

DEPARTMENT OF HEALTH SERVICES**RADIOLOGIC HEALTH BRANCH**

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SACRAMENTO, CA 94234-7320

(916) 445-0931



August 30, 2001

Mr. Paul Lohaus
U.S. Nuclear Regulatory Commission
Office of State and Tribal Programs
Washington, D.C. 20555

01 SEP 12 PM 3:39

OSP

SUBJECT: REGULATION OF SOURCE MATERIAL

Dear Mr. Lohaus:

The State of California, Department of Health Services, Radiologic Health Branch (RHB) has recently been working to license MolyCorp, Inc.'s operations in Mountain Pass, CA, as they relate to the possession and use of source material. MolyCorp mines and processes rare-earth ores containing less than 0.05% source material at their facility, producing refined rare-earth compounds containing greater than 0.05% source material that are purchased by others for further processing or for incorporation into finished commercial products. Several issues have arisen related to the regulation of source material at this facility. We are contacting you for an interpretation of NRC regulations as they would apply to this material.

Our questions relate primarily to issues concerning those exemptions contained in 10 CFR 40.13 for source material that is less than 0.05% by weight uranium or thorium and for rare-earth metals and compounds, mixtures and products containing not more than 0.25% by weight uranium and thorium. Our concerns involve both the regulation of active licenses and the decommissioning of sites contaminated by the materials referenced above. Thus, we are also seeking an interpretation of your regulations in 10 CFR 20, Subpart E, as they relate to decommissionings. Finally, in order to provide you with the background information motivating our inquiry, we have attached a copy of a March 2001 position paper, entitled "Regulatory Oversight of the MolyCorp, Inc. Mountain Pass Facility with Respect to Radionuclides," prepared and presented to RHB by MolyCorp, Inc. We have also attached our July 20, 2001 response to the MolyCorp position paper.

The regulation in 10 CFR 40.13(a) exempts any person from licensure, where they receive, possess, use, transfer or deliver source material, in which the source material by weight is less than one-twentieth of one percent (0.05%). Likewise, 10 CFR 40.13(b) exempts unprocessed ore regardless of the source material content. However, it is our understanding from discussions with NRC staff members, and the review of publicly available NRC documents, that the NRC may extend control over material that is less

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than 0.05% by weight source material at facilities such as rare-earth sites that are licensed to possess material that is greater than or equal to 0.05% by weight source material.

Given the preceding, RHB has the following questions:

1. Does NRC exert authority (and if so, what is the regulatory basis for such authority) at facilities such as rare-earth licensed sites (licensed for the possession of source material) over source material that is being processed but that is less than 0.05% by weight uranium and thorium, or does the regulatory control only begin once the material has been processed to the point that the concentration of the uranium or thorium is above 0.05% by weight?
2. Does NRC exert regulatory authority (and if so, what is the regulatory basis for such authority) at facilities such as rare earth licensed sites over tailings and other wastes if the source material content of the tailings or other wastes is less than 0.05% by weight? What if those tailings or other wastes reconcentrate (e.g., by evaporation) to greater than 0.05%? In your response, please consider tailings that emanate from the process both before and after the process reaches the 0.05% by weight source material concentrations, and situations where the tailings or other wastes are maintained separate, and situations where the tailings or other wastes are commingled.
3. Under what circumstances, and regulatory authority, does NRC exert jurisdiction over radium, particularly at facilities such as rare earth processing facilities.

The regulation in 10 CFR 40.13(c)(1)(vi) provides that persons are exempt to the extent that they receive, possess, use or transfer rare-earth metals and compounds, mixtures and products containing not more than 0.25% uranium and thorium. The NRC's Health Physics Position, No. 29 discusses this exemption, concludes that the items referred to in 10 CFR 40.13(c)(1)(vi) are "finished commercial products of the rare earth refining process," and states that the exemption does not apply to "raw material (e.g., for ores or concentrates used as raw material)," nor to radioactive waste resulting from the processing of these materials.

With respect to this exemption, and the NRC's subsequent interpretation, RHB has the following questions:

4. How does the NRC interpret the phrase "finished commercial products?" Does it include, for example, bulk quantities (2,000 lbs or more) of rare-earth compounds, irrespective of the future use of the material, or does it only refer to the finished commercial products that incorporate the rare-earth compounds? For example, if Molycorp distributes a bulk quantity of rare-earth compounds to a facility that will then further process the material for the extraction of a particular rare-earth for a different customer, was Molycorp's initial product a "finished commercial product" for the purposes of the exemption contained in 10 CFR

40.13(c)(vi)? Are there circumstances under which Molycorp's products would be considered "finished commercial products" given they are incorporated into other products before reaching consumers?

The regulations in 10 CFR 20.1402 contain criteria for the unrestricted release of licensed sites, and in 10 CFR 20.1403 provide criteria for the restricted release of licensed sites. Guidance documents relevant to the implementation of these criteria indicate that site-specific parameters should be used when projecting future doses from residual contamination at these sites, but there is no clear guidance regarding when a "site specific condition" is, in fact, a "restriction." To further clarify RHB's specific concerns, we have the following questions:

5. If a site has residual contamination located from two to four meters below grade, and the existing cover is necessary to reduce doses to below the 25-mrem/year criterion, would an unrestricted site release be appropriate? Similarly, if the residual contamination were under two to four meters of placed (i.e., not naturally-existing) cover, under the same dose circumstances, would an unrestricted site release be appropriate?
6. Which of the specific parameters contained in the RESRAD code, if changed from their default values to less conservative site-specific parameters, would imply a restricted as opposed to an unrestricted site release?
7. How is the release of a site, using site-specific parameters that are less conservative than the default parameters, justified in light of the fact that once the site is released, the residually-contaminated soil may be physically removed from the site and transferred to another site with wholly different site-specific conditions? (This question is not hypothetical, but is based on actual transfers of residually-contaminated soil in California.)

We have the following additional question concerning decommissioning criteria specific to rare-earth facilities, or other facilities using source material, but not processing the material primarily for its uranium or thorium content:

8. What are the appropriate decommissioning criteria for the following types of source materials at the facility:
 - a. processed product at greater than 0.05% by weight concentrations,
 - b. processed product at less than 0.05% by weight concentrations,
 - c. tailings or other wastes at greater than 0.05% by weight concentrations, and
 - d. tailings or other wastes at less than 0.05% by weight concentrations?

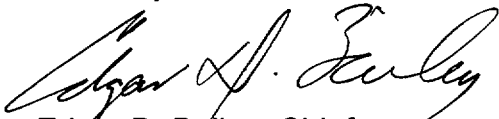
Finally, we understand that the NRC currently requires NRC source material licensees to request approval from the NRC before transferring material that is less than 0.05%

source material to persons exempt. Based on various NRC documents¹, it appears that approval is expected to be granted whenever the projected dose from the final disposition of the material is less than 100 mrem in a year.

9. How is this policy, based on a 100-mrem/year criterion, consistent with the decommissioning rule? (For instance, what would prevent transfer of large quantities of soil or water contaminated with source material with a 100 mrem/year dose criterion instead of release in place under the decommissioning rule with a 25-mrem/year criterion?)

Thank you for your consideration of these issues. We would appreciate your timely response due to a pending licensing action at the MolyCorp facility. The technical contact for this issue is Ms Barbara Hamrick (714)257-2031.

Sincerely,



Edgar D. Bailey, Chief
Radiologic Health Branch

Attachments: As stated

¹ See, for example, "Staff Requirements – SECY-98-284 – Transfers of Material Containing Less Than 0.05 Percent by Weight Source Material under 10 CFR 40.51(b)(3) and (b)(4), and 40.13(a)," dated February 2, 1999, and also see, "Staff Requirements – SECY-99-259 – Exemption in 10 CFR Part 40 for Materials Less Than 0.05 Percent Source Material – Options and Other Issues Concerning the Control of Source Material," dated March 9, 2000.

**DEPARTMENT OF HEALTH SERVICES****RADIOLOGIC HEALTH BRANCH**

P.O. BOX 942732, MS-178
SACRAMENTO, CA 94234-7320
(916) 445-0931

July 20, 2001

Allen C. Randle
Vice-President, Lanthanide Group
Molycorp, Inc.
67750 Bailey Road
Mountain Pass, CA 92366

**SUBJECT: RESPONSE TO MOLYCORP'S REGULATORY POSITION PAPER
(MARCH 2001); AND EXTENSION TO THE RADIOACTIVE MATERIALS LICENSE
APPLICATION.**

Dear Mr. Randle:

The California Department of Health Services, Radiologic Health Branch (the Department) has reviewed your March 2001 submission entitled, "Regulatory Oversight of the Molycorp, Inc. Mountain Pass Facility with respect to Radionuclides." In the executive summary of your March 2001 submission, you concluded that "the State does not have jurisdiction to regulate (1) the ore through the various phases up to being placed in the drum filter, (2) tailings generated during flotation and the associated tailings impoundments, and (3) any and all final products." While we agree in part with your analysis regarding our jurisdiction over material used and processed at the Molycorp, Inc. Mountain Pass facility ("Molycorp"), we generally disagree with your conclusions.

Initial Point of Regulation

With respect to your position that the "ore through the various phases up to being placed in the drum filter" is outside of our regulatory jurisdiction, the Department notes that although, under California regulations, CCR, title 17, section 30180(c)(1), naturally occurring radioactive materials in concentrations which occur naturally are exempt from licensing requirements, the exemption does not apply when the material is being processed or refined. So, the exemption is not valid either where the concentrations of naturally occurring radioactive material are greater than those that occur naturally, or the material is being processed or refined. The Department has inherent authority under its police powers to regulate the radiological hazards associated with these



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materials. The Department has determined that based on the above, the initial point of regulation will be the crushing/screening plant.

Regulation of Impoundments

With respect to your position that "tailings generated during flotation and the associated tailings impoundments" were outside of our regulatory jurisdiction, the Department notes your arguments over exemptions stated in regulations but also notes additional requirements stated in California law that take precedence. The California Health and Safety Code, section 114715 requires that "No person shall bury, throw away, or in any manner dispose of radioactive wastes within the state except in a manner and at locations as will result in no significant radioactive contamination of the environment." Waste streams at the Mountain Pass facility are known to have radioactive constituents that could result in significant radioactive contamination of the environment. The sampling data Molycorp provided for P-1 and P-16 impoundments does not provide an adequate basis for excluding them from licensure.

If this type of disposal is to continue, it must first be authorized under a radioactive materials license and meet the standards stipulated under the license. Since the tailings have radiological constituents that are substantially similar from a health and safety perspective to those regulated under title 10 of the Code of Federal Regulations, Part 40 (10 CFR 40), Appendix A, your license application must include a description of the criteria that will be used for new tailings ponds, cells, etc., which must be comparable to the 10 CFR 40, Appendix A guidance, in that it needs to achieve the same protective goals. With respect to old impoundments, the Department also intends to address the disposition of both the Old and New Ivanpah Evaporation Ponds for their radiological constituents, as well as all other active and inactive impoundments at the Molycorp Mountain Pass site. Their disposition may be addressed as a part of the current license application or by separate regulatory action. The Department will be available to address this matter in more detail at the July 26, 2001 meeting.

Regulation of Products

With respect to your position that "any and all final products" were outside of our regulatory jurisdiction, the Department would like to call Molycorp's attention to the NRC's Health Physics Position, No. 29 (HPPOS-029, available at <http://www.nrc.gov/NRC/NMSS/HP/POS/hppos029.txt>), that contradicts Molycorp's contention that the "0.25% exemption" also includes manufacturing. This position statement addresses a 1982 inquiry by Molybdenum Corporation of America, regarding the 0.25% exemption in the NRC regulations. The position restates the NRC's Office of



Executive Legal Director's opinion that the 0.25% exemption does not apply to incoming ore or to waste streams, and that items referred to in the NRC's 0.25% exemption are finished commercial products.

The Department does not intend to exercise jurisdiction over any and all finished commercial products, as the NRC interprets that term. At this point in time, the Department has not determined whether or not Molycorp's products must be distributed to persons specifically or generally licensed or may be distributed to persons exempt. If it is determined that Molycorp's products may be distributed to persons exempt, then Molycorp's license application must include procedures that will demonstrate on a routine basis that their products meet the criteria necessary for their distribution to persons exempt from licensure.

Application Extension

A preliminary review of Molycorp's initial Radioactive Materials License application was performed in July 2000. The Department's letter to Molycorp dated August 15, 2000 stated that the license application did not provide:

- 1) A complete legal description of all property holdings (e.g., owned, leased, permitted use authorizations, etc.);
- 2) A disclosure and description of all evaporation, product, storage, waste, and other ponds (whether closed or still in use); and
- 3) A complete written radiation safety program, which include procedures of appropriate depth and scope for the use of radioactive material at your facility.

Based on previous discussions in this letter, it is the Department's position that Molycorp's license application must:

- 1) Encompass activities beginning at the initial point of beneficiation, (i.e., the crushing /screening plant).
- 2) Include tailings generated during flotation as well as the associated tailings impoundments, all evaporation ponds and all product ponds, unless their exclusion is otherwise satisfactorily demonstrated; and

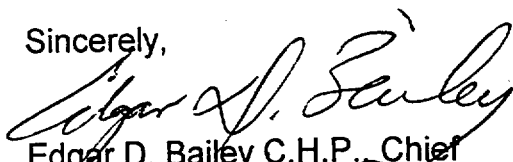
Allen C. Randle
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- 3) Include procedures to demonstrate that Molycorp's products may be distributed to persons exempt from licensure, if such distribution is found by the Department to be appropriate and in compliance with NRC standards.

The response to our letter dated August 15, 2000 will be expected within 45 days of our scheduled July 26, 2001 meeting which will address Molycorp's March 2001 submission.

If you have any questions, contact Franklin Mark at (916) 324-6982.

Sincerely,


Edgar D. Bailey C.H.P., Chief
Radiologic Health Branch

cc: David Wesley, C.H.P.
Robert Greger, C.H.P.
Mike Lombard, Senior Counsel
Frieda Taylor
Steve Hsu
Barbara Hamrick
Ronald Rogus, Ph.D.
Franklin Mark
Jeffrey Wong



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www.consumerenergycenter.org/flex/index.html

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Molycorp

Allen C. Randle
Vice President, Lanthanide Group

March 5, 2001

Edgar D. Bailey, CHP, Chief
Department of Health Services
Radiological Health Branch
P.O. Box 942732, MS-178
Sacramento, CA 94234

REGULATORY OVERSIGHT POSITION PAPER

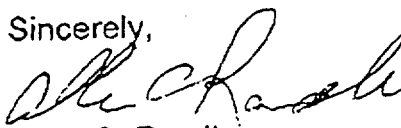
Dear Mr. Bailey:

In response to issues and concerns raised by your staff at a meeting between Radiological Health Branch on January 10, 2001, enclosed is a position paper regarding State of California Regulatory Oversight with respect to radionuclides.

In order to discuss this document and move forward with our radiological materials license, Molycorp requests that a meeting with yourself and staff be scheduled at the earliest available time.

If you have any questions, please contact Bill Sharrer at (760) 856-7604.

Sincerely,



Allen C. Randle

cc: Kevin Krenzien, Molycorp, Inc.
William Sharrer, Molycorp, Inc.
Barbara Hamrick, Radiologic Health Branch
Frieda Taylor, Radiologic Health Branch
David Wesley, Radiologic Health Branch

**REGULATORY OVERSIGHT OF THE MOLYCORP, INC.
MOUNTAIN PASS FACILITY
WITH RESPECT TO RADIONUCLIDES**

Submitted to:

**California Department of Health Services
Radiologic Health Branch
P.O. Box 942732, MS-178
Sacramento, CA 94234**

Prepared by:

**Molycorp, Inc.
Post Office Box 124
Mountain Pass, California 92366**

March 2001

EXECUTIVE SUMMARY

Molycorp, Inc. operates a mining and mineral recovery facility, at Mountain Pass, located in northeastern San Bernardino County, California. The purpose of this position paper is to express Molycorp's view regarding the State of California's authority, under the Atomic Energy Act and under its inherent authority as articulated in the California Health and Safety Code and implementing regulations, to regulate radioactive materials and associated activities at the facility. In an effort to resolve the licensing and regulatory issues surrounding the radioactive materials at the facility, at this time, - Molycorp proposes that Radiologic Health Branch of the Department of Health Services license as source material under the Atomic Energy Act facilities and materials from the time the partially recovered ore is placed into the drum filter up to formation of the final products. It is Molycorp's position that the State does not have jurisdiction to regulate (1) the ore through the various phases up to being placed in the drum filter, (2) tailings generated during flotation and the associated tailings impoundments, and (3) any and all final products.

I. INTRODUCTION

Molycorp, Inc. operates a mining and mineral recovery facility, at Mountain Pass, located in northeastern San Bernardino County, California. The site is located 15 miles southwest of the California-Nevada state line along Interstate 15 (I-15), in the Clark Mountain Range, at an elevation of approximately 4,800 feet above mean sea level (msl).

Since 1997, Molycorp has been in discussions with the California Department of Health Services, Radiologic Health Branch ("RHB") regarding the Department's jurisdiction to regulate radioactive materials present at the Mountain Pass Facility. - Molycorp has prepared this position paper to clarify its position regarding RHB's authority, under both the Atomic Energy Act and the State police powers, as manifested in Part 9 "Radiation" of the California Health and Safety Code and Title 17, Public Health, Division 1, Department of Health Services, Chapter 5, Subchapter 4, Radiation, of the California Code of Regulations, to license and regulate the various Mountain Pass materials and activities involving radioactive materials.

First, this paper details operations at the Mountain Pass facility including mining, mineral recovery, and tailings management. Second, it details Molycorp's views on the nature and extent of RHB's regulatory authority over the various activities and radioactive materials at the site.

II. BACKGROUND ON THE MOUNTAIN PASS FACILITY: MINING, MINERAL RECOVERY, AND TAILINGS

A. Mining Operations

Mountain Pass is the only mine in the Western Hemisphere that produces lanthanide concentrates and pure individual lanthanide products. The term lanthanides are a group of 15 elements (atomic numbers 57-71), which are similar in their ability to form specific, unusual chemical and physical components. These elements are commonly referred to as "rare earths" because of their "dirt-like appearance," and because they are widely dispersed in nature in very low concentrations. This family of elements is more abundant on a worldwide average basis than copper, zinc, and tin, but it is extremely rare to find high concentrations of the elements in any one location.

At the Mountain Pass Mine, the average lanthanide concentration in the ore body is 8%, which is 400 times the world's average lanthanide concentration. The next highest known concentration of lanthanide elements is just under 1% in a deposit associated with iron ore mined and produced in China.

Major uses for the lanthanides include the following strategic and industrial applications:

- Environmental Protection
- Electronics including video displays
- Communications
- Automotive
- Aircraft
- Glass and Ceramics
- High-field-strength Magnets

A brief discussion of the development of the site is provided below.

The Clark Mining District, which includes the Mountain Pass area, was first developed in 1865 primarily for silver mining. Between 1900 and 1920, many small lead, zinc, copper, gold and tungsten mines were started and some production was recorded. The Sulphide Queen gold deposit, which is located adjacent to the Mountain Pass ore body, was discovered in 1936. A 100-ton cyanide plant was built to service the deposit but only small amounts of gold were produced.

Although considerable mineral exploration in the Clark Mountain area occurred prior to 1949, the presence of lanthanides was not suspected until Herbert Woodward discovered a heavy, light-brown mineral on mining claims located nearly a mile north of the Sulphide Queen gold mine. The U.S. Bureau of Mines later identified the mineral as bastnasite, a fluoro-carbonate of the cerium group of rare earth (lanthanide) elements. Later the U.S. Geological Survey ("USGS") confirmed the identification of bastnasite, as the major lanthanide mineral. Following this confirmation, USGS began geological mapping of the so-called "Birthday" claims in November 1949 and a public announcement was made by the Secretary of the Interior.

In 1950 and 1951, Molybdenum Corporation of America (Molycorp) optioned the Birthday claims in anticipation that the claims contained a commercially viable domestic source of lanthanide elements. Following various exploratory efforts, titles were obtained for a high-grade ore body identified in an outcrop to the southwest, averaging 5 to 8 percent lanthanide elements.

To harness the lanthanide elements, a concentrating plant was constructed and began operation in February 1952. Flotation extraction began in January 1953, and later that year a water pipeline from Ivanpah Valley was put into service. The tailings from these operations were deposited in a pond south of the mine (P-1). In 1965, as a result of an increase in demand for europium as a red phosphor for color television, a new Europium Plant was constructed. Also that year, construction of a new concentrating plant began and the Lahontan Regional Water Quality Control Board ("LRWQCB") established waste discharge requirements for the onsite tailings pond, P-1. A new tailings facility, the North Tailings Storage Area (P-16), was constructed in 1967.

The lanthanide ore body at the Mountain Pass Mine contains about 40 percent calcite, 25 percent barite and/or celestite, 10 percent strontianite, 8 percent bastnasite, 8 percent silica, 3 percent monazite, and minor amounts of apatite, galena, and hematite. Bastnasite is tan to yellow-brown in color and generally occurs in tabular hexagonal crystals flattened on the base. In high-grade veins, such as those found on the Birthday claims, some crystals are as much as four inches in length while in the Sulphide Queen body, they are usually less than one-eighth of an inch long. The Bastnasite ore body contains 14 lanthanide elements including cerium, lanthanum, praseodymium, neodymium, samarium, europium, and gadolinium. In addition to the lanthanides, the ore contains trace concentrations of uranium and thorium.

Uranium, thorium, and the radioactive isotope of potassium are ubiquitous in the earth's crust. Since these elements have been present since the formation of the earth, they are called "primordial" radionuclides. On average, uranium is present in the earth's crust at a concentration of 2 to 4 parts per million (ppm), or 1 to 2 pCi/g.¹ The average crustal thorium concentrations range from 2 to 20 ppm, or <1 to 2 pCi/g. the radioactive isotope of potassium, potassium-40, is present at approximately 2 to 8 ppm, or 14 to 50 pCi/g. The concentrations of the primordial radionuclides vary significantly among minerals and between regions. This variability has to do with the original physical-chemical operations that occurred during solidification of the earth's crust, and to later movement and interaction of the continental plates.

Moreover, rare earth ores are not unique in being associated with uranium and thorium concentrations. For example, vanadium, molybdenum, titanium, zinc, and zirconium ores are known to be associated with elevated concentrations of such naturally occurring radionuclides, including uranium and thorium². Phosphate deposits contain above-average uranium and radium concentrations -- concentrations of uranium and radium can range up to 80 pCi/g and 20 pCi/g, respectively, in phosphate fertilizers. Natural monazite sands may contain 4 percent thorium (4400 pCi/g), and elevated uranium concentrations.

For comparison purposes, the U.S. Environmental Protection Agency ("EPA") estimates that the approximately 100 million metric tons of phosphate wastes with elevated radium concentrations are generated per year. In addition, EPA estimates metal mining and processing produces over one billion metric tons per year of waste with elevated radium concentrations, primarily from large volume industries such as copper and iron production.³

¹ National Council on Radiation Protection and Measurements (NCRP). 1987. Exposure of the Population in the United States and Canada from Natural Background Radiation, NCRP Report No.94. National Council on Radiation Protection and Measurements. Bethesda, MD.

² National Council on Radiation Protection and Measurements (NCRP). 1993. Radiation Protection in the Mineral Extraction Industry, NCRP Report No. 118. National Council on Radiation Protection and Measurements. Bethesda, MD.

³ U.S. Environmental Protection Agency (EPA). 1993. DRAFT. Diffuse NORM Wastes -- Waste Characterization and Preliminary Risk Assessment. RAE-9232/1-2. May 1993.

Footnote continued on next page

B. Mineral Recovery Activities

The following section summarizes the Mountain Pass mineral recovery operations at each onsite facility under normal operating conditions. Bastnasite ore undergoes numerous mineral beneficiation or recovery operations to produce rare earth products of various purities.

1. Crushing/Screening Plant

Following removal from the mine pit, the native ore, which contains less than 0.05% source material and radium in natural equilibrium with its atomic parents at background levels for the ore⁴, is sent to the Crushing Plant. The Crushing Plant is a three-stage unit consisting of a primary jaw crusher, a secondary hydrocone crusher, and a tertiary vertical rock-on-rock crusher. The ore is transported to the primary crusher feed stockpile by heavy equipment. A front-end loader is used to select feed from the stockpile area for placement into the crusher feed hopper. Management of the feed rate from the stockpiles produces mill feed blended to a uniform ore grade (minus 3/8 inch).

2. Mill/Flotation Plant

The minus 3/8 inch mill feed is conveyed to the Mill/Flotation Plant where grinding with a ball mill produces a minus 100-mesh product. The discharge from the ball mill is prepared for flotation in four hot conditioning stages where reagents are added. After conditioning, the feed slurry is pumped to the flotation circuit consisting of "rougher" and "cleaner" flotation cells. In the cells, bastnasite is separated from other materials and then sent to a thickener while the bulk of the tailings material resulting from this operation is pumped to tailings pond P-16. The thickener under flow containing the bastnasite is sent to either a mild hydrochloric acid leach that dissolves carbonate gangue or is used as an unleached concentrate. Both leached and unleached bastnasite are filtered at a drum filter where the *combined* concentration of uranium and thorium exceeds 0.05 percent for the first time. Both leached and unleached bastnasite are sold as product. Typically, during full scale plant operations twenty percent of the bastnasite concentrate is packaged and sold while 80 percent of the concentrate is fed to the Separations Plant via bulk trucks.

The milling and flotation operations involve wet slurries and, therefore, do not generate particulate air emissions. The packaging, drying, and bulk storage bins are vented to permitted baghouses for dust control.

Footnote continued from previous page

⁴ Rogers & Associates Engineering Corporation. *Radiological Characterization of Materials Streams, MolyCorp Facility at Mountain Pass, California*. RAE-9143/10B-1. November 1998.

3. Separations Plant

As a result of the complexity of the ore, beneficiation of specific lanthanides must be undertaken in a series of steps. Initial concentration is performed in the Flotation Plant where a bastnasite concentrate is produced. This concentrate was fed to the Separations Plant where a further separation of the lanthanides from remaining gangue materials occurs. Various high-purity lanthanide oxide and carbonate products were generated at the Separations Plant including europium, lanthanum, cerium, and neodymium.

4. Specialty Plant

The Specialty Plant was built in 1980-81 for production of samarium oxide and gadolinium oxide. Since that time, the Specialty Plant has been converted to other uses because production of samarium and gadolinium is not currently economically viable. There were three major products manufactured at the Specialty Plant: co-precipitated yttrium/europium oxide, yttrium oxide and neodymium oxide. Other products manufactured at the Specialty Plant involved further recovery of various Mountain Pass Facility products. These included various lanthanide nitrate solutions, lanthanide acetate solutions, and flaked lanthanide chlorides.

Currently, only the mine and mill/flotation plant are operating. Operations at the separation and specialty plant were discontinued in March 1998. Therefore, all of the bastnasite concentrate being produced is being packaged and sold. Molycorp plans to restart the Separations and Specialty plants within the next two - three years. In anticipation of the resumption of full operations at the facility, and in an effort to devise a comprehensive licensing program for the facility, Molycorp is addressing at this time licensing and regulatory issues involving the temporarily ceased activities.

C. Tailings Facilities & Materials

The following presents a general description of the current and proposed tailings disposal facilities at the Mt. Pass operation. Locations of these facilities are shown in Figure 1.

1. Pond P-1

Pond P-1 is located in the southwestern portion of the Molycorp property and is approximately 14 acres in size. The pond was constructed in 1966, and was used until 1985 for the disposal of flotation tailings and the periodic disposal of separations plant wastewater. It was constructed as an unlined earthen pond with containment provided by a fill embankment on the downgradient (south), east and west sides. The existing earthen embankment was raised in the late

1970s by 15 to 20 feet to its present crest elevation of 4,750 feet.⁵ P-1 has not received tailings materials since 1985 and is scheduled for final closure later this year.

In 1995, P-1 was characterized for radiological and metal constituents in order to identify relevant closure requirements.⁶ The radiological constituents are summarized in Table 1, Exhibit A. As indicated in the Table, the maximum measured concentrations of Th-232 and its decay products, Th-228, Ac-228 and Tl-208, indicate a mass thorium concentration of 0.03 percent, well below the threshold for "source material." The average thorium mass concentration, based on the P-1 measured activity concentrations, is approximately 0.01 percent in Area I of P-1 (main tailings area) and 0.01 percent in Area II of P-1 (pond closure materials). The average thorium mass concentration in Area III (north canyon area) of P-1 is 0.008 percent.

Concentrations of uranium and its decay product, Ra-226, are only slightly elevated above local background levels throughout the tested areas of P-1 and are below background levels for the ore. However, a mass concentration of uranium, based on the average U-238 activity concentration, that is approximately 0.001 percent or 10 parts per million (ppm). This concentration is within the range of world-wide background levels. Analysis of P-1 tailings area samples indicates that concentrations do not vary significantly with depth.

2. Pond P-16

The P-16 tailings impoundment is located in the northern portion of the mine property. The impoundment was formed by construction of a rock starter dam followed by a series of upstream raises placed over sand tailings. The tailings dam is currently constructed to an elevation of 4,950 feet above mean sea level. Closure of P-16 will consist of grading the impoundment to provide a surface that promotes surface water run-off and accommodates anticipated long-term settlement. A cover system will be constructed to function as an infiltration barrier over the underlying tailings. The cover system will be designed and constructed to meet or exceed the California Code of Regulations (CCR) Title 27 requirements.⁷ Recently, pursuant to a permit issued by LRWQCB, liners are being placed under portions of the P-16, which will permit Molycorp to continue to use P-16 for two additional five-month mill runs over the course of the next two years.

⁵ Environmental Solutions, Inc. Closure and Postclosure Maintenance Plan, West (Old) Tailings Pond, P-1, Mountain Pass Mine, Volume 1. August 1995.

⁶ *Id.*

⁷ TRC. *Report of Waste Discharge for East Tailings Facility, Volume 1.* December 1998.

The tailings in P-16 were derived from ores similar to those from which the P-1 tailings were derived. In 1997, Rogers & Associates Engineering Corporation radiologically characterized Molycorp material streams.⁸ The sample collected at the final tailings sump indicates U-238 concentrations of ~0.001 percent and Th-232 concentrations of ~0.01 percent. Thus, the P-16 tailings radiological concentrations do not vary significantly from the P-1 values.

3. East Tailings Facility

The proposed east tailings facility will cover approximately 175 acres in Farmer's Wash. The facility is sited in a drainage area with a favorable shape for the storage of tailings. The embankment is a compacted rock fill structure and will be constructed in stages using the downstream construction method. An impoundment lining system will cover the active impoundment area and the upstream face of the impoundment. The proposed lining system incorporates a composite (geomembrane and Geosynthetic Clay Liner) upper liner, underlain by a high capacity geonet/geotextile composite drainage layer, which in turn overlies a single geometric bottom liner. The geomembrane layers will be High Density Polyethylene. The lining system will meet the requirements of CCR Title 27 for engineered alternatives to the prescriptive liner.⁹

Given this background information, the following presents in detail Molycorp's position of the State's regulation of the Mountain Pass Facility.

III. STATE OF CALIFORNIA'S REGULATORY OVERSIGHT OF RADIOLACTIVE MATERIALS AT THE MOUNTAIN PASS FACILITY

The State of California has two sources of authority to regulate radioactive materials. First, it has authority as a so-called Agreement State under the Atomic Energy Act ("AEA" or the "Act") to regulate source, special nuclear, and byproduct material. Second, it has inherent authority under its police power, as reflected in the California Health and Safety Code and its implementing regulations, to regulate materials not covered by the Atomic Energy Act, such as naturally occurring radioactive materials and technologically enhanced naturally occurring radioactive materials ("NORM" and "TENORM").¹⁰ Thus, the State has AEA and non-AEA authority over radioactive materials and the two are not co-extensive as a result of AEA preemption with respect to certain clearly defined AEA materials and broader State authority with respect to non-AEA radioactive materials. These sources of authority are respectively

⁸ Rogers & Associates Engineering Corporation. *Radiological Characterization of Materials Streams, Molycorp Facility at Mountain Pas, California*. RAE-9143/10B-1. November 1998.

⁹ TRC. *Report of Waste Discharge for East Tailings Facility, Volume 1*. December 1998.

¹⁰ Although uranium and thorium are naturally occurring radioactive materials as discussed *supra*, they are not included in materials denoted as NORM and TENORM subject to States' non-AEA authority.

discussed in sections A and B. Following this general discussion, we address in section C the application of the State's authority to the Mountain Pass Facility specifically.

A. Scope of The State's Regulatory Authority Over Materials Regulated Under the Atomic Energy Act

1. State's Authority Under the Atomic Energy Act

The Atomic Energy Act provides the statutory authority for the Nuclear Regulatory Commission ("NRC" or "Commission") to regulate certain types of enumerated radioactive materials: source,¹¹ special nuclear¹² and byproduct material.¹³ See, 42 U.S.C. § 2201. The courts have firmly established that NRC's jurisdiction over the licensing and the radiological health and safety aspects of these materials preempts all state regulation in these areas.¹⁴

Since the authority provided by the AEA is material-based (i.e., since it extends only to source, special, nuclear, and byproduct material), NRC licensing requirements and clean-up standards can apply only to activities involving those types of materials. Put another way, the authority provided by the AEA does not extend, and NRC's licensing requirements cannot apply, to activities that are *not* associated with source, special nuclear or byproduct materials. Accordingly, the precise definitions of these jurisdictional terms, and their proper and consistent interpretation, are critical in understanding the scope of the authority granted by the AEA to regulate activities at the Mountain Pass Facility.

Molycorp does not use, process or possess any special nuclear material, nor does it have any 11e.(1) or 11e.(2) byproduct material that would be the subject of current licensing discussions with RHB.¹⁵ However, in some parts of the facility there

¹¹The AEA defines source material as "uranium, thorium, or any other material which is determined by the Commission . . . to be source material; or (2) ores containing one or more of the foregoing materials, in such concentration as the Commission may by regulation determine from time to time." 42 U.S.C. § 2014(z).

¹²Special nuclear material is "(1) Plutonium, uranium enriched in the isotope 233 or in the isotope 235, and any other material which the Commission . . . determines to be special nuclear material; or (2) any material artificially enriched by any of the foregoing, but does not include source material." 42 U.S.C. § 2014(aa).

¹³Under the AEA, there are two types of byproduct material. First, so-called "*11e.(1) byproduct material*" is radioactive material "yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material." 42 U.S.C. § 2014(e)(1). Second, "*11e.(2) byproduct material*" is "the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content." 42 U.S.C. § 2014(e)(2).

¹⁴ See, e.g., *Pacific Gas and Electric Co. v. State Energy Resources Conservation and Development Comm'n*, 461 U.S. 190 (1983); *Kerr-McGee Chemical Corp. v. West Chicago*, 914 F.2d 820, 825 (7th Cir. 1990); *Brown v. Kerr-McGee Chemical Corp.*, 767 F.2d 1234, 1240-41 (7th Cir. 1985).

¹⁵ Molycorp does possess some sealed byproduct material in gauges. These materials are regulated under an existing license.

are substances that may fall within the definition of "source material" and that may be subject to licensing. Therefore, a proper understanding of the definition of "source material" under the AEA and applicable California regulations is critical to a determination of whether the various Molycorp materials come under the jurisdictional authority granted by the AEA.

California is an Agreement State pursuant to section 274 of the AEA.¹⁶ The AEA permits NRC to agree with individual states to cede the authority provided to NRC by the Act over source, special nuclear and byproduct material. See, 42 U.S.C. § 2021(b). The California Department of Health Services licenses the use of radioactive material in California under the "Radiation Control Law," Health and Safety Code, Section 114960-115271.4. The applicable California regulations are given in Title 17, Public Health, Division 1, Department of Health Services, Chapter 5, Subchapter 4, Radiation, of the California Code of Regulations. The California regulations for implementing its responsibilities as an "Agreement State," in accord with the AEA, are also given in 17 CCR Chapter 5.

An Agreement State's authority to regulate the materials defined in the AEA (and an Agreement State's authority to regulate the radiological health and safety aspects of those materials) is coextensive with NRC's authority.¹⁷ That means that California's Agreement State authority to license and regulate *source material* extends just as far and only as far as the NRC jurisdiction ceded to the State. As such, California cannot use its authority under the AEA to extend its own jurisdiction over source material beyond the scope of jurisdiction over that material as defined specifically by the statute and as interpreted by the Commission. In other words, the AEA does not give California permission to interpret the definition of source material, and its exemptions, in a way as to reach a broader range of materials than would be subject to regulation as source material by NRC.

2. Scope of Agreement State Authority Under AEA

As stated above, an Agreement State's authority under the AEA is coextensive with NRC and an Agreement State's radiation control program must be compatible with NRC's program. In its Agreement with NRC, the State of California agreed to "use its best efforts to maintain continuing compatibility between its program and the program of the Commission for the regulation of like materials."¹⁸ In 1997, the NRC adopted a

¹⁶ Notice of Agreement With the State of California, 27 Fed. Reg. 3864 (April 21, 1962).

¹⁷ Note that Molycorp's Mountain Pass facility is not a nuclear fuel cycle facility. Because the AEA does not provide jurisdiction over mining, the Commission has been careful about intruding into an activity over which it has (and seeks) no authority. As noted by the former Commissioner of the NRC in testimony before Congress, the Commission proposed the language in the definition of 11e.(2) byproduct material "to avoid bringing within NRC jurisdiction radioactive wastes resulting from activities not connected with the nuclear fuel cycle" *Kerr Mc-Gee v. U.S. Nuclear Regulatory Commission*, 903 F.2d 1, 6 (D.C. Cir. 1990).

¹⁸ 27 Fed. Reg. 3864.

Policy Statement on Adequacy and Compatibility of Agreement State Programs.¹⁹ According to the policy statement, an Agreement State's radiation control program is considered to be compatible with NRC regulations if it "does not create conflicts, duplications, gaps, or other conditions that would jeopardize an orderly pattern in the regulation of agreement material on a nationwide basis." 62 Fed. Reg. 46524.

With regard to the degree to which a state must conform to specific provisions of federal requirements, NRC has provided that the states must adopt some federal provisions verbatim or almost verbatim, while they have more flexibility in adopting other provisions. To help the states determine the level of compatibility required for the various program elements, NRC created four categories whereby each applicable provision in the relevant Code of Federal Regulations can be ranked with a letter from A through D reflecting their "Compatibility Category." For each of these Compatibility Categories, NRC has provided guidance that explains to the Agreement State the extent to which the language in the state regulation must conform to the language in the Commission's regulation. *Id.*

Under this scheme, NRC's definition of source material and the applicable exemptions would be classified as Compatibility Category B,²⁰ meaning that it is a "program element with significant transboundary implications."²¹ Therefore, the "Agreement State program elements should be essentially identical to those of the Commission."²² NRC has further defined "essentially identical" to mean that "the interpretation of the text must be the same regardless of the version (NRC or Agreement State) that is read."²³

Moreover, as the California legislature has stated in the Radiation Control Law, it is the policy of the State of California "to institute and maintain a regulatory program for sources of ionizing radiation so as to provide for: (a) compatibility with the standards and regulatory programs of the federal government, . . . and (c) a system consonant insofar as possible with those of other states."²⁴

3. Jurisdiction under Agreement State authority and under the California Radiation Control Law

¹⁹ Statement of Principles and Policy for the Agreement State Program; Policy Statement on Adequacy and Compatibility of Agreement State Programs, 62 Fed. Reg. 46517 (September 3, 1997).

²⁰ Telephone between Paul Gormley and Cordelia Maupin, Senior Project Manager, Office of State Programs, NRC (October 28, 1997). See also, Letter from Paul H. Lohaus, Deputy Director, Office of State Programs, NRC, to All Agreement States, Appendix B, Attachment 6 (August 6, 1997).

²¹ 62 Fed. Reg. 46524.

²² *Id.* (emphasis added).

²³ NRC Directive 5.9, Adequacy and Compatibility of Agreement State Programs 15 (Summer 1997 Draft).

²⁴ Cal. H&S Code § 114965.

Both the federal and state regulatory programs include important definitions and exemptions that are relevant in the context of regulatory jurisdiction over the MolyCorp Mountain Pass Facility. First, the definition of source material is relevant to a determination as to which materials at the facility are subject to California's AEA jurisdiction. Second, because NRC regulations and California regulations exempt from licensing requirements those materials with source material content less than 0.05% uranium or thorium, portions of the facility do not fall within California's AEA jurisdiction. Third, because MolyCorp is involved with the mining, milling and beneficiation of bastnasite ore and the rare earths in those ores, NRC's and RHB's rare earths exemption applies to portions of the facility and related materials.

a. Source Material

As noted above, when Congress enacted the AEA, it asserted federal jurisdiction over limited classes of materials. Specifically, Congress provided for the regulation of source material, special nuclear material, and byproduct material.

Because MolyCorp does not possess any plutonium, uranium 233 or uranium 235, or any material which the NRC has determined to be special nuclear material, or any material artificially enriched in one of the foregoing isotopes, the facility does not have any special nuclear material. Additionally, because the facility does not involve the production or utilization of special nuclear material, there is no 11e.(1) byproduct material that would be relevant to this proposal.²⁵ Finally, because MolyCorp does not extract or concentrate uranium or thorium from ore that is processed primarily for its source material content, there is no 11e.(2) byproduct material.

However, there are materials at Mountain Pass that fall within the definition of source material. As noted above, the AEA defines source material as:

Uranium, thorium, or any other material which is determined by the Commission...to be source material; or (2) ores containing one or more of the foregoing materials, in such concentration as the Commission may by regulation determine from time to time.²⁶

NRC has interpreted this definition to include:

(1) Uranium or thorium, or any combination thereof, in any physical or chemical form; or (2) ores which contain by weight one-twentieth of one percent (0.05%) or more of: (i)

²⁵ Although, as noted above, there are some sealed gauges containing byproduct material that are subject to an existing license.

²⁶ 42 U.S.C. § 2014(z).

uranium, (ii) thorium, or (iii) any combination thereof. Source material does not include special nuclear material.²⁷

Although there is no definition of source material "declared" in RHB's regulations, the California Radiation Control Law similarly defines source material as:

(1) uranium, thorium, or any material which the department [of Health Services] declares by rule to be source material after the [NRC] has determined the materials to be such; or
(2) ores containing one or more of the foregoing materials, in such concentration as the department declares by rule to be source material after the [NRC] has determined the material in such concentration to be source material.²⁸

Applying this definition, Molycorp does possess some licensable source material which is properly subject to California's AEA Agreement State jurisdiction. Before determining whether Molycorp must license all materials at the facility that fall within the definition of "source material," consideration of two relevant exemptions is necessary.

(1) The 0.05% Exemption

Section 62 of the AEA expressly states that "licenses *shall not* be required for quantities of source material which, in the opinion of the Commission, are unimportant."²⁹ The mandatory language of this section provides clear evidence of Congress' intent that source material not be subject to regulation when present at levels that NRC has determined to constitute "unimportant quantities." Moreover, because the AEA preempts state law in the area of source material regulation, Section 62 operates to prevent *any* state – whether Agreement State or not – from regulating source material at levels that NRC has designated as constituting an "unimportant quantity."

Pursuant to its authority under AEA Section 62, NRC has designated as an "unimportant quantity" of source material, which is exempt from licensing requirements:

any chemical mixture, compound, solution, or alloy in which the source material is by weight less than one-twentieth of 1 percent (0.05 percent) of the mixture, compound, solution or alloy.³⁰

²⁷ 10 C.F.R. § 40.4

²⁸ Cal. H&S Code § 114985(e).

²⁹ Atomic Energy Act of 1954, as amended, Section 62 (42 U.S.C. § 2092).

³⁰ 10 C.F.R. § 40.14(a).

The California Department of Health Services, Radiologic Health Branch ("RHB"), consistent with AEA Section 62 and with NRC's regulations, has exempted from licensing requirements "[a]ny chemical mixture, compound, solution or alloy containing up to one-twentieth of one percent (0.05 percent) by weight of source material."³¹ Applying this exemption to the Molycorp facility would result in several portions of the facility falling outside RHB AEA jurisdiction.

For example, as demonstrated by the attached analytical data, the average uranium and thorium concentration in Molycorp's tailings is well below the 0.05% threshold. Therefore, because of their low source material content and because they contain no special nuclear or byproduct material, the tailings at the site would not be subject to AEA licensing requirements.

Additionally, as set forth in the attached analytical data and *supra*, much of Molycorp's facility involves the use or possession of materials with less than 0.05% source material. These portions, because they fall outside the scope of AEA jurisdiction, are not subject to RHB AEA licensing requirements.

(2) The Rare Earths Exemption

Pursuant to its authority to define what constitutes "unimportant quantities" of source material, NRC has designated as "unimportant" certain amounts of source material associated with rare earth metals. Specifically, NRC's regulations designate as unimportant:

- (1) any quantity of thorium contained in . . . (vi) *rare earth metals and compounds, mixtures, and products* containing not more than .25 percent by weight thorium, uranium, or any combination of these.³²

As discussed previously, under Section 62 of the AEA, "unimportant quantities" of source material are excluded from licensing and regulation. Because the AEA preempts state law with respect to the regulation of source material, materials that fit within the "rare earths" exemption set forth in NRC's regulations cannot be subject to licensing or regulation under state law – whether based on its Agreement State authority or its inherent power to regulate or non-AEA materials.

The original version of NRC's rare earths exemption, which became effective March 31, 1947, and was codified at 11 C.F.R. §§ 40.10 and 40.60, referred only to

³¹ Cal. Code Regs. Tit. 17 § 30180(c)(2).

³² 10 C.F.R. § 40.13(c)(1)(vi) (emphasis added); This exemption, on its face could be considered somewhat confusing regarding its applicability to uranium in rare earth metals. However, notwithstanding the prefatory language indicating that the rule exempts "any quantities of thorium," the specific language of the rare earth's exemption shows that it also applies to uranium

exempted "products." The exemption was not included in the February 13, 1961 revisions of the regulations. Following a request from the American Potash Chemical Corporation to reinstate the exemption, 10 C.F.R. § 40.13 was amended to re-establish the rare earths exemption. The final version, however, no longer limited the exemption to "products."³³ As stated in the Federal Register notice, the Commission "found that possession and use of in the United States of source materials in the *materials and products* for which the exemption is sought are not of significance to the common defense and security and that such activities can be conducted *without any unreasonable hazard to life or property*."³⁴ Therefore, the rare earths exemption is not limited solely to products.

California also provides an exemption for rare earth materials containing up to 0.25% source material. According to Cal. Code Regs. Tit. 17 § 30180(b):

[t]he following *products* are exempt from these regulations and from licensing requirements:(3) compounds or mixtures with rare earth elements containing up to 0.25% by weight of source material.

As will be discussed in greater detail below, the limitation of the exemption in the California regulations to products raises issues of compatibility with NRC's regulations.

Applying the exemption as articulated in the NRC regulations, the compounds, mixtures and products with up to 0.25% source material contained in or with rare earths, that are produced during Molycorp's milling operations, although potentially subject to NRC's AEA jurisdiction, are exempted from regulation and from licensing requirements because of the rare earths exemption. The specific portions of the facility that fall within this exemption are detailed *infra*.

Applying the rare earths exemption for only products as articulated in the California regulations would result only in Molycorp's final products being exempted from regulation as source material.

³³ Unimportant Quantities of Source Material, __ Fed. Reg. 3063 (1961).

³⁴ *Id.* (emphasis added).

Pursuant to the Agreement between NRC and California, both "the Commission and the State recognize the desirability of reciprocal recognition of licenses and exemption from licensing of those materials subject to [the] Agreement."³⁵ As discussed supra, pursuant to the Policy Statement on Adequacy and Compatibility of Agreement State Programs, RHB's interpretation of what constitutes source material and the exemptions must be "essentially identical" to NRC's interpretation. As noted above, California's applications of the definition of source material and the 0.05% exemption are "essentially identical" to NRC's interpretations.

However, if RHB chooses to interpret its rare earths exemption as applying to products only, then the exemption would differ from the NRC exemption for rare earths compounds, mixtures and products. Based on the Commission's guidance, a determination by RHB that the rare earths exemption applies only to products would not be "essentially identical" to NRC's interpretation. Because the RHB exemption does not include *mixtures* and *compounds* which are not products, it would be narrower than the NRC exemption. This interpretation would violate the terms of the AEA provision, and the California Radiation Control Law provision, requiring RHB's program to be *compatible* with the NRC program.³⁶ Such inconsistent regulation, by imposing licensing requirements on facilities and operations not regulated by NRC, would frustrate the Commission's objective of ensuring "that the regulatory programs of the NRC and the Agreement States collectively establish a coherent nationwide effort for the control of AEA materials."³⁷

California's Administrative Record indicates that the rare earths exemption was never intended to apply solely to products. In 1986, RHB reorganized its regulatory exemptions from radioactive materials licensing requirements. Prior to this reorganization, the California rare earths exemption expressly applied to "*compounds or mixtures*" with rare earth metals. No mention was made of *products* at all.³⁸ As the administrative record for California's rare earths exemption indicates, when updating these regulations RHB did not intend to narrow the scope of the exemption. Rather, as noted in the Final Statement of Reasons for the revision, RHB intended only to consolidate the exemptions into a single regulation and to establish compatibility with NRC regulations.³⁹ Any apparent limitation of the rare earths exemption was

³⁵ 27 Fed. Reg. 3864 (*emphasis added*).

³⁶ Section 274 of that act allows the NRC to enter agreements with states allowing the state to assume regulatory responsibility for byproduct materials, source materials, and special nuclear materials "in quantities not sufficient to form a critical mass." 42 U.S.C. § 2021(b). As a requirement of entering into such an agreement, however, the Commission must find that the state program is "compatible with the Commission's program for the regulation of such materials." 42 U.S.C. § 2021(c)(2).

³⁷ NRC, Statement of Principles and Policy for the Agreement State Program 10 (*emphasis added*).

³⁸ See, Cal. Code Regs. tit. 17 § 30180(c)(3) (1971).

³⁹ See, Final Statement of Reasons, Title 17, Chapter 5, Subchapter 4, Group 2, Licensing of Radioactive Materials (1986). Note that, for reasons unrelated to this exemption, the Office of Administrative Law

Footnote continued on next page

unintentional. Therefore, limiting the rare earths exemption only to products would be inconsistent with California's own historical regulatory scheme, as well as incompatible with NRC's.

Additionally, if RHB chooses to apply the exemption narrowly such that only MolyCorp's products that do not reach the 0.25% threshold will be exempt, such a result acts only to demonstrate the difficulties inherent in the interpretation. Specifically, there is little sense in a scheme that would exempt from licensing requirements those materials packaged for shipment off-site, but would not exempt the identical materials present at a site. Indeed, under any such interpretation, non-exempt materials could have lower concentrations of radioactive material than exempt materials.

B. State Authority over Non-AEA Regulated Materials

1. Federal Authority Preempts with Respect to AEA Materials; State Requirements Cannot and Do Not Conflict with Federal Requirements

The State cannot, pursuant to its authority under the AEA, regulate source material that is exempt from licensing requirements under the 0.05% exemption and the rare earths exemption. Additionally, California cannot use its general authority to regulate non-AEA materials to regulate materials, such as exempted source material, that are part of the AEA's and NRC's regulatory universe, on the basis of other radionuclides that occur in the decay chain of primordial radionuclides. Any mixture that contains ^{232}Th or ^{238}U necessarily contains radium. To regulate radium associated with (and in natural equilibrium with) exempted source material would amount to "backdoor" regulation of such source material and would negate the meaning and effect of the statutory and regulatory exemption.

California has adopted Standards for Protection Against Radiation which incorporate the standards found in 10 C.F.R. §§ 20.1001-20.2402, with a few exceptions.⁴⁰ These regulations are applicable to:

all persons who possess sources of radiation, except as exempt from the licensing and registration requirements or otherwise specifically exempted by the provisions of Group 1 and Group 2 of this subchapter.⁴¹

Footnote continued from previous page

disapproved this Final Statement of Reasons and issued a Supplement to the Final Statement of Reasons. However, the rationale for the Final Statement of Reasons was unaffected by the Supplement, and therefore is still valid. See, Supplement to Final Statement of Reasons, Title 17, Chapter 5, Subchapter 4, Group 2, Licensing of Radioactive Materials (1986).

⁴⁰ Cal. Code Regs. tit. 17 § 30252.

⁴¹ Cal. Code Regs. tit. 17 § 30252(a).

Radiation is defined as "gamma rays and X-rays; alpha and beta particles, high-speed electrons, neutrons, protons, and other nuclear particles; but not sound or radio waves, or visible, infrared, or ultraviolet light."⁴² Both the rare earth exemption and the 0.05% exemption are found in the Group 2 provisions of the subchapter.⁴³ Additionally, the limits found in Group 3 do not apply to background radiation.⁴⁴

The exemptions for materials with up to 0.05% source material content and rare earths with up to 0.25% source material operate to exempt those same materials from the California's Radiation Protection Standards. So far, California has correctly refrained from regulating these exempted materials, which are under the purview of the AEA.

Any attempt by RHB, at this juncture, to regulate exempt source material at Molycorp on the basis its associated radium content would be in direct violation of the California Radiation Protection Standards, as well as beyond the scope of California's authority either as an Agreement State or even if it were a non-Agreement State.

Molycorp notes however, that the State would apparently have the authority to regulate radium concentrations above background not associated with source material in natural equilibrium. For example, the State could certainly regulate radium associated with phospho gypsum stacks.

2. State Requirements Pertaining to Non-AEA Materials Cannot be Arbitrary or Capricious

Even if California had the authority under its inherent police powers, as reflected in Part 9 "Radiation" of the California Health and Safety Code and Title 17, Public Health, Division 1, Department of Health Services, Chapter 5, Subchapter 4, Radiation, of the California Code of Regulations, to regulate the radium content in the exempt materials, the manner in which the State apparently would seek to do so would be arbitrary and capricious.⁴⁵ It would be entirely arbitrary to regulate radium solely on the basis of whether it is above background levels,⁴⁶ given that background levels vary widely throughout the State of California, as they do in the various materials milled at the Molycorp facility and other facilities around the State. Even if it is probable that at some stage of the milling operation materials at Molycorp have radium levels above background for the particular material being recovered, that radium level may be below

⁴² Cal. Code Regs. tit. 17 § 30100(p).

⁴³ Cal. Code Regs. tit. 17 §§ 30180(b)(3) and 30180(c)(2).

⁴⁴ Cal. Code Regs. tit. 17 § 30252(b).

⁴⁵ See e.g., *Detroit Edison Co. v. Michigan Air Pollution Control Commission*, 423 N.W. 2d 306, 310 (Mich. Ct. App. 1988) (explaining that substantive due process requires that reasonably precise standards be utilized in the performance of delegated tasks so as to prevent favoritism, discrimination and arbitrary decisions by administrative agencies and to adequately protect the interests of those affected.).

⁴⁶ Cal. Code Regs. tit. 17 § 30252(b).

background levels for other materials present at the facility or present elsewhere in California. Moreover, even assuming that radium would be above some identified background level, the question remains would the potential incremental risk from such concentrations be "significant?"⁴⁷ Therefore, to regulate materials that are radiologically the same, and which pose the same potential threat to human health and the environment, under two different regulatory schemes, is both arbitrary and capricious.

Additionally, the State neither specifically addresses in its regulations radium-226 or radium-228, which are decay products of uranium and thorium and the forms of radium present in the Molycorp materials, nor articulates any potential incremental health and safety risks attributable to these forms of radium present in concentrations above background levels.⁴⁸ This total lack of justification for and articulation of a formally promulgated radiation control standard, to be applied in this context, makes an attempt to regulate both arbitrary and capricious. Therefore, absent a showing of a significant potential threat to human health and safety, it is patently unfair, for licensing purposes, to distinguish between various materials at Molycorp (and elsewhere throughout the state) solely on the basis of whether radium contained in them is at some unknown and variable background level. In addition, the radium concentrations from the Molycorp materials are so low that they do not constitute a significant component of the 100 millirem per year dose standard set forth in 10 C.F.R. Part 20.

C. The State's Authority Over Different Portions of the Mountain Pass Facility

1. Pre-Concentration Operations Should Not Be Subject to Licensing

As discussed above, during the initial phases of the operation, the ore, which contains less than 0.05% source material and radium at a level which is the "background" ore level⁴⁹, is mined, crushed and blended. It is then further reduced in particle size, and combined with water, in the ball mill. During these operations the chemical status of the ore is unchanged. Therefore, as explained above, pursuant to

⁴⁷ See *AFL-CIO v. American Petroleum Institute*, 448 U.S. 607 (1980). (In order to establish workplace standards, OSHA is required to make a threshold finding that a significant risk is present, and can be eliminated or lessened by a change in practices. This requires a cost-benefit analysis prior to the promulgation of any standard, and this analysis must show, on the basis of substantial evidence, that the standard is justified.)

⁴⁸ The regulations do contain an exemption for Radium-223 in concentrations not exceeding 1×10^{-7} micro curies per milliliter in liquids and solids. Cal. Code Regs. tit. 17 §§ 30180(c)(3) and 30237 Schedule C.

⁴⁹ Rogers & Associates Engineering Corporation. *Radiological Characterization of Materials Streams. Molycorp Facility at Mountain Pas. California*. RAE-9143/108-1. November 1998.

both NRC regulations and the California regulations, these materials are not within the jurisdiction of the RHB.⁵⁰

After leaving the ball mill, the materials go through the flotation unit. During flotation the crushed ore goes through several various cells whereby the product is skimmed off and wastes in the form of tailings are produced. The resulting tailings contain less than 0.05% source material and radium at less than background ore levels.⁵¹ Therefore, as previously explained and will be explained in greater detail *infra*, these tailings are not within the regulatory authority of the RHB.⁵²

During the flotation operation, the radium concentrations (or concentrations of other natural elements) may temporarily spike above the entering levels, but prior to exiting the flotation operations both the material that enters the next phase and the wastes that exit to the tailings ponds are at or below background ore levels, including specifically radium,⁵³ although, throughout the entire flotation operation the source material levels in the material remain below 0.05%.⁵⁴ Therefore, under both NRC and California regulations, the material is not subject to regulation as source material.⁵⁵ Any temporary spike in radium concentrations during the flotation operation above background ore levels does not confer authority upon RHB to regulate the exempted material and does not confer authority to regulate tailings that contain radium at background ore levels.⁵⁶

After the flotation operation, the material is thickened and filtered. The concentration of source material during these operations remains below 0.05% and radium concentrations are below background ore levels. After being thickened, under normal operations approximately 15% of the material is leached. The concentration of source material remains below 0.05% and radium concentrations are below background ore levels during this leaching operation. After leaching, that material, as well as the other 85% of the material is sent to be filtered and dried.⁵⁷

⁵⁰ See, 10 C.F.R. § 40.14(a); Cal. Code Regs. Tit. 17 §§ 30180(c)(2) and 30252.

⁵¹ Rogers & Associates Engineering Corporation. *Radiological Characterization of Materials Streams, MolyCorp Facility at Mountain Pas, California*. RAE-9143/10B-1. November 1998.

⁵² See, 10 C.F.R. § 40.14(a); Cal. Code Regs. tit. 17 §§ 30180(c)(2) and 30252.

⁵³ Rogers & Associates Engineering Corporation. *Radiological Characterization of Materials Streams, MolyCorp Facility at Mountain Pas, California*. RAE-9143/10B-1. November 1998.

⁵⁴ *Id.*

⁵⁵ See, 10 C.F.R. § 40.14(a); Cal. Code Regs. tit. 17 § 30180(c)(2).

⁵⁶ See, Cal. Code Regs. tit 17 § 30252(a). As previously noted, it is beyond the scope of California's authority as an Agreement State to regulate materials contemplated under the AEA and specifically exempted on the basis its radium content which is an inherent component of source material.

⁵⁷ The water overflow from the thickening operation, which has concentrations of less than 0.05% source material and at our below background levels of radium, is either recycled back into the ball mill or is disposed of in tailings ponds P-1 or P-16. Similarly, the wastes from the leaching operation has

Footnote continued on next page

2. Concentration, Separation, and Specialty Operations Are Subject to Licensing by the State

The material is sent to the drum filter from the thickener for drying. The drying drives off the moisture and reduces the volume of the material which has the effect of increasing the percentage concentration of material in the remaining volume such that the source material content exceeds 0.05% but is less than 0.25%.⁵⁸ Therefore, at the drum filter stage of the operation the material is no longer eligible for the 0.05% exemption. While Molycorp does not believe that the rare earth exemption is limited only to products, Molycorp is willing to proceed at this time with license discussions based on the 0.05% licensable source material level which would allow the state to license facilities and materials from the drum filter up to end product under its AEA authority to regulate licensable source material.⁵⁹ Under normal operations, at this stage, part of the material is packaged as product and shipped off-site. As will be discussed below, that product is not regulated as source material due to application of the rare earths exemption. In the past, the remainder of the bastnasite concentrate would be sent for further recovery operations. Currently, however, as explained *supra*, operations at the separation and specialty plants have temporarily ceased. Therefore, all of the bastnasite concentrate is being packaged and shipped off-site as product and is eligible for the rare earths exemption.

When fully operational, the bastnasite concentrate that is not shipped as product, which has a source material content greater than 0.05% and less than 0.25%, is further recovered and Molycorp proposes that those facilities be regulated in the future as noted directly above. During some steps of the remaining operation the concentration remains below 0.25% source material and, therefore, in Molycorp's view would be eligible for the rare earths exemption as articulated in the NRC regulations, and as it should properly be applied under the California regulatory scheme.⁶⁰ However, at other steps in the separation operations the source material concentration exceeds 0.25%⁶¹ and would no longer be eligible for the rare earths exemption and consequently would be regulated as source material. Since during some phases of the concentration and separation operations the material is properly regulated as source material, Molycorp, in an effort to come to a mutually beneficial resolution and for ease of regulation, is willing

Footnote continued from previous page

concentrations of less than 0.05% source material and at our below background levels of radium and is disposed of in the ponds.

⁵⁸ Rogers & Associates Engineering Corporation. *Radiological Characterization of Materials Streams, Molycorp Facility at Mountain Pas, California*. RAE-9143/10B-1. November 1998.

⁵⁹ Molycorp reserves its right to contest at a later date California's limitation of the rare earth's exemption to products alone.

⁶⁰ See, 10 C.F.R. § 40.13(c)(1)(vi). As discussed *supra*, California's application of the rare earths exemption must be compatible with NRC's interpretation.

⁶¹ Rogers & Associates Engineering Corporation. *Radiological Characterization of Materials Streams, Molycorp Facility at Mountain Pas, California*. RAE-9143/10B-1. November 1998.

at this time to allow California to regulate as source material all materials present from the drum filter stage prior to creation of the final products, because they exceed 0.05% source material.

3. Final Products Should Not Be Licensed

All of the final products produced at Molycorp are rare earth products containing not more than 0.25% by weight thorium, uranium or any combination of these and which have less than or equal to background levels of radium from the ore. Therefore, there is no question that under both the NRC regulations and the California regulations, the final products are exempt from regulation as source material.⁶² Furthermore, they are explicitly exempt from regulation under the California Standards for Protection Against Radiation since they contain less than or equal to background levels of radium.⁶³ -

4. Tailings Ponds are Not Subject to 10 C.F.R. Part 40 Appendix A Criteria

The State has requested that Molycorp explain how "all new ponds on-site [] will meet the design criteria in 10 CFR 40, Appendix A, or why the criteria would not be applicable." See Email from Frieda Taylor, CA DHS-RHB, to William Sharrer, Molycorp, Inc. (Feb. 13, 2001). In short, because 11e.(2) byproduct material is not being created or disposed of at the facility, and the criteria in Appendix A apply only to such byproduct material, Appendix A does not apply. Moreover, in light of the inapplicability of the Uranium Mill Tailings Radiation and Control Act of 1978 ("UMTRCA"), Pub. Law No. 95-604, as it amends the AEA, it would be inappropriate and unreasonable to apply Appendix A criteria to Molycorp tailings.

By way of background, Appendix A criteria are one part of a larger regulatory program developed by NRC, pursuant to its authority under UMTRCA, to regulate a specific type of wastes, including mill tailings, that the meet the definition of "byproduct material" set forth in AEA section 11e.(2).⁶⁴ Congress enacted UMTRCA to address concerns regarding disposal and long term control of such materials. As a result, UMTRCA requires transfer of 11e.(2) waste to a mandated governmental custodian at no cost to the government. This statutory framework is not available to Molycorp or RHB for Molycorp tailings. In addition, In 1983, Congress amended UMTRCA. Pub. L. No. 97-415, §§ 18-22 (1983). In amending UMTRCA, Congress added flexibility to section 84(c) by permitting licensees to propose alternatives to the Commission's Part 40 and Appendix A requirements. Specifically, Congress provided that "[i]n the case of

⁶² See, 10 C.F.R. § 40.13(c)(1)(vi); Cal. Code Regs. tit. 17 § 30180(b).

⁶³ See, Cal. Code Regs. tit. 17 § 30252(b).

⁶⁴ "Byproduct material" is defined in section 11e.(2) as "(1) any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material, and (2) the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content." 42 U.S.C. § 2014(e).

sites at which ores are processed primarily for their source material content or which are used for the disposal of byproduct material as defined in section [11e.(2)], a licensee may propose alternatives to specific requirements adopted and enforced by the Commission under this [Act]." 42 U.S.C. § 2114(c). This means that even where Appendix A is applicable the licensee has the statutory and regulatory "right" to propose an "alternative" to any NRC or EPA requirement.

Here, the Molycorp facility neither produced nor disposed of byproduct material as that term is defined in section 11e.(2). Accordingly, the criteria in Appendix A do not apply to the facility, including any new or existing tailings impoundments, ponds, etc. at the facility.

Moreover, to the extent the State would like to somehow rely on Appendix A criteria, it is readily apparent that the application of the criteria to the site is inappropriate and unreasonable. For example, Criterion 3 of Appendix A provides that the "prime option" for disposal of tailings is placement below grade. It is highly impractical to dispose of the tailings at the Molycorp site below grade because it would require substantial blasting and mining of rock to construct such an impoundment. Moreover, a long-term custodian (Criterion 11), long-term surveillance (Criterion 12), financial surety (Criterion 9), and 1000 year closure requirements, are not relevant to the Molycorp site either. Accordingly, from a legal and practical perspective, new tailings ponds, cells, etc., should not be required to satisfy the criteria set forth in 10 C.F.R. Part 40, Appendix A.

IV. CONCLUSION

Molycorp desires to work with RHB to come to a mutually beneficial resolution of the licensing and regulatory issues surrounding the radioactive materials at the Mountain Pass Facility. For the aforementioned reasons, Molycorp agrees to allow RHB to license as source material, pursuant to its AEA Agreement State authority, materials (and their associated activities and facilities) at the facility from the point in operations where the partially recovered ore is placed into the drum filter through formation of the final products. It is Molycorp's position that the State does not have jurisdiction to regulate (1) the ore through the various phases up to being placed in the drum filter, (2) tailings generated during flotation and the associated tailings impoundments, and (3) any and all final products

SUMMARY OF LABORATORY RESULTS - RADIOCHEMISTRY
POND P-1

CONSTITUENT (pCi/g)	BORING IDENTIFICATION NUMBER/DEPTH (Feet)																				
	TOTAL CONCENTRATION (pCi/g)																				
	BACKGROUND SOIL SAMPLES (Upgradient)				AREA I - Main Tailings Area					AREA II - Closed Pond Materials										AREA III ¹⁾ - North Canyon Area	
	BG-1/ 0.5	BG-2/ 0.5	BG-3/ 0.5	BG-4/ 0.5	BI-1/ 2-2.5	BI-3/ 2-2.5	BI-6/ 5-5.5	BI-8/ 25-25.5	BI-7/ 2-2.5	BII-1/ 5-5.5	BII-1/ 20-20.5	BII-1/ 25-25.5	BII-2/ 2-2.5	BII-4/ 11-11.5	BII-5/ 2-2.5	BII-5/ 15-15.5	BII-7/ 2-2.5	BII-7/ 5-5.5	BIII-3/ 2-2.5/ 5-5.5	BIII-6/ 2-2.5/ 5-5.5/ 10-10.5	
Ac-228	2.70	2.77	1.78	1.88	12.7	24.9	54.3	11.80	13.9	9.50	15.1	11.39	50.5	6.78	8.04	16.1	18.8	8.54	10.59	12.12	
Bi-214	0.58	0.74	0.408	0.591	2.29	4.70	5.01	1.79	4.23	1.51	1.60	1.11	2.38	1.23	1.75	1.72	4.13	1.59	1.05	3.54	
Co-57	-0.024	-0.003	-0.002	-0.023	0.049	-0.007	-0.007	-0.011	-0.029	-0.008	-0.028	0.023	0.013	-0.012	-0.001	-0.018	0.009	0.007	0.008	0.026	
Co-60	-0.007	-0.035	-0.006	-0.011	-0.001	-0.105	0.020	-0.004	0.016	-0.007	-0.028	-0.011	-0.051	-0.016	-0.009	-0.007	-0.013	-0.031	-0.013	-0.008	
Cs-134	0.008	-0.032	0.001	-0.002	0.048	0.178	0.041	0.035	0.091	0.023	0.007	0.040	0.083	0.022	0.044	0.114	0.063	0.005	0.011	-0.038	
Cs-137	0.088	0.243	0.027	0.068	-0.037	-0.175	-0.08	-0.009	-0.098	0.000	-0.037	-0.020	-0.034	0.029	0.021	-0.068	-0.014	-0.053	-0.069	-0.032	
K-40	19.1	22.7	18.3	15.8	2.60	3.2	25.3	4.95	6.5	20.0	0.80	0.65	17.3	11.4	3.04	0.45	7.7	19.6	0.86	7.3	
Pb-212	2.26	3.32	1.76	1.83	11.3	25.2	56.5	10.8	14.2	8.15	13.4	9.71	41.0	6.09	5.46	15.7	19.9	7.98	9.8	11.0	
Pb-214	0.583	0.92	0.552	0.682	2.60	5.14	8.35	2.18	4.92	1.89	2.03	1.37	2.80	1.50	1.95	2.20	4.88	2.32	1.38	4.49	
Ra-226 (Gamma)	1.28	1.34	1.06	-0.09	3.95	11.5	9.8	2.68	6.7	4.24	2.18	1.34	-0.7	2.43	2.47	4.1	8.0	2.29	2.98	4.2	
Ra-228	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Th-234	0.38	1.13	1.45	0.74	0.25	1.70	3.9	1.3	1.7	1.00	2.1	0.3	1.1	0.7	0.19	1.0	1.2	1.6	0.4	2.7	
Ti-208	0.78	0.85	0.584	0.554	3.72	9.20	17.1	3.44	4.58	2.76	4.31	3.27	14.4	1.99	1.88	5.08	6.01	2.55	3.21	3.49	
U-235 (Gamma)	0.08	-0.12	-0.122	0.04	0.11	-0.13	-0.40	0.18	0.20	0.03	0.13	0.04	0.27	0.08	0.05	-0.03	0.08	0.23	0.05	0.23	
Gross Alpha	28.4	19.9	18.4	13.5	137	190	221	54.9	150	111	86	76	473	62	66	88	187	108	88	86	
Gross Beta	22.2	23.4	32.1	22.6	58.2	84.6	78.0	31.1	56.2	65.8	42.4	34.8	165.0	30.6	23.8	44.8	73.8	48.3	27.9	44.4	
Si-90	-0.8	0.38	-0.06	-0.33	-0.18	-0.26	0.06	0.23	0.07	0.65	0.08	-0.11	0.07	0.1	-0.24	0.05	-0.08	-0.08	-0.46	0.22	
Th-228	2.05	2.36	1.41	1.29	15.0	24.8	18.1	10.6	13.7	14.6	14.9	13.7	35.3	3.5	5.2	12.0	16.2	12.1	10.4	9.3	
Th-230	1.93	1.34	1.78	2.03	3.2	4.1	4.0	4.1	6.1	4.2	3.5	3.4	4.3	4.8	1.75	5.9	7.8	5.4	3.3	8.6	
Th-232	1.99	2.45	0.74	1.52	13.4	12.8	16.6	8.3	13.8	10.9	12.6	12.7	33.3	8.3	3.43	15.1	15.0	11.2	11.8	6.1	
U-233/4	0.93	1.15	0.45	0.82	4.36	4.19	4.25	2.80	6.3	2.82	2.48	1.54	1.46	2.81	1.86	4.6	2.47	7.27	2.00	6.55	
U-235	0.114	0.45	0.026	0.048	0.96	0.73	0.338	0.34	1.47	0.47	0.188	0.040	0.188	0.85	0.45	1.16	0.093	0.48	0.70	0.43	
U-238	0.85	1.16	0.39	0.58	4.79	4.57	3.98	2.61	4.1	4.0	2.53	1.69	1.60	2.74	1.95	4.4	2.35	6.61	2.50	6.61	

(1) Samples collected from Boring BIII-3 and BIII-6 were composited for analysis.

NA = NOT ANALYZED

Facsimile Cover Sheet



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Dennis - There are some additions to
the Labaus letter. They are in bold.
If you have any questions, please call.
Rob Greger