological air particulates, vegetation, soil, and ground water.

4.0 DECOMMISSIONING AND RECLAMATION PLAN DESIGN

A. Mill Decommissioning

The licensee's proposed decommissioning plan consists basically of disposal in place. Debris that can be crushed flat or with a shape that allows placement of a flat surface against a soil base will be placed with the flat side down, covered with soil, and compacted. Debris that is incompressible and contains more than 10 percent void space, or debris with shapes that prevent placement of soil against all surfaces, will be filled with a sand-cement slurry grout or placed in a pit formed in compacted soil or dug below grade which will then be filled with a sand-cement slurry grout to fill all voids. Items with the highest levels of contamination will be disposed in the tailings pond to assure greater isolation of these items.

All disposed mill debris will be covered with at least 2 feet (0.6 m) of soil. The soil layer will be compacted to at least 90 percent of the maximum dry density as determined by the standard proctor method or 80 percent relative density, whichever is appropriate. A berm will be constructed to divert rainfall runoff away from the mill disposal area, thereby assuring greater long-term stability.

B. Tailings Disposal

The licensee's preferred alternative for reclamation of the tailings ponds at the site calls for reducing embankment outslopes to 5H:1V and regrading the ponds to cover all slimes areas with sand tailings to accelerate dewatering of the slimes and achieve desired contours. Soils contaminated by site operations will be returned to the tailings ponds. A radon barrier layer will then be placed over all tailings. A diversion channel will be constructed to convey runoff from probable maximum flood storm (PMF) events off the reclaimed tailings area. The diversion channel and the embankment outslopes will be covered with a rock erosion protection layer sized to resist flows generated during a PMF event.

C. Assessment of Compliance with Appendix A to 10 CFR 40

The reclamation plan will be designed to meet the applicable technical criteria specified in Section I of Appendix A. The reclamation plan will include all areas which exceed background concentrations of radium in soil by 5 pCi/g, as required by Criterion 6. The radon barrier will

be designed to limit radon emanation from byproduct material to less than 20 pCi/ sq. meter-sec as required by Criterion 6. As stated above, all erosion protection features of the proposed reclamation plan will be designed to withstand PMF flows, thus providing assurance that the 1000-year longevity requirement of Criterion 6 is met.

Criteria 1 and 3 contain general siting and disposal objectives for uranium tailings impoundments. These objectives pertain more appropriately to the siting of new tailings retention systems. However, the objectives are discussed below with respect to the existing tailings retention system, although the system was in operation long before Appendix A was in effect. The objectives are as follows:

1. Remoteness from populated areas;

2. Natural conditions which contribute to immobilization and isolation of contaminants from ground-water sources;

3. Potential for minimizing erosion, disturbance, and dispersion by natural forces over the long term; and

4. Disposal below grade.

The current location of the tailings retention system at the Grants Mill does not meet objectives 1 and 4, as the system is located approximately 0.5 miles (0.8 km) from a residential subdivision and is situated entirely above grade. Objectives 2 and 3 are not met by natural conditions at the site, but can be achieved using engineered features. A discussion of the preferred alternative and alternate disposal methods is presented in the following section.

5.0 EVALUATION OF TAILINGS RECLAMATION ACTIONS

A. Alternative Reclamation Actions

Alternate tailings disposal sites were evaluated in detail as part of the Environmental Report submitted by Homestake to the State of New Mexico in 1982. The alternative site study included an evaluation of all potential tailings disposal sites within 7 miles (11 km) of the current site. A three-step process was used to evaluate potential disposal sites. Exclusionary criteria were first used to eliminate areas which contained major flaws. These criteria included being in a 100-year floodplain, proximity to active or potentially active faults, and proximity to residential or industrial areas.

A ranking system was then established for evaluating remaining areas. The ranking system included a total of fifteen major categories, and up to six considerations within each category. The categories and considerations were each then assigned a weighting factor based on the

relative importance of categories and of the considerations within each category. Categories included ground water, surface water, remoteness from habitation, geomorphology, ecology, cultural resources, and aesthetics.

The licensee identified nine areas which were not eliminated during the exclusionary criteria phase of the evaluation. These areas were then evaluated using five criteria judged to be the most important. These included the first four criteria listed above as well as proximity to the mill. As a result of this evaluation, two areas scored significantly higher than the remaining seven areas.

The highest ranking areas were then subdivided into nine individual sites of 0.5 to 1.5 square miles (129.5 to 388.5 hectares) primarily on the basis of physical boundaries and characteristics. These sites were evaluated using all fifteen categries. In this portion of the evaluation, three sites scored significantly higher than the other sites. The three sites are contiguous, and were therefore evaluated as one site for the purposes of the feasibility study conducted in 1989, and the alternative assessment prepared for the environmental report supplement.

The alternate site consists of 1 square mile (259 hectares) located approximately 2 miles (3.2 km) north-northwest of the current tailings impoundment. The site is located several miles from any residence or major transportation corridor. The alternative site occupies a small watershed of less than 1 square mile (259 hectares), and sits entirely above the peak elevation of a Probable Maximum Flood on San Mateo Creek which lies east of the site. The site is underlain by a thin layer of alluvial soils, followed by at least 500 feet (150 m) of the lower Chinle formation. The lower Chinle consists of low permeability claystones, mudstones, and shales. The shallowest dependable aquifer under the site is the San Andres formation, which lies at a depth of about 700 feet (210 m).

The tailings would be transferred to a below-grade disposal pit at the site either as a solid or a slurry. If transferred as a slurry, the rate of relocation would be approximately 11,200 cubic yards (8500 cubic meters) of tailings per day, 365 days per year. For a slurry of two parts water to one part solids, the slurry relocation would require about 4.5 million gallons (17 million liters) of water and a pumping rate of about 5400 gallons per minute (gpm) [20,500 liters per minute (lpm)] full-time for 2 years.

If the tailings were relocated using conventional earthwork methods, they would have to be dewatered to an unsaturated condition. If the rate of seepage of tailings liquid were to continue at the present estimated rate of 75 gpm (285 lpm), it would take approximately 9 years for the liquid to drain from the tailings. The tailings would be loaded

onto 60-cubic yard (46 cubic meter) capacity dump trucks using a front end loader. At a rate of two trips per hour per truck, 365 days per year, a total of about 22 trucks would be needed to accomplish the transfer in 2 years.

The primary advantages to relocation of the tailings to the alternate site are as follows:

1. Except for a thin layer of alluvial soils, the site is underlain by a thick layer of low permeability soils.

2. The site is not located in a major floodplain and is within a small drainage area.

3. The site is remote from residences and major transportation corridors.

4. Reclamation could be accomplished in a below-grade manner, meeting the preferred alternative of Criterion 3 of Appendix A.

The primary disadvantages of relocation of the tailings to the alternate site are as follow:

1. There is a potential for significant environmental impacts resulting from accidents such as pipeline ruptures or routine activities such as loading and unloading dry tailings on trucks.

2. There would be an unavoidable additional consumption of fuel and/or electric power due to construction and transportation activities.

3. The alternate site would be lost to possible future productive or ecological uses, while the existing site could possibly also require long-term institutional controls.

4. The relocation results in a significant increase in costs due to transportation of the tailings and extensive cleanup of contaminated soils underlying the current disposal area. This is discussed more fully in Section 5g.

The "no action" alternative was not addressed in the licensee's environmental report and will not be addressed in this assessment, because Section I of Appendix A to 10 CFR 40 requires that sites containing byproduct material be closed in accordance with a design which meets specified technical criteria. No action is therefore not a viable alternative.

B. Unavoidable Adverse Environmental Impacts

Unavoidable adverse environmental impacts resulting from reclamation of the tailings in place will include the generation of dust due to construction activities and the continued leakage of seepage of tailings

solution from the tailings pile. Water will be applied to all tailings surfaces being worked to minimize dust generation, and the ground-water corrective action program currently in effect at site will continue to be implemented until the requirements of Criterion 5 of Appendix A are met.

Relocation of the tailings to the alternate site would result in a significantly greater generation of dust due to the extensive handling of the tailings required at both the old and new sites. Also, the relocation would not have a significant impact on the ground-water corrective action program. The relocation would not accelerate the completion of the corrective action program under the trucking scenario due to the need to dewater the tailings, and would not significantly affect the completion schedule under the slurry scenario as the major aspect of the remediation program at the present is the cleanup of seepage which has previously occurred.

C. Potential Accidents

Potential accidents associated with reclamation of the tailings in their current location primarily result from earthwork construction activities such as collisions or rollovers. The potential for accidents will be minimized by performing all activities in accordance with rigid safety procedures.

The potential for accidents would be significantly increased if the tailings were to be relocated. Both relocation scenarios would involve substantially more construction activity than reclamation in place. Further, relocation by truck would require that a large number of vehicle-miles be driven, while relocation by slurry would involve potential ruptures of the transporting pipelines.

D. Irreversible and Irretrievable Commitments of Resources

Reclamation of the tailings in place would result in some irreversible and irretrievable commitments of resources. First, the reclaimed area will be placed under long-term institutional care as required by Criterion 11 of Appendix A, thus eliminating the land from any future potential uses. Second, naturally occurring soils and rocks will be excavated and used to isolate the tailings. Third, energy resources will be utilized during the construction activities.

All three types of resource commitments would also be incurred to at least the same degree if the tailings were to be relocated. Relocation would result in the loss of the new site, and possibly also the existing site if long-term institutional controls were necessary. Soils and rock would also be needed to isolate the tailings at the new site. Finally, the consumption of energy resources would be increased substantially under either relocation alternative.

E. Relationship Between Short-Term Uses of Man's Environment and the Maintenance of Long-Term Productivity

The short-term uses of the environment associated with reclamation of the tailings in place will be minimal. Impacts which resulted from construction and operation of the tailings facility have already occurred. Impacts from reclamation of the tailings in place include disturbance of borrow areas to obtain cover soils and rock, and the generation of dust and noise. The only effect reclamation in place will have on long-term productivity will be elimination of the site from any future productive use.

The relationship between short-term uses of the environment and the maintenance of long-term productivity associated with relocation of the tailings would be very similar to that described for reclamation in place.

F. Socioeconomic Impacts

Socioeconomic impacts associated with reclamation of the tailings in place consist of the generation of additional jobs for the short term. These jobs will be eliminated when reclamation activities are completed. Socioeconomic impacts associated with relocation of the tailings would be very similar.

G. Cost-Benefit Balance of Environmental Action and Alternatives

The licensee provided an evaluation of major costs associated with reclamation in place, relocation using slurry transport methods, and relocation using conventional construction methods. The costs for the various alternatives are as follows:

1. Reclamation in place - $5,701,016

2. Slurry relocation - $15,506,799

3. Conventional earthwork relocation - $44,073,789

T' costs for reclamation in place were obtained from the reclamation submitted to the NRC in January 1991. The costs for the relocation c, .ons were derived using cost estimates contained in the 1992 R. S. Means construction cost guide. All the cost estimates included comparable work activities, and did not include items such as mill decommissioning, ground-water remediation, and cleanup of windblown contamination which would be required under each of the alternatives. Only work activities directly associated with reclamation of the tailings were included in the cost estimates, which were based on the licensee performing the work. The cost evaluation did not include costs associated with design and licensing of the relocation options, which would add significantly to the estimated costs for those options.

The major benefits associated with relocation of the tailings include reclamation below grade, a better location from a surface water standpoint, and remoteness from residences and transportation corridors. Regarding the first benefit, reclamation below grade is considered the preferred alternative under Criterion 3 but is not a required alternative. Regarding the second benefit, the design of the engineered features associated with the reclamation in-place alternative will provide the long-term protection of the reclaimed tailings required by Criterion 6 of Appendix A. Regarding the third benefit, there is no guarantee that future development would not occur in the vicinity of the relocation site and long-term institutional control of the existing site should preclude any significant impact on the residences located approximately 0.5 miles (0.8 km) south of the existing site.

The licensee is required by license condition to complete placement of the radon barrier over the large tailings pile by December 31, 1996. This deadline is consistent with that specified in the Memorandum of Understanding between the NRC and the Environmental Protection Agency. The 2-year period for relocation of the tailings was chosen to allow the slurry option to possibly achieve the deadline after allowing for additional site data collection, facility design, preparation of proposal and environmental report, and regulatory review. Any operational delays would result in placement of the radon barrier after the specified date. The conventional relocation option would definitely result in placement of the barrier after the deadline. Reclamation in place would allow the deadline specified in the MOU to be met.

Based on the costs and benefits associated with the three reclamation options, the staff concludes that the additional costs of relocation outweigh the minor benefits which would result. The reclamation plan proposed by the licensee will meet all applicable technical requirements of Section I of Appendix A. The staff therefore concludes that the preferred alternative for reclamation of the Homestake tailings piles is stabilization in place.

6.0 EVALUATION OF MILL DECOMMISSIONING ACTIONS

Alternatives for decommissioning the mill were evaluated in the March 16, 1993, submittal. The licensee considered three alternatives for decommissioning the mill. These alternatives are as follows:

1. Removal of all mill facilities and burial of the debris in the tailings pond.

2. Demolition and disposal of all mill facilities in place.

3. Demolition and disposal of the majority of the mill facilities in place, with selected components buried in the tailings pond.

Alternative 1 above was initially proposed by Homestake in the original closure plan submitted to the NRC in 1986. This alternative would remove the

facilities and place the debris at the toe of the large tailings impoundment, where it would be covered by the reclamation outslope and a radon barrier. The cost for this option was estimated in 1986 as $1.5 million dollars.

Alternative 2 called for the demolition and burial of the mill in place. The burial would be accomplished either by placement of the debris at grade or within subgrade pits and covering the debris with a soil layer. Specific costs for this alternative were not evaluated because the difficulty and cost of reducing the size and shape of certain mill components to configurations needed for in place burial were considered unrealistic.

Alternative 3 was proposed in the reclamation plan submitted in 1991. Most mill debris under this alternative would be buried in place, either at grade or in below grade pits. Components that cannot be crushed or reduced in size or shape to allow effective burial in place, and components that have relatively high contamination levels would be placed in burial pits at the toe of the large tailings impoundment. The disposal area will be covered by the regraded outslope of the impoundment and the radon barrier for the tailings pile. The cost for this option was estimated in 1991 as $574,000.

Alternative 3 is the alternative preferred by the licensee. While the staff concludes that all three alternatives could satisfy the technical criteria of Appendix A, Alternative 3 does present some advantages. Cost minimization is achieved by reducing material handling costs by burying most debris in place and minimizing the amount of radon barrier material needed for the mill disposal area. However, items which are difficult to bury and the more highly contaminated items would be buried within the reclaimed tailings, which will assure greater long-term stability due to the large amounts of material which will cover the debris.

This alternative therefore minimizes costs while providing an increased assurance of long-term isolation of the more highly contaminated mill debris. The staff therefore agrees that Alternative 3 is the preferred alternative for disposal of mill debris. The licensee and the staff did not consider the "no action" alternative because Section I of Appendix A to 10 CFR 40 requires disposal of byproduct material in accordance with a design which meets specific technical criteria.

7.0 ENVIRONMENTAL MONITORING DURING DECOMMISSIONING AND RECLAMATION

A. Meteorological Monitoring

No meteorological monitoring is required under the existing license and none would be required during the reclamation phase.

B. Hydrological Monitoring

The hydrological monitoring program currently in effect at the site will continue to be implemented throughout the reclamation phase, although minor modifications to the program may be made. The existing program consists of the semiannual sampling of numerous ground-water wells. The

samples collected from the wells are analyzed for a variety of radiological and non-radiological constituents, including uranium, radium, sulfates, chlorides, selenium, molybdenum, and nitrates.

C. Ecological Monitoring

Ecological monitoring to be performed during the reclamation phase involves the annual collection of soil and vegetation samples and analysis of the samples for Radium-226. The samples will be collected in five locations, including nearest residence, background, and three downwind locations.

D. Radiological Monitoring

Radiological monitoring to be conducted will include the collection of air particulate samples and continuous monitoring of radon and external radiation levels at five locations, including nearest residence, background, and three downwind locations. The air particulate sampling will be conducted continuously, with filters changed weekly and composited quarterly for analysis. The samples will be analyzed for uranium, Radium-226, and Thorium-230.

8.0 PERMITS NEEDED FOR DECOMMISSIONING AND RECLAMATION

All activities at the Homestake site are conducted in accordance with NRC Source Material License SUA-1471. The reclamation plan as approved by the staff will be incorporated into the license. The ground-water monitoring and corrective action program is included in the NRC license and is also regulated under a Ground Water Discharge Plan issued by the New Mexico Environment Department. In addition, the Homestake site is currently listed as a Superfund site by the EPA. The NRC and EPA are in the final stages of an MOU to define agency responsibilities with respect to the Homestake site. This MOU will result in the NRC being designated as the lead regulatory agency, with EPA assuming an oversight role. Other than the license and the Discharge Plan, no other permits will be required for the reclamation plan.

9.0 CONCLUSION

The staff concludes that reclamation of the tailings in place can be accomplished in a manner that will meet all technical requirements contained in Section I of Appendix A to 10 CFR 40. Further, the staff concludes that no significant benefits would result from relocation of the tailings to an alternative site. The staff therefore agrees that the preferred alternative for reclamation of the tailings at the Homestake site is reclamation in place. The staff also agrees with the licensee's preferred alternative for decommissioning the mill. This alternative consists of dismantlement of the mill and disposal of most of the debris in place, with difficult to place items and items with higher contamination levels disposed in the tailings impoundment.

The staff also concludes that the reclamation of the tailings and the decommissioning of the mill in accordance with the licensee's preferred

alternatives will not have a significant impact on the environment. Short-term impacts to the environment will be minimal, while long-term impacts will be reduced to levels determined to be acceptable by promulgation of Appendix A to 10 CFR 40. The staff therefore concludes that, based on the findings of the environmental assessment, an environmental impact statement need not be prepared.

The staff therefore recommends that Source Material License SUA-1471 for the Grants Mill be amended to authorize tailings reclamation and mill dr ommissioning in accordance with the preferred alternatives and specific designs which meet all technical criteria contained in Criterion 6 of Appendix A to 10 CFR 40.