September 7, 1999

Docket No. 040-08980 License No. SMB-1541
Control No. 127200

Anthony J. Thompson, Esquire
ShawPittman
2300 N Street, NW
Washington, DC 20037-1128

Dear Mr. Thompson:

This follows up our August 19, 1999 letter regarding the NRC's Environmental Assessment of the Heritage Minerals, Inc. (HMI) Lakehurst, New Jersey site and review of the Final Status Survey Plan (FSSP) for termination of the HMI license. During our review we requested additional clarifying information related to decommissioning activities noted in the FSSP. Your letters dated November 30, 1998, June 24,1999, July 13, 1999, and August 17, 1999 provided the commitments necessary to sufficiently supplement the information in the FSSP to allow the NRC to assess the potential environmental impacts from the proposed decommissioning activities. We have amended the HMI license to include these letters. Enclosed with this letter is the amended license.

Please review the enclosed document carefully and be sure that you understand and fully implement all the conditions incorporated into the amended license. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region I Office, Licensing Assistance Team, (610) 337-5093 or 5239, so that we can provide appropriate corrections and answers.

Thank you for your cooperation.

Sincerely,

Original signed by Ronald R. Bellamy

Ronald R. Bellamy, Chief
Decommissioning and Laboratory Branch
Division of Nuclear Materials Safety

Enclosure:
Amendment No. 3

cc:
John F. Lord, P.E.,

ML10

DOCUMENT NAME: B:\DNMS Documents\Lic Cover Letter\LSMB-1541.127200.wpd 366532

To receive a copy of this document, indicate in the box: "C" = Copy w/o attach/encl "E" = Copy w/ attach/encl "N" = No copy

OFFICE	DNMS/RI	N	DNMS/RI					
NAME	CGordon CG		RBellamy RA					
DATE	09/07/99		09/8/99		09/ /99		09/ /99	

OFFICIAL RECORD COPY

Heritage Minerals, Inc.

ONE HOVCHILD PLAZA
4000 ROUTE 66
TINTON FALLS, NJ 07753
(732) 922-6100 · FAX (732) 922-9544

August 17, 1999

040-08980

Mr. Craig Z. Gordon
Sr. Health Physicist
U. S. Nuclear Regulatory Commission
Region 1
475 Allendale Road
King of Prussia, PA 19406-1415

Re: License #SMB-1541

Dear Craig:

In accordance with your request and upon advice from counsel, the answers to your questions, submitted in the fax dated July 21, 1999, are included in the enclosed copy of a letter, dated August 16, 1999, from R.S.I. to A. J. Thompson, Esq.

Also, for your information, I am enclosing a copy of the resumes for Tom Bracke, P.E. and Scott W. Dennerlein, principals of Radiation Science, Inc., the firm which produced the FSSP.

If any clarification is required, please advise.

Sincerely,

John F. Lord

John F Lord, P E.

JFL:sae

Enclosures

cc Tom Bracke, R.S.I.
A. J Thompson, Esq.

FULL COST RECOVERY ACTION

TAC NO. U01148

127200

C \My Documents\Miscellaneous Correspondence\J. Lord to US Nuc Reg Com doc

OFFICIAL RECORD COPY ML 10

REC'D IN LAT AUG 23 1999
~~AUG 20 1999~~

RSI

Radiation Science Inc.
10 South River Road
Cranbury, NJ 08512

August 16, 1999

Anthony J. Thompson
Shaw Pittman
2300 N Street, NW
Washington, DC 20037-1128

Dear Mr. Thompson:

Enclosed please find our responses to the NRC's questions regarding the FSSP for Heritage Minerals. The responses are necessarily general, as we do not have a detailed work plan, Health and Safety Plan, or destination for the material. All of these would greatly impact the potential public exposure during transportation. In a similar manner, the emergency response procedures are dependent on the destination and mode of transport.

Q1. Please provide an estimated dose calculation of worker and public exposure from the planned activities. Be sure to consider average thorium concentrations in the pile and assume all soil will be excavated and packaged.

A1. Worker dose due to penetrating radiation is estimated based on eight hours per day, five days per week, for eight weeks. Using an average exposure rate of the monazite pile, 1 mR/hr, the estimated dose would then be 320 millirem.

Worker exposure due to inhalation is estimated based on NUREG-1400, "Air Sampling in the Workplace" It is estimated to be less than 10% of the Annual Limit of Intake, specified in 10 CFR 20, for Th-232. The calculations are on an attached sheet. Although the potential exposure is estimated to be quite low, the respiratory protection program outlined in the "Project plan for Decommissioning of NRC License #SMB-1541" will be instituted.

Public exposure due to the planned activity is estimated to be below the sensitivities of any monitoring system. There is no discernable increase in dose rate above background at any publicly accessible area due to the monazite pile. A dust suppression program will be in place during excavation activities, and the monazite pile is approximately one mile from the nearest public access road. Therefore public exposure due to airborne radioactivity will be nonexistent.

RSI

Q2. Please explain the organizational relationship (reporting chain) between HMI staff, including the radiation safety officer and the decommissioning contractor.

A2. John Lord will be the administrative contact for Heritage Minerals (HMI). The Radiation Safety Officer (RSO) will be Adrian E. Albrethsen Ph.D. Dr. Albrethsen is the RSO on HMI's Materials License and will advise Mr. Lord on all matters regarding radiation safety. The contractor, to be appointed by HMI, will report directly to Mr. John Lord. The decommissioning contractor will appoint a qualified Health and Safety Manager, and Project Manager to report to John Lord.

Q3. Please describe the type of dosimetry worn by workers.

A3. Workers will be provided with TLD's to be worn on-site during the course of the project. These TLD's will be collected at the end of the project, to record dose from this project only. In addition, the workers will continue to wear the TLDs issued as part of their routine radiation worker monitoring. In this way the dose from the decommissioning activites will be known, as well as being recorded on the workers annual dose record.

Q4. Please explain the notification or response procedure used to handle incidents and emergencies.

A4. A 24-hour hot line will be established by HMI during the course of the project. All incident and emergency notification will be made to Dr. Albrethsen through this number.

If you have any other questions do not hesitate to contact us.

Sincerely,

Scott W. Dennerlein

cc. John Lord

RSI

Airborne Hazards Determination for Excavation and Packaging of the Monazite Pile.

Calculations assume maximum activity allowed by the NRC license is being handled at one time. All confinement factors, release fractions, modifying factors, and the following equation are taken from NUREG-1400 "Air Sampling in the Workplace"

$$I = \frac{Q \times R \times F}{10^4 \times ALI \times C}$$

where; I = expected intake as a percent of the ALI
Q = source term in Ci *
R = release fraction (nonvolatile powders = 0.001)
F = other modifying factors (0.1)**
C = confinement factor (normal = 0.1)
ALI = 10CFR20, App. B, Table 1, Col. 2
For Th-232 1×10^{-9} Curies

$$\frac{(0.06\ Ci)(0.001)(0.1)}{(10^4)\ (1 \times 10^{-9} Ci)\ (0.1)} = 6\%$$

Therefore the expected intake would be 6% of the Annual Limit of Intake.

* Source term (Q) is based on 15,000 kilograms of material at a concentration of 4,000 pCi/g.
** The monazite sand is very heavy and will be wetted during excavation. Therefore the value of R for powders is overly conservative, and so is corrected for with this factor.

ShawPittman

A Law Partnership Including Professional Corporations

ANTHONY J. THOMPSON
202.663.9191
anthony.thompson@shawpittman.com

August 13, 1999

Mr. Craig Gordon
U.S. Nuclear Regulatory Commission
Region 1
475 Allendale Road
King of Prussia, PA 19406

Re: Heritage Minerals, Inc.: Mill Equipment

Dear Craig:

With respect to the equipment at Heritage Minerals, Inc.'s mill that was previously decontaminated, all such equipment will be rechecked and not removed from site or disposed of until it satisfies decommissioning limits.

With all best wishes.

Sincerely,

AJ Thompson/ ons

Anthony J. Thompson

ShawPittman

A Law Partnership Including Professional Corporations

ANTHONY J. THOMPSON
202.663.9198
anthony.thompson@shawpittman.com

July 13, 1999

Mr. Craig Gordon
U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406

Dear Craig:

Enclosed is a revised Standby Trust Agreement and a revised draft Project Plan for Heritage Minerals Inc.'s (HMI) decommissioning and decontamination (D&D) program.

HMI continues to actively pursue D&D options but naturally is anxious to have its program "grandfathered" before August 20, 1999. Should you have any questions please do not hesitate to call as time is of the essence.

In closing, I note that HMI has done some analyses of the potential impact of the HMI/ASARCO mining and milling activities on local groundwater. Those analyses, which will be provided to NRC with the results of the Final Status Survey Plan (FSSP) for license termination, demonstrate that there have been no adverse impacts on groundwater at the HMI site. It would also note that the proposed clean up of the monazite pile and decontamination of the mill will pose no threat to local wildlife and similarly, there is no potential risk to aquatic life from such activities, particularly compared with the active mining and milling activities of the past.

With all best wishes.

Sincerely,

Tony

Anthony J. Thompson

JUL 14 1999

Heritage Minerals Inc.'s (HMI's) Plan for the Decommissioning and Decontamination (D&D) of the Site Subject to NRC License #SMB-1541

Project Management

The contractor selected to perform the decommissioning will be licensed to utilize any licensable equipment by the U.S. Nuclear Regulatory Commission (NRC) and qualified by experience to manage a project of this scope. The following list of activities as prescribed in NUREG-5849 will be used as a planning guide.

- Terminate the possession and storage of radioactive material.
- Remove radioactive material from the facility.
- Properly dispose of any radioactive material.
- Submit an NRC Form 313 "Disposition of Radioactive Materials."
- Conduct Final Site Survey.
- Submit report to the NRC.
- NRC License Termination.

Site Mobilization

- An unaffected building will be used to establish alpha background activity for concrete and metal substrates which comprise the construction of the affected buildings on site.
- Environmental dosimeters will be placed at locations around the site prior to any D&D work, particularly near the monazite pile, work areas and background locations. Similarly, prior to any D&D work, dosimeters will be evaluated and, if necessary, calibrated, and at the completion of D&D activities collected and evaluated again. An air sampling unit will be set up near and downwind of the monazite pile. A baseline air sample will be obtained prior to any D&D work. The environmental monitoring is intended to evaluate potential doses to workers and members of the public due to the D&D process.
- Prior to any D&D work on site, both of the mill buildings will be closed to the maximum extent practical to prevent intruder penetrations and/or inadvertent contamination by wind or water forces.

- A secure, fenced-in exclusion area near the existing pile will be set up for the staging of shipping containers filled with monazite ore and any equipment that cannot be released and has been removed from the site buildings. The enclosure will have a gate access that will be locked when the area is unattended, maintaining the security of licensed material per 10 CFR Part 20.

- A site specific Health and Safety Plan (HASP) will be prepared prior to commencement of any D&D work.

(1) Removal of the Monazite Pile

- Monazite ore will be placed into a hopper via a front end loader which will transfer it into a shipping container. Since the monazite pile was deposited on natural soils, the depth of the "first cut" will be determined by the color differential between the dark monazite ore and lightly colored underlying sands. The equipment used to remove the pile will be directed to keep the wheels on "clean" ground during the excavation. Monazite ore will be recovered from any metal drums and packaged as above. Empty drums will be surveyed for release using the criteria that have been established in the Final Status Survey Plan (FSSP). Once the pile has been cleared and packaged, further clean-up will be guided by scanning the area with a shielded Nal crystal to achieve no more than twice-background levels. Workers in this phase of the project will have the required DOT "hazmat" shipper training.

- Twice each day as required by environmental conditions and prior to excavation work, the pile will be sprayed with water to reduce the potential for airborne particulates. Equipment operators and workers in the immediate area will wear respiratory protection until the site supervisor has determined that the occupational limits on airborne activity in 10 CFR 20 are not exceeded. Provided these limits are not exceeded, dust masks will be used for the duration of the work.

- All personnel on site will be badged for evaluation of cumulative exposure during the project.

- At the end of each day, equipment used to transfer the monazite will be located within the exclusion area. A thorough survey of the equipment used to transfer the monazite will be made at the end of the packaging process and will be cleaned as necessary and released after the process has been completed.

(2) Survey and Sample Outdoor Affected and Unaffected Areas

- A 10m by 10m grid will be established and referenced to a permanent landmark. As described in the FSSP each grid will be surveyed and soil samples obtained as required by

the plan. Samples will be sealed with completed chain of custody forms and sent to an NRC licensed laboratory for analysis. Samples will be processed and sealed in counting containers for at least 3 weeks prior to counting to allow secular equilibrium to be achieved. No grading or back-filling will be conducted until after NRC confirmation of the sampling results.

(3) Final Status Survey

- With survey instruments under proper quality control (see FSSP), the final release survey will be initiated at the highest elevation of equipment and proceed downward to ground level. Completed survey units and individual sample locations will be clearly marked for easy replication. The wipe samples for removable radioactivity will be obtained first. Then the area will be wiped clean with a damp cloth and allowed to dry to remove any dust or film that would shield a alpha emitting isotope fixed to the surface of the equipment. The fixed component of any residual radioactivity will then be measured.

- If equipment is discovered which can not be released, an attempt will be made to clean it in place using a HEPA filtered vacuum unit. Suitable PPE and dust masks will be worn during any vacuuming operations. Any item with fixed activity will be dismantled and each piece brought to an area designated for further cleaning on the ground level. Inside a temporary enclosure with HEPA filtered ventilation, various cleaning techniques will be attempted. Equipment which cannot be cleaned to below the release limits in the FSSP after several attempts will be packaged in B-25 boxes and placed in the fenced exclusion area. All such material will be disposed of in a licensed facility.

- Once all designated equipment survey units have been surveyed and any items which can not be released removed, the building survey will be conducted. Walls up to two meters and then floors will be surveyed according to the FSSP. At the completion of the survey, the building will be closed and secured to the extent possible. The temporary lighting will be left in place for any confirmatory surveys.

(4) Final Report

- All field logs, QC charts, and raw data will be reviewed as part of the data validation process. The QA parameters as discussed in the FSSP will be evaluated. Approved data will be used in the statistical data reduction process specified in the FSSP. Survey diagrams will be reviewed and the sample location verified. The final report will provide a discussion of the methods used onsite, a summation of the data, and a statement on the suitability of the site for unrestricted release. Appendice will include raw data, personnel/environmental monitoring data, shipping manifest, QC/field logs, and any other information necessary for a thorough review.

ShawPittman

A Law Partnership Including Professional Corporations

ANTHONY J. THOMPSON
202.663.9198
anthony.thompson@shawpittman.com

June 24, 1999

Ronald R. Bellamy, Chief
Decommissioning and Laboratory Branch
Division of Nuclear Materials Safety
Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, Pennsylvania 19406-1415

Re: Heritage Minerals, Inc. (HMI) Final Status Survey Plan

Dear Ron:

This letter responds to your March 16, 1999 letter regarding HMI's FSSP and addresses three important issues raised in that letter.

First, we are including for your reference and comments a draft work plan for site cleanup that ultimately will be incorporated into a contract with the remedial contractor chosen for the job.

Second, with respect to NRC's questions regarding the designation of three areas (i.e., tails transfer sump (SU 12), non-magnetics feed sump (SU 24) and tails sump (SU 28), HMI will designate these areas as *"affected by proximity"* as none of these units were "locations where radioactive materials were used or stored." This distinction is important because HMI would not want areas adjacent to these three units to be considered "affected" and areas adjacent to those areas as "affected" - pretty soon the whole site and perhaps the entire state is "affected".

Third, a standby trust agreement for receipt of decommissioning funds from the letter of credit has finalized and is included with this letter.

HMI appreciates the cooperation of NRC staff in our efforts to move forward towards final decommissioning of the NRC licensed areas. It is our hope that with this letter in hand the staff can complete approval of HMI's FSSP prior to the August 20, 1999 grandfathering date.

Please do not hesitate to call me with any questions.

With all best wishes,

Sincerely,

Tony

Anthony J. Thompson

SHAW PITTMAN
POTTS & TROWBRIDGE
A PARTNERSHIP INCLUDING PROFESSIONAL CORPORATIONS

2300 N Street, N.W.
Washington, D.C. 20037-1128
202.663.8000
Facsimile 202.663.8007

ANTHONY J. THOMPSON, P.C.
202.663.9198
anthony_thompson@shawpittman.com

New York
Virginia

November 30, 1998

Mr. Mark C. Roberts, Chief
U.S. Nuclear Regulatory Commission
Decommissioning and Laboratory Branch
Division of Nuclear Materials Safety
Region 1
475 Allendale Road
King of Prussia, Pennsylvania 19406-1415

Dear Mark:

Enclosed are Heritage Minerals Incorporated's (HMI's) responses to The Nuclear Regulation Commission's (NRC's) and New Jersey Department of Environmental Quality (NJDEQ's) comments on HMI's proposed final status survey plan (FSSP) for license termination. We hope HMI's responses adequately address to the comments on the FSSP. Please do no hesitate to call if you have any further questions.

I am also taking this opportunity to report to NRC on several matters that were addressed during the August 4, 1998, inspection of the site and/or in the August 31, 1998 inspection report (Docket No. 040-08980) as follows:

(1) The potentially hazardous chemicals in the laboratory at the site were removed on October 25, 1998;

(2) The eight (8) radiation signs around the monazite pile have been replaced twice since the inspection with the proper signs and the few damaged pickets in the fence around the pile have been replaced;

(3) The original fabric cover for the monazite pile was more damaged than originally thought. As a result, new fabric has been received and was put in place by the labor crew on October 22 1998. The crew also put fill dirt around the low areas underneath the fence;

SHAW PITTMAN
POTTS & TROWBRIDGE
A PARTNERSHIP INCLUDING PROFESSIONAL CORPORATIONS

(4) As noted during the inspection, there continues to be no indication of any vandals attempting to intrude inside the fence around the monazite storage area;

(5) A revised schedule based on some recent progress with Malaysia and the assumptions in the previous proposed decommission schedule submitted December 30, 1996 is contained in the attached response to the NRC and NJDEP comments on the FSSP.

Please call me or John Lord at HMI if you have any questions.

With all best wishes,

Sincerely,

Anthony J. Thompson

AJT/cls
cc: Craig Gordon
Marie Miller

#669441

Document #: 669441 v.6

RESPONSE TO NRC'S AND NJDEP'S COMMENTS ON HMI'S FSSP

I. **NRC Comments.**

1. Section 3.0 Decommissioning Activities -

Comment: NRC noted that proposed dates outlined in the December 30, 1996 letter regarding completion of decommissioning at the facility will not be met and, therefore, requests a revised schedule including expected milestones to complete final remediation.

Response: As noted, the political situation in Malaysia has definitely slowed progress in obtaining approval to ship the monazite. However, it now appears that L & T Minerals has made some favorable progress in satisfying the relevant Malaysian government bureaus which suggest that a definitive answer will be received. A copy is attached of the September 7, 1998 fax request for a 5 kilogram sample of the material to be sent to Malaysia, as well as the sample results obtained by an independent U.S. laboratory. The U.S. lab samples were easily obtained, analyzed and submitted to L & T Minerals, copy attached. The 5 kilogram sample was received in Kuala Lumpur on October 12, 1998. Delays were entirely due to customs protocols. Assuming that the Malaysian response is favorable, the schedule would track the schedule provided to NRC on December 30, 1996 as follows:

(a) Complete agreement with L&T Mineral Company **(Estimated time for completion - December 31, 1998 to March 15, 1999).**

(b) Purchase and receive delivery of steel drums and freight containers and complete agreements with necessary freight forwarders, trucking and shipping companies and assemble and train necessary work crew. **(Estimated time for completion - March 15, 1999 to June 15, 1999).**

(c) Fill steel drums with monazite sands, load drums into containers and perform verification analyses of soils underneath the monazite pile, surveys and wipe tests of the mill facility and, if necessary, scrape up additoinal soils for loading and transport with the monazite sands and perform any necessary additional decontamination of the mill facility. **(Estimated time for completion - June 15, 1999 to August 15, 1999).**

(d) Complete final inspection and verification by NRC. **(Estimated time for completion - September 15, 1999).**

(e) Load containers on to flatbed trailers, transport to port and load on board ship. **(Estimated time for completion September 15, 1999 - October 15, 1999).**

(f) Apply for and receive license termination and contingency period for unexpected delays. **(Estimated time for completion October 30, 1999 - December 31, 1999).**

Comment: The organization and individuals involved in accomplishing remediation and having management responsibilities to implement the project components, oversee field operations, sample collection analyses, etc. were not included in the FSSP and this information will need to be developed prior to initiation of full scale remediation efforts.

Response: A contract has not been negotiated with an appropriate contractor to provide the management and oversight services for decommissioning the mill and the monazite pile. Discussions are ongoing with several potential contractors and the contractor chosen will provide a "work plan" to NRC that will address these management and oversight issues. HMI has received proposals from two (2) qualified firms (RSI and CDM) to act as the project manager to pack and ship the monazite, then complete the decontamination and decommissioning. Two more proposals are being prepared by other qualified firms who understand that they may be too late.

2. 4.0 Release limits -

Comment: Information described in this section appears to relate only to alpha emissions without consideration of the presence of beta emitting isotopes. When comparing soil concentration and surface activity to Table 2 release limits, each type of exposure should be considered independently. The exposure rate release limit of 10 microR/hr should be used as a guideline for outdoor measurements and 5 microR/hr for indoor release limits.

Response: The language in Section 4.0 was derived from Reg. Guide 1.86 and the Branch Technical Position (BTP) (46 Fed. Reg. 52061, October 23, 1981), Option 1, and the language in HMI's license condition in Section 14.

3. Section 4.3 Exposure Rate -

Comment: Radiation survey and scanning techniques should be described for potentially contaminated indoor areas.

Response: Exposure rate surveys will be conducted by holding the meter at waist level and walking slowly in parallel lines approximately 10 feet apart over the entire indoor area. The surveyor will stop at the center of each grid and record the reading. Elevated readings will be recorded on the field notes.

4. **Comment:** Soil concentration to exposure calculations must demonstrate that both the soil release guideline limit from the exposure rate guideline limit from the BTP are met. Since 10 C.F.R. Part 20.11101(b) requires occupational doses and doses to members of the public to be ALARA some clarification is needed on the FSSP statement that final soil cleanup "will meet the spirit of ALARA ."

Response: The soil exposure rate is based on the language contained in the BTP, Option 1, which will be compared with background concentrations and exposure rates as set forth in the RSI Background Report. With respect to ALARA, process knowledge regarding the monazite pile content as compared to the site background levels leads to the presumption that radionuclide concentrations in the monazite are sufficiently higher than background concentrations that post-cleanup soil concentrations and exposure rates will be far below the BTP guidance levels. In addition, since as a practical matter, removal of the monazite will necessarily involve picking up some of the uncontaminated soil beneath the monazite pile leaving essentially natural background levels in the soil remaining after cleanup, ALARA will be satisfied.

5. Section 5.0 - Appendix B -- Affected and Unaffected Survey Units.

Comment: Although process trains are clearly identified, it appears that certain areas require further review to determine the potential for contamination. NUREG 5849 specifies that "affected" areas include "areas immediately surrounding or adjacent to locations where radioactive materials were used or stored." From review of information provided in previous correspondence and the FSSP, the following areas should be reexamined as being "affected:"

a. Laboratory (adjacent to dry mill) - used for sample analysis.

Response: Laboratory (adjacent to dry mill) was not used for sample analysis.

b. Tails Transfer Sump (SU 12) - sample analysis shows possible contamination.

Response: It is not clear what sample analysis is being cited that indicates possible contamination. The 120 ppm Th + U used in the FSSP is well below the 500 ppm for source material.

c. Table Spirals (SU 16) - proximal to table feed sump, involved material concentration.

Response: Although Table Spirals (SU 16) were in close proximity to the Table Feed Sump, they were upstream from the Table Feed Sump and the material flowed by gravity. Therefore, it is physically impossible for material to go backwards from the Table Feed Sump to the Table Spirals. Thus, the Table Spirals are "unaffected."

d. Non-magnetics Feed Sump (SU 24) - contains residual separated monazite.

Response: Regarding the Non-magnetic Feed Sump (SU 24), the description in the FSSP states that it received the non-magnetic sand "still containing the monazite." However, it did not state that the monazite was separated or concentrated. The High Intensity Wet Magnetic Separator at this point in the process does not have sufficient field strength to pull the monazite as a magnetic product. Only the leucoxene was separated magnetically in this part of the process. Later in the process, when a much stronger High Intensity Dry(?) Magnetic Separator was used in the dry mill, the monazite was magnetically separated.

e. Tails Sump (SU 28) - final process release point.

Response: The Tail Sump (SU 28) only handled plant tailings (light minerals) and excess process water. It is, therefore, unaffected.

f. Wet Mill Floor (SU 45) - potential for contamination (proposed grid survey adequate).

Response: The Wet Mill Floor (SU 45) should not be considered "affected," except perhaps the area around the table operation where there was a potential for spillage of table products to take place. In accord with NUREG-5849, identification of indoor hotspots in "unaffected" areas with activity levels that exceed 25% of the guideline value requires reclassification of the area as "affected." Similarly, if outdoor hotspots exceed 75% of the guideline value, it is reclassified as "affected."

6. Section 6.1 - Affected Survey Units Outdoor

Comment: Instrument information is incomplete with regard to detection methodologies for fixed removable contamination on surfaces and for soil measurements. The minimal number of samples expected to be taken from the monazite pile should be shown and from the process trains is unclear whether individual process units that could be potentially contaminated would be included in the survey.

Response: The instrument information will be included in a detailed "work plan" provided by HMI's D&D contractor. Because individual process units in a given survey unit are identical with respect to the material processed, surveying 10% of them will reveal any contamination, which would then reclassify the entire survey unit as affected, thereby necessitating a

survey of all of the individual units. One sample will be collected from each 10 meter by 10 meter grid beneath the monazite pile.

7. Section 7.1 - Buildings and Equipment

Comment: Information described in this section relevant to decontamination of equipment is limited only to surface layers and does not relate to what is likely to be required following dismantling and scanning the equipment noted in Section 6.1.

Response: All of the equipment in the affected areas as set forth in FSSP was cleaned (including dismantling pumps and other equipment requiring cleaning of interior parts) in 1991. In fact, some of that equipment was not fully reassembled and remains in semi-disassembled state today. After closure, the two mill buildings and the operating equipment (Survey Units) were repeatedly cleaned and measurements taken until an acceptable level of readings were obtained. The radioactivity is entirely in the sand grains, thus only surface contamination would occur. Since there was no immediate intention to use the buildings or process equipment the following practice was used:

Initially, cleaning in the wet mill was done by operating on water alone until the surface reading of the units averaged about 20m R/hr. Second stage cleaning was done by high pressure water, steam and physically removing any accumulated sand until the readings were within the 20m R/hr. range. Where necessary, access holes were cut in the larger sumps to assure that any free running or packed wet sand was removed. Unfortunately, readings were not recorded separately for all units but the attached tabulations of field records show an average range and in some cases readings for specific units. The same procedure was followed in the dry mill but their cleaning was done by blowing, dusting and sweeping, but an attempt was always made to reduce the readings to levels that would not be hazardous to humans. An inspection was made by NRC technicians after the original decontamination was finished and random gamma readings were taken by one of the technicians (Betsy Ullrich). I thought there were some records of this but none can be located so I doubt that any exist. This was not an official visit, but readings were comparable to HMI's.

All of the smaller pumps were disassembled but only the face plate of the larger units were removed for cleaning. Not all units were reassembled or replaced on the pump bases or racks. This makes it difficult to determine to which unit various parts belong. As noted before there was no intention to reuse the units, therefore, routine inventories or records were not kept to identify what may have happened to individual pieces. As a result, a survey has been made of both mills to determine the status of the units. Some assumptions were made but as shown on the attached tabulation most units were accounted for. These data were developed based on the best of our recollection and review of any available data. Importantly, as nearly as can be determined all of the "affected" units or separate parts of the dry mill equipment from "affected" units were never removed and remain in the building except for Survey Unit #43 which was removed from the dry mill and stored in the wet mill. The attached Table A shows the present location of the various survey units which have been moved or can not be located. Fortunately all parts from the "affected" wet mill units are either in place or stored in the wet mill. (E.g., as can be seen

from Table "A", all parts of the two (2) affected units, 30 and 32, are either in place or stored in the mill. As shown on Table "A", unit 43, located in the dry mill, was removed to the wet mill "affected" area and stored.) We believe that four of the listed not-in-place "unaffected" pumps and possibly another unused sump which is not on the flowsheet were sold. However, since a lot of trespassing and vandalism occurs at the site it is possible that some of these components and some electrical equipment, miscellaneous parts, tools, etc. may have been stolen. HMI believes that any pieces of equipment that were stolen, put into the trash or sold, presented and present no significant public health hazard.

8. Section 10 - Quality Assurance

Comment: The QA program needs to be set forth including how surveys are to be performed, experience of individuals taking surveys, instrument calibrations, review of data and survey results, and conduct of independent audits.

Response: These matters will be addressed in the contractor's "work plan" and will comport with NUREG 5849 and MARSSIM.

9. Report of Site Background, Page 2

Comment: For the number of U238 samples the data shown in the statistical analyses chart for mean background measurements, .31, and standard deviation, .11, differ from the page two calculation.

Response: To determine the number of samples necessary to characterize background a limited number of samples are collected (in this case ten) and the mean and standard deviation used to determine how many more samples should be collected. On page two of the Background Determination Report, the mean and standard deviation of the ten initial samples is .36 and .18, respectively. The statistical analysis worksheet uses all 32 samples to calculate the mean and standard deviation (.31 and .11), which are the values used as the best estimate of background.

II. **New Jersey DEP Comments.**

1. **Comment:** NRC's unrestricted release limits may not comply with the "proposed" unrestricted release limits for the State of New Jersey when the sum of the fraction method is considered. With ALARA considerations and NRC gamma exposure criteria for unrestricted use, the state's limit likely will be met. NRC should inform the licensee that the state's limits must also be met.

Response: The state's limits are preempted by NRC's limits in accordance with the Atomic Energy Act (AEA), as amended with respect to licensable source material. Therefore, the state's limits do not have to be met with respect to decommissioning of the mill or the monazite pile. However, given the difference between radionuclide concentrations in the monazite pile and natural background concentrations and given that some of the uncontaminated soil beneath the pile will necessarily be scraped up during site cleanup, the soil surface remaining after

removal of the monazite pile will contain radionuclide concentrations within the range of natural background and, therefore, will satisfy state limits and ALARA.

2. **Comment**. Is the NRC going to require a determination of the vertical extent of the residual radionuclides in soil?

Response: HMI knows the process by which the monazite was put in place (i.e., there was no excavation) and, therefore, FSSP surveys after removal of the monazite will satisfy any concerns about the vertical extent of residual radionuclides in the soil. See also the Response 1 above.

3. **Comment**. The blue area should be considered "affected" because monazite was diluted and then disposed there.

Response: The blue area is not "affected" as it does not contain source material (i.e., either uranium, thorium or any combination thereof) at licensable "source material" levels and, therefore, is not subject to NRC's jurisdiction. See SECY-96-207, Update of Policy and Program Issues at SDMP Sites." Sept. 25, 1996 at p. 23.

4. **Comment:** Figure 2 has no indication of north.

Response: A copy of a revised Figure 2 from the RSI FSSP showing an N arrow is attached. Also, please note that the hatching indicating the extent of the NRC areas of interest has been removed from the service building, warehouse, change house and office. The legend *"all other areas NJDEP"* was not clearly defined and the scale being incorrect were removed.

5. **Comment:** In the discussion of outdoor properties, it is stated that all outdoor properties are "unaffected." However, in a letter dated June 16, 1991 from John Kinneman to Dr. Stern, NJDP, there was some mention of an area between the dry mill and wet mill as being contaminated from spilling free sand and monazite. Highest radiation levels were 400 microR/hr. The entire area between the wet and dry mill must be considered "affected."

Response: The area between the wet mill and the dry mill was not contaminated by the spillage of free sand and monazite. The monazite was taken out in the dry mill and put directly in the current monazite pile or in barrels which are now in the pile so the monazite never traveled between the two mills. Additionally, the materials traveling from the wet mill to the dry mill did so in a slurry form through a pipe underground and, therefore, did not contaminate the surface between the two mills. In any event, as noted in Response to Comments to NRC, if any outdoor hotspots exceed 75% of the guideline during the ten percent survey in accordance with NUREG-5849, then the area will be reclassified from "unaffected" to "affected."

6. **Comment:** If monazite was analyzed in the laboratory as a product sample, should the laboratory be considered an "affected" area.

Response: There was no monazite sampling in the laboratory.

7. **Comment:** In Section 6.1, "affected area surveys," what does one hundred percent survey mean? Will a ten-by-ten grid pattern be used, as is recommended in NUREG-5849? If so, this should be stated clearly. If higher readings are obtained, what procedure will be followed to further clarify them.

Response: Samples will be taken on a ten-by-ten grid pattern according to NUREG-5849. The work plan will detail procedures for additional sampling where contamination indications are above release guidelines. When contamination is indicated, grids will be subdivided into four quadrants and resampled in an attempt to localize the contamination. Areas of elevated activity discovered during the scanning survey will be delineated in spray paint to aid in localized remediation.

8. **Comment:** The discussion of representative data is unclear. What does "F" stand for in equation for representativity?

Response: This equation if from "Data Quality Objectives Process for Superfund" EPA/540/G-93/071. F is the number of times a premise the data are intended to show fails. For example, a soil sample are obtained at every area of elevated dose rate. If the premise is a high dose rate indicates soil contamination and one out of ten locations of high dose rate does not yield a contaminated soil sample. The data is considered;

$$1-\frac{1}{10} \times 100\% = 90\% \text{ representative}$$

#649369

SHAW, PITTMAN, POTTS & TROWBRIDGE
A PARTNERSHIP INCLUDING PROFESSIONAL CORPORATIONS

2300 N STREET, N.W.
WASHINGTON, D.C. 20037-1128
(202) 663-8000
FACSIMILE
(202) 663-8007

900 THIRD AVENUE
NEW YORK, NEW YORK 10022-4728

1501 FARM CREDIT DRIVE
McLEAN, VIRGINIA 22102-5000

115 SOUTH UNION STREET
ALEXANDRIA, VIRGINIA 22314-3361

201 LIBERTY STREET, S.W.
LEESBURG, VIRGINIA 22075-2721

ANTHONY J. THOMPSON
(202) 663-9198

December 14, 1998

By Federal Express

Mr. ~~Mark~~ C. Roberts, Chief
U.S. Nuclear Regulatory Commission
Decommissioning and Laboratory Branch
Division of Nuclear Materials Safety
Region 1
475 Allendale Road
King of Prussia, PA 19406-1415

Dear Mark:

Enclosed please find a copy of my letter to you dated November 30, 1998. The attached document to my letter entitled "Figure 2" was incorrect. Therefore, I enclose an accurate copy of "Figure 2." My apologies for any inconvenience this may have caused you.

If you have any questions, please feel free to contact me.

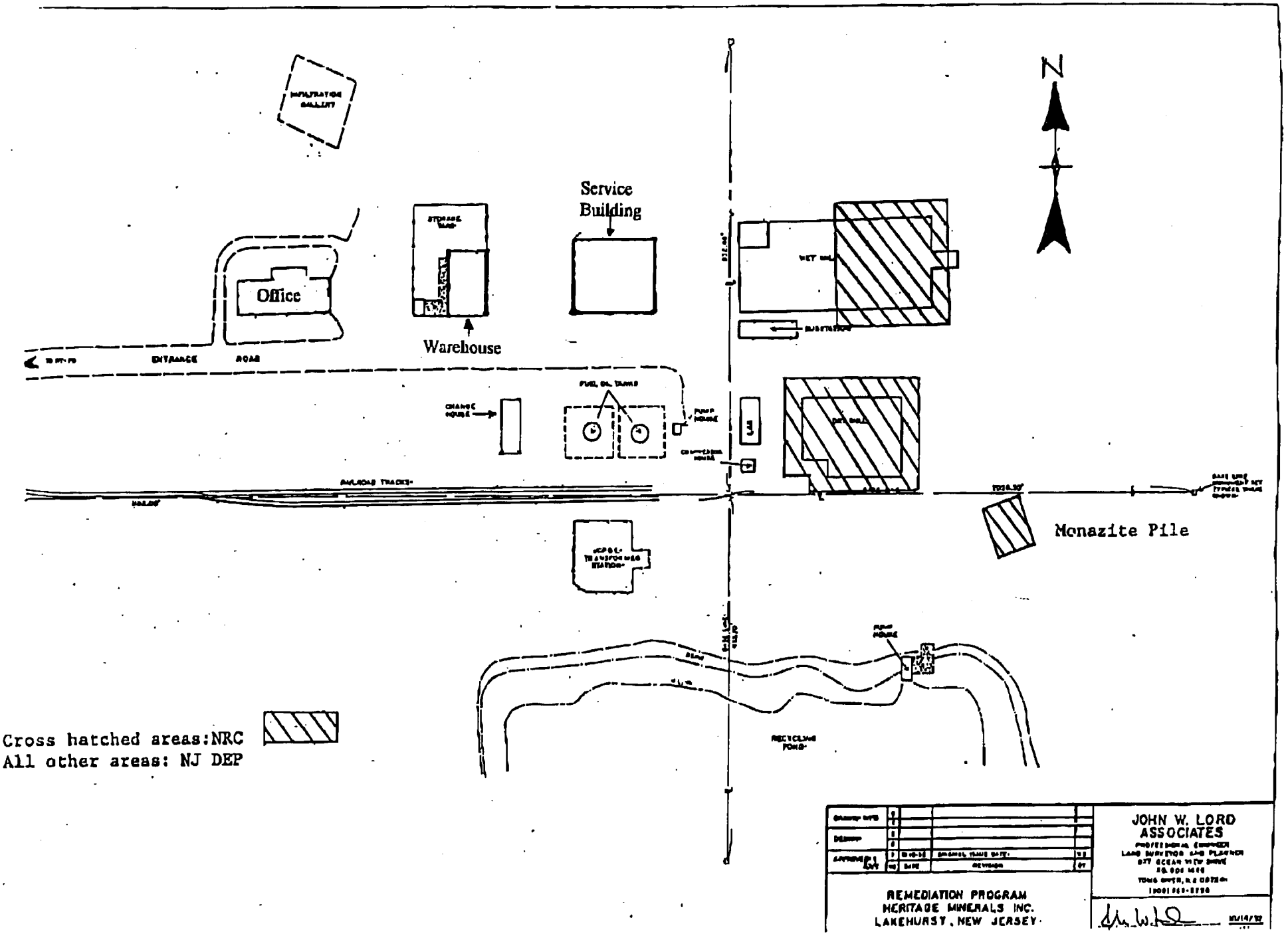
Very truly yours,

Anthony J. Thompson

AJT/cls
Enclosure

Document #: 691248 v.1

FIGURE 2


Service Building
Office
Warehouse
ENTRANCE ROAD
CHANGE HOUSE
RAILROAD TRACKS
Monazite Pile
N
Cross hatched areas:NRC
All other areas: NJ DEP
REMEDIATION PROGRAM
HERITAGE MINERALS INC.
LAKEHURST, NEW JERSEY
JOHN W. LORD ASSOCIATES