Attachment 1

BOKUM RESOURCES CORPORATION

P. O. Box 1833
142 W. Palace Avenue
Santa Fe, New Mexico 87501
(505) 982-1824

March 28, 1977

Mr. Russell Rhoades
Division Director
Environmental Improvement Agency
Crown Building
Santa Fe, New Mexico

Dear Mr. Rhoades:

This letter is to advise you that Bokum Resources Corporation has undertaken the planning for a uranium processing mill at its Marquez, New Mexico property. Please consider this the initial step in the filing of an application for a mill license.

The mill is expected to be an acid leach mill, with an initial capacity of approximately 2,000 tons per day.

The mill location is expected to be in Sandoval County, although the mine property itself is located in McKinley County.

The mill facility may also include an ion exchange plant, which we would expect to be part of the mill license application.

Water usage for the mill will be supplied primarily from the mine waters and related facilities.

A mine water discharge permit has been applied for with the Environmental Protection Agency, Dallas.

Would you please forward us the necessary applicati forms and guidelines.

Sincerely yours,

BOKUM RESOURCES CORPORATION

William E. Biava
Vice President

WEB:jer

BOKUM RESOURCES CORPORATION

P. O. Box 1833
142 W. Palace Avenue
Santa Fe, New Mexico 87501
(505) 982-1824

February 16, 1978

Mr. Theodore A. Wolff, Program Manager
State of New Mexico
Radiation Protection Section
P.O. Box 2348
Santa Fe, New Mexico

Dear Mr. Wolff:

Please find hand delivered to you this day ten copies of Bokum Resources Corporation's license application for our proposed Marquez Uranium Mill. Each copy of the application includes two volumes. The first volume includes the License Application, the Mill Radiation Safety Program and the Environmental Report. The second volume presents appendices referred to in the Environmental Report.

Since Bokum Resources intends to have the proposed mill operational in the first quarter of 1979, your timely action upon our application would be greatly appreciated. If you have any questions regarding this submittal please contact me.

Very truly yours,

Wm. P. Biava

Wm. P. Biava
Executive Assistant

Enclosures

cc: Patrick Donahoe

WPB:cjh

Attachment 3

STATE OF NEW MEXICO

JERRY APODACA, *Governor*
FERNANDO E.C. DE BACA, *Executive Director*
Environmental Improvement Agency

HEALTH and SOCIAL SERVICES department

OFFICE OF THE DIRECTOR

February 16, 1978

William E. Biava
Executive Assistant
Bokum Resources Corporation
P. O. Box 1833
Santa Fe, New Mexico 87501

Dear Mr. Biava:

This acknowledges receipt of your letter of February 16, 1978 to Dr. Wolff and ten copies of your application for a Radioactive Material License for operation of your proposed Marquez Uranium Mill.

Several months ago your company was provided with a copy of the Uranium Mill License Application Guidelines and the Radiation Protection Regulations. Your attention is invited to 3-310 B and C and 4-100 B of the regulations and the guidelines regarding the siting and design of a tailings management system.

A preliminary examination of your application indicates significant departures from the guidelines provided, particularly with reference to the tailings retention system design and siting. Further, the time scale disclosed in the second paragraph of your letter indicates that you anticipate construction prior to obtaining a license.

Since the Radioactive Material License is an operating license and not a construction permit, your company is at liberty, subject to other customary approvals, to begin construction of mill facilities at company risk. However, given the information that the construction may be unlicenseable, this Agency cautions that construction prior to Agency approval appears imprudent.

Please advise us if we can assist you further.

Sincerely,

THOMAS E. BACA
Director

TEB:AAT:emn

STATE OF NEW MEXICO

JERRY APODACA, *Governor*
FERNANDO E.C. DE BACA, *Executive Director*
ENVIRONMENTAL IMPROVEMENT AGENCY
P. O. Box 2348
Santa Fe, New Mexico 87503
(505) 827-5271

Director's Office

HEALTH and SOCIAL SERVICES department

March 1, 1978

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. William A. Buchecker, Vice President of Mining & Milling
Bokum Resources Corporation Mining & Milling Division
P. O. Box 1833
Santa Fe, New Mexico 87501

Dear Mr. Buchecker:

Pursuant to New Mexico Water Quality Control Commission regulations (enclosed) you are hereby notified that a discharge plan as defined in Section 1-101.I. is required of Bokum Resources Corporation for its proposed Marquez Uranium Mill located in T13N R4W approximately one mile east of the Village of Marquez in Sandoval County, New Mexico.

This notification of discharge plan requirement is made pursuant to Sections 3-104 and 3-106.B., of the above mentioned regulations. Please note that section 3-104 provides "Unless otherwise provided by these regulations, no person shall cause or allow effluent or leachate to discharge so that it may move directly or indirectly into ground water unless he is discharging pursuant to a discharge plan approved by the Director. When a plan has been approved, discharges must be consistent with the terms and conditions of the plan".

A discharge plan is not being required at this time for your existing mining operation west of the Village of Marquez. However, a discharge plan may be required for that operation sometime in the future pursuant to Section 3-106.A.

The New Mexico Environmental Improvement Agency recognizes that considerable information is being submitted pursuant to radioactive material licensing requirements. This information may, if you so request, be used as part of the required discharge plan.

If you have any questions, please contact Maxine S. Goad, or Bruce Gallaher, at the agency address and telephone number above.

Sincerely,

Thomas E. Baca,
Director

TEB:MSG:tpc

cc: Ted Wolff, EIA Radiation
William Bennett, EIA Region I
Ted Brough, EIA, Milan

Attachment 5

HEALTH ENVIRONMENT department

STATE OF NEW MEXICO

JERRY APODACA
GOVERNOR

GEORGE S. GOLDSTEIN Ph.D
SECRETARY FOR HEALTH & ENVIRONMENT

ENVIRONMENTAL IMPROVEMENT DIVISION
P. O. Box 968 - Crown Building
Santa Fe, New Mexico 87503

Mailed April 21, 1978

William E. Biava
Executive Assistant
Bokum Resources Corporation
Post Office Box 1833
Santa Fe, New Mexico 87501

Dear Mr. Biava:

The Environmental Improvement Division has finished a completeness review of your application and determined that although the application is generally responsive to most major issues, there are some areas in which more information is needed as indicated in the attached list. (Attachment 1) The inclusion of this infomation into your application will result in a document ready for review and comment (Event 2, p.4. of our Uranium Mill License Application Guidelines) and a more timely review and evaluation process. We will need ten copies of your response in the form of replacement or added pages to insure adequate review.

The incorporation of your response into the application will insure that the reviewers of the application have adequate information to evaluate the major issues posed by the proposed project. After it is determined that the application is complete, copies will be made available to various state and federal agencies for review and comments. In addition, a public notice will be published in several newspapers in the state. This notice will invite the general public to review and comment upon the application (Uranium mill license application guidelines p. 3).

Please note that this initial review is for completeness only and does not constitute Division approval of or agreement with the proposed facilities or programs contained in the application.

We believe that it is appropriate to use this opportunity to reiterate our concern regarding your proposed tailings dam design. In the interest of a timely review by this and other agencies as well as the public, we ask that your company consider the inadviseability of our distributing the application for review while it contains a proposed dam design which is not in keeping with the philosophy of minimizing public health and safety risk to as low as reasonably achievable. This division is not unique in its assessment of the unacceptability of this type of dam design as can be seen by Attachment # 2.

Your early and complete reply will facilitate timely evaluation and processing of your application. Please contact me if you have any questions regarding this matter.

Sincerely,

Cubra Clayton
Assistant Director

ATTACHMENT # 1

ADDITIONAL INFORMATION REQUIRED FOR COMPLETION
OF BOKUM RESOURCES CORPORATION URANIUM MILL LICENSE APPLICATION

Please provide the following:

I. License Application Summary

1. p 13 - Name and background of the metallurgical consultant and the design engineering and construction firm. Indicate any quality assurance agreements between Bokum Resources Corporation and the construction firm.

II. Radiation Safety Program

1. p 11 - An indication on a map of the mill area, the location of planned radiation measurements and the types of radiation measurements to be performed at these locations;

2. p 17 - An indication of what types of radiation exposure monitoring are planned for the ore loading operator and ore truck driver.

III. Environmental Report

1. Section 2.1 - An indication of the manner in which the leased land in the land grant is managed (Board of Trustees, corporation, etc.), the point of contact for the management body, and the duration of the lease. In addition, if a covenant or other type of agreement has been made with the management body insuring that no residence will be established with ½ mile of the tailings pile while the tailings pile is active and unstabilized, please provide a copy of that covenant;

2. Section 2.1 - An indication of location and ownership of any private land within ½ mile of the tailings pile. In addition, please provide a copy of any covenants or agreements with the owners of these private lands insuring that no residence will be established within ½ mile of the tailings pile while the tailings pile is active and unstabilized;

3. p 2 - 50 - Indicate units for table 2.a, 2.b;

4. Section 2.7 - Any available meteorological data taken at the mill site, indicate when one year's duration of data will become available, and provide wind speed and direction data at the tailings impoundment site;

(Note: Because of the terrain and altitude differences, the meteorological)
(conditions at the mill site may be very different from conditions at the)
(SOHIO site and at Albuquerque. Also the conditions at the tailings)
(impoundment site and the mill site may be different.)

5. p 2 - 8¢, line 11 - A reevaluated statement, since tailings liquid with a pH of around 1 would be harmful if ingested by animals;

6. Section 2.9 - Background measurements of radon and air particulates in the tailing site area;

7. p 3 - 2 - Measures that are employed to minimize wind and rain run-off transport of radionuclides in the stored ore at the ore storage pad;

8. Drawings 3.2 B,C,E, - Specifications for ore dust collector, 01D53190; leach tank scrubber, 03D53390; product wet scrubber, 07D23750; product collectors, 07D25770; and septic system, 10D43140; and include efficiencies of collectors and scrubbers;

9. Drawing 3.2 C - An explanation of how anthracite is disposed of;

10. p 3-9 - Specifications for the yellow cake scrubber and the packaging dust collector. Will the stacks have ports for isokinetic sampling and sampling platforms at the ports?

11. Section 3.3 - An indication of radioactive airborne effluents (Unat, Th230, Ra226, Pb210, and Rn222) from ore storage areas, ore grinding and crushing areas, leach circuit (Rn222 emission), yellow cake dryer and packaging areas, and tailings retention area. In addition, indicate atmospheric emissions due to fuel oil burning in the dryer (ie: NO_x, SO_2, CO_2, and CO);

12. Section 3.4 - A description of how the rain run-off in the mill area is handled;

13. p 3-16 - An indication of whether or not the berms for the leach tanks are large enough to contain the contents of a full tank and an indication of how the berms are constructed;

14. p 3-17 - A description of any drains or sumps to facilitate cleaning in the yellow cake area and general procedures for minimizing dust in the yellow cake area;

15. p 3-17 - An analysis and discussion of why Bokum Resources Corp. considers the utilization of a staged tailings dam constructed of tailings to contain the tailings to be in keeping with the philosophy of minimizing risk to the public health and safety to as low as reasonably achievable, including:

(a) Risk/benefit analysis considering, operational failure modes as well as failure modes due to natural phenomena such as earthquakes, floods, etc.;

(b) How radon 222 emission from the dam is minimized;

(c) How radon 222 emission from the retained tailings is minimized and describe how phreatic line control will be maintained if the tailings are to be wetted;

(d) How transport of radioactive particulates due to wind suspension and water erosion from the dam itself and the retained tailings is minimized;

(e) How the gamma radiation from the retention system is minimized;

(f) How the impact of a dam failure is minimized;

16. Section 3-4 - A description of how tailings and liquor released from a tailings dam failure when the dam is filled to capacity are confined to company controlled land;

17. Section 3-4 - A description of the slurry line design and placement and any associated alarm systems, procedures and systems used to control the effluent from a slurry line break, and any special retention systems used in conjunction with slurry line clean-out and maintenance;

18. Section 3-4 - A description of the post-reclamation tailings pile stabilization program which Bokum Resources Corp. plans to implement after operations are terminated, and indicate how the program fulfills the following objectives:

(1) reduce direct gamma radiation from the impoundment area to essentially back ground;

(2) Reduce the radon emanation rate from the impoundment area to about twice the emanation in the surrounding environs;

(3) Eliminate the need for ongoing monitoring and maintenance program following successful reclamation;

In addition, indicate the cost of this tailings management program for bonding purposes;

19. p3-17 - A description of how liquor from the tailings pile is sent to the evaporation pond; what systems and procedures are used to insure against overflow and possible dike breach. Also indicate systems and procedures used to mitigate the effects of a break in the liquor transfer line;

20. p3-18 - A description, in detail, of the system and procedures used to prevent the dam from being washed out due to flooding since the tailings pile appears to be very close to the main arroyo drainage channel;

21. p3-19 - A description of changes in the tailings pile if the mill increases the capacity to 3000 TPD;

22. p3-19 - A description of how the ditches will be made impervious;

23. p3-19 - Evidence that the evaporation pond is large enough to handle all input liquors and the effect on the evaporation pond of a mill capacity increase to 3000 TPD;

24. p3-21 - An indication of what steps would then be taken if contamination is detected by the monitor wells;

25. Section 3-6 - Radionuclide source terms for the mining activities including the location, amount of material, area, and range of U_3O_8 content for the low grade storage piles;

26. p5-3 - An indication of the height of the stack that vents the grinding mill radon and what parts of the circuit this stack would serve;

27. p5-3 - A description of the manner in which the effluent from the solvent extraction tanks would be vented to the atmosphere;

28. p5-4 - Line 26 - A description of the types of observation and environmental samples to be made;

29. The computer run results along with dose conversion factors used for each radionuclide (in REM/pCi/l) as well as the location, inside stack diameter, gas temperatures and velocities of each effluent stack; (Results of the computer runs do not appear in Appendix D as stated)

30. Section 5.2 - An estimate of the dose to man via the ingestion pathway and indicate the extent and type of farming and grazing in the surrounding area;

31. Section 5.2 - An estimate of the dose to the nearest resident exclusive of radon;

32. p5-10 - The source terms given in Table 5.2A agree with Case 3 in the Sears, et al reference, but the effluent controls given in the application are not in agreement with Case 3. Please indicate source terms corresponding to the proposed effluent controls and revise the dose calculation or change the proposed effluent controls to correspond to Case 3;

33. Section 5.2 - An indication of the dose to the population due to mine effluents and the dose due to the combined mine/mill operation;

34. Section 6.0 - An additional map of much larger dimensions and clarity locating at least the following:

(1) Tailings and evaporation ponds
~~(2) Mine discharge(s) and pond(s)~~
(3) Wells used to gather baseline data
(4) Proposed ground water monitoring network
(5) Surface water sampling station(s) for baseline and operational monitoring
~~(6) Major geographic features~~
(7) Predicted ground water flow paths in the water bearing zones most likely to be affected by the discharge;

(Note: SER'd Drawing No. 1 labeled "Marquez Mine and Mill Area Air and Water Sampling Locations - Bokum Resources Corp." Conceptualizing the overall water quality monitoring program is difficult due to the rather small representation of the site area.)

35. Section 6.0 - (1) Monitor well construction details:
(a) total depth and diameter of bore holes
(b) casing diameter and length
(c) perforated and/or screened intervals
(d) whether the wells will be capable of being pumped or not;

(2) Sampling frequencies (ground and surface waters), tabulation of water chemical parameters to be analyzed for, reporting frequencies;
(3) Contingency plans for rectifying any contamination problems;
(4) Post-operation restoration procedures;
(5) Discussion to support the placement and completion details of the monitor wells with specific reference to predicted migration pathways.
(6) How the concentration of Pb210 in water is monitored.

36. Section 6.0 - Additional geohydrologic data:

(1) All available lithologic logs from nearby wells or exploration holes (company owned, municipal, and private) and from mine shaft construction activities;

(2) Site specific potentiometric contour map(s), if available, or at a minimum, additional water level data to support prediction of ground water flow path(s);

37. Section 6.1.5 - An indication of how preoperational air concentrations of Unat, Th230, Ra226, Rn222, and Pb210 and meteorological characteristics at the tailings pile location are determined and provide the results of that determination;

38. Section 6.2.1.1 - An indication of how the Pb210 concentration in stack effluents is monitored;

39. Section 6.2.1.1. An indication of how operational gamma levels are monitored;

40. Section 6.2.1.1 - An indication of how operational air concentrations of Unat, Th230, Ra226, Rn222, and Pb210 are monitored at various boundary locations around the tailings pile;

41. Section 6.0 - A description of operational monitoring data analysis and reporting procedures;

42. p7-6 - An indication of the location of the mill run-off collection basin on a map.

43. p7-7 - An indication on a map of the area affected by a dam failure at maximum capacity and the ownership of the affected land and the quantities of tailings and radioactive liquor involved;

44. Section 7 - An analysis of the impact of a slurry line break and indicate the procedures and systems used to mitigate the impact;

45. p7-9 - Procedures and routes used for shipping yellow cake and total expected number of miles of travel during the lifetime of the mill. Also describe the qualification of the members of the mill's transportation accident emergency response team and the equipment which would accompany the team;

46. Section 9 - Refer to comment number 18 and provide the details of that response for this section; in addition, provide expected costs for mill decontamination at shutdown;

47. Section 10 - An analysis of alternative tailings pile sites, alternative tailings treatment and retention systems, and alternative long-term tailings stabilization techniques. The analysis should include the rationale for choosing the proposed site, systems, and techniques, instead of the alternatives.

48. Appendix A - An indication of whether Bokum Resources Corp. will follow the recommendations given regarding the mill foundation placement and the cut-off trench;

49. Appendix E - Units for the data given in Table 8.

50. Appendix F - An indication of increased inflow to the diversion ditch due to the presence of snow in the upper elevations when it begins to rain; and

51. Appendix H - A map # 3 referred to on page 5.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

MAR 7 1978

Ref: SA/JFK

Colorado
New Mexico
Texas
Washington
Arizona
Idaho
Nevada
North Dakota
Oregon

Attached for your information is the Fuel Processing and Fabrication Branch position regarding the use of uranium mill tailings in the construction of mill tailings dams.

J. O. Bradley, for

G. Wayne Kerr, Assistant Director
for State Agreements Program
Office of State Programs

Enclosure:
As stated

FUEL PROCESSING AND FABRICATION BRANCH POSITION REGARDING USE OF URANIUM MILL TAILINGS IN CONSTRUCTION OF MILL TAILINGS DAMS

The NRC policy as reflected by Regulatory Guide 3.11 is that tailings may only be considered as dam construction material in special cases. The NRC may consider, for example, tailings as a construction material for a raise of an existing dam already having upstream raises made of tailings and then with strict assurances regarding stability. The NRC would not, however, consider a new tailings impoundment proposal that would utilize tailings as a dam structural material.

The NRC has authorized one new milling operation in the last three years and is currently evaluating five new mill proposals. Neither the authorized operation nor any under review propose tailings as a dam structural material.

Based on recent evaluations of tailings management alternatives for new mill proposals within NRC jurisdiction the NRC would encourage the agreement states to consider the elimination of surface disposal of tailings, regardless of dam construction materials proposed. The major reason for requiring some form of below grade disposal system is that such disposal clearly provides greater assurance that the buried tailings will not be disturbed by man or by natural phenomena over the long term.

BOKUM RESOURCES CORPORATION

P. O. Box 1833
142 W. Palace Avenue
Santa Fe, New Mexico 87501
(505) 982-1824

April 24, 1978

State of New Mexico
Environmental Improvement Agency
Radiation Protection Division
P. O. Box 2348
Santa Fe, New Mexico 87501

Attention: Pat Donahoe

Dear Pat:

Included you will find ten copies of the tables missing from Appendix D of our Environmental Report. We apologize for the inconvenience that this oversight may have caused you.

Please call me if you have any further questions.

Sincerely,

John P. Gamertsfelder

JOHN P. GAMERTSFELDER

Encl.
JPG:cs

Attachment 7

JERRY APODACA
GOVERNOR

GEORGE S. GOLDSTEIN, Ph.D.
SECRETARY FOR HEALTH & ENVIRONMENT

HEALTH & ENVIRONMENT department

STATE OF NEW MEXICO

ENVIRONMENTAL IMPROVEMENT DIVISION
P.O. BOX 968 - CROWN BUILDING
SANTA FE, NEW MEXICO 87503

PH: 827-5271
Ext. 201

OFFICE OF THE DIRECTOR

May 3, 1978

William E. Biava
Executive Assistant
Bokum Resources Corporation
P.O. Box 1833
Santa Fe, NM 87503

Dear Mr. Biava:

This letter is to confirm the discussion that we had at our meeting on April 25, 1978 regarding your proposed tailings dam design for the Marquez Uranium Mill Project. The Environmental Improvement Division (EID) cannot give its approval of a staged tailings dam constructed of tailings for the Marquez project. Your license application, therefore, cannot be approved while such a tailings dam design is proposed.

The primary reasons for EID's position regarding this matter are the following:

1. Article V of the agreement between the State of New Mexico and the Atomic Energy Commission (now the U.S. Nuclear Regulatory Commission, NRC) which became effective on May 1, 1974, states in part that "the State will use its best efforts to cooperate with the Commission and other Agreement States in the formulation of standards and regulatory programs of the State and the Commission for protection against hazards of radiation and to assure that the State's program will continue to be compatible with the program of the Commission for the regulation of like materials". Since the NRC would not consider a new tailings impoundment proposal that would utilize tailings as a dam construction material (see attachment #1), it is incumbent upon the EID to consider such a proposed dam in the same light in keeping with the aforementioned agreement.

2. Section 3-310 of the Radiation Protection Regulations states in part that "A license application will be approved if the Agency (now EID) determines that . . . the applicant's proposed equipment, facilities, and procedures are adequate to minimize danger to public health and safety or property". In addition, Section 4-100.B states in part, "every reasonable effort should be made to maintain radiation exposure and releases of radioactive materials in effluents to unrestricted areas, as far below the limits specified in this part as practicable". It is the position of the EID staff that a staged dam made of tailings for a new mill is not adequate

to minimize radiation exposure and releases of radioactive effluents to as low as reasonable achievable. I believe that the reasons for this position have been adequately described to you in the meetings of January 17, 1978, February 6, 1978 and April 25, 1978.

I recommend that you amend your application with a tailings dam design that this Division can approve. Such an amendment along with your response to Mr. Clayton's letter of April 7, 1978 would complete your application to the point that the next phase of the licensing process could be initiated.

Please contact me if you have any questions regarding this matter.

Sincerely,

Thomas E. Baca
Director

Enclosure

ATTACHMENT No. 1

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

MAR 7 1978

Ref: SA/JFK

RECEIVED
MAR 13 1978
RADIATION PROTECTION SECTION

Colorado
New Mexico
Texas
Washington
Arizona
Idaho
Nevada
North Dakota
Oregon

Attached for your information is the Fuel Processing and Fabrication Branch position regarding the use of uranium mill tailings in the construction of mill tailings dams.

J. D. Nelson, for

G. Wayne Kerr, Assistant Director
for State Agreements Program
Office of State Programs

Enclosure:
As stated

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