

For: The Commissioners

From: James M. Taylor,
Executive Director
for Operations

Subject: DISPOSAL OF NON-BYPRODUCT MATERIAL INTO URANIUM AND
THORIUM MILL TAILINGS IMPOUNDMENTS.

Purpose: To obtain Commission approval of staff
recommendations for responding to applicant requests
to: (1) process feed materials at uranium mills other
than source material ore or natural mineral ore; and
(2) dispose of non-byproduct material into uranium
and thorium mill tailings impoundments.

Category: This paper covers policy issues requiring Commission
consideration and approval.

Background: The Uranium Mill Tailings Radiation Control Act of
1978, as amended, modified the Atomic Energy Act
(AEA) of 1954 [Section 11e.(2)] by designating
uranium and thorium mill tailings as byproduct
material to be regulated by the NRC or the
appropriate Agreement State. Henceforth, 11e.(2)
byproduct material will be referred to as "byproduct
material." The NRC and Agreement States have
recently received requests to allow activities at
licensed uranium milling facilities other than the
routine processing of source material ore or natural
mineral ore. These requests have fallen into two
categories.

The first category requests processing, for the
uranium content, of material that is not usually
thought of as source material ore and then to

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dispose of the resulting wastes and tailings into the facility's tailings impoundment. An application of this practice could include a uranium mill processing, for the uranium content, of mine water cleanup residues or tailings resulting from a rare earth processing operation.

The second category requests direct disposal of radioactive waste material, which was generated off-site, into the tailings impoundment of a licensed uranium or thorium milling operation. Henceforth, such material will be referred to as non-byproduct material. In this case the mine water cleanup residues or tailings resulting from a rare earth operation would be placed directly into the mill tailings impoundment without any processing or treatment. Enclosure 1 discusses in greater detail the past practices and the NRC-staff recommended resolution.

In the past, uranium mills have occasionally disposed of small quantities of non-byproduct material in tailings either under the conditions of their existing license or following NRC or Agreement-State approval of a specific license amendment request. NRC approved these disposals, since the quantities were negligible in comparison to the mill tailings.

As these requests for disposal became more frequent, the NRC staff generated specific guidance (Enclosure 2) for addressing certain of these requests on a case-by-case basis. Following this guidance, NRC staff will approve the disposal of non-byproduct material into tailings impoundments provided the licensee demonstrates:

1. There are no significant environmental impacts to the public health, safety and the environment.
2. The reclamation of the impoundment will not be compromised.
3. There are no Resource Conservation and Recovery Act (RCRA) or Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) problems.

4. The USDOE or the State agree, in advance, to take title to the site upon completion of the reclamation.

The recent expressions of interest to either process other feedstock material at licensed milling facilities or to dispose of non-byproduct material in mill tailings impoundments has resulted in the need for broader Commission consideration of the guidance presently being applied by staff and the establishment of a more definitive policy before the staff proceeds to approve or disapprove present and future requests.

Discussion:

Resolution of these issues for approval of such requests involves, in part, two concepts in the existing statutes and implementing regulations. The first relates to the meaning of source material ore. The second relates to the commingling^{of} with materials not meeting the definition of byproduct material. Each is addressed in the following:

1. Processing, for the uranium content, of feedstock that may not meet the more common definition of ore.

The major issue in this case is that feed materials proposed for processing through the uranium mill are not usually thought of as ore. Rather, they are more commonly understood to be residues resulting from the cleanup of mine water at nearby uranium mines or from the processing of ores for recovery of other mineral content, such as zirconium. Since such feed materials are not presently thought of as "ore", the waste resulting from the milling operation has not been considered byproduct material and may be subject to regulatory control by other entities under authorities distinct from the Atomic Energy Act (AEA), such as EPA under RCRA.

Title 10 CFR Part 40, Section 40.4(a-1) defines byproduct material as "...the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content." Neither the AEA nor 10 CFR Part 40 contain a definition of the term "ore." The term "ore" in the definition of byproduct material could be applied to encompass a broader class of feed

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materials than just uranium or thorium bearing rock. Any material with sufficient uranium or thorium to justify its extraction in a uranium and/or thorium mill could be considered "ore."² Following processing of such material as an ore by the mill for its source material content, the resulting waste or tailings would be considered byproduct material subject to NRC regulation under the Uranium Mill Tailings Radiation Control Act (UMTRCA) and 10 CFR Part 40. Such an interpretation has been followed by the NRC staff in the past (Enclosure 3).

2. Disposal of non-byproduct material, which was not generated on-site, into the tailings impoundment.

The major issue, in this case, is that under AEA, 583 authority, the Government's obligation to accept title to land and materials applies only to "byproduct material." Thus, following reclamation, any site containing commingled byproduct and non-byproduct material could face uncertainties in long-term ownership and post-closure surveillance responsibilities. Past correspondence from DOE (Enclosure 4) indicated uncertainty in DOE authority to take custody in such cases. NRC staff has requested more specificity from DOE in more clearly delineated cases (Enclosure 5) and is awaiting a response. A secondary issue involves the potential duplication of regulatory authority where byproduct and non-byproduct material are commingled; EPA could have regulatory interest in the byproduct material under RCRA or the Toxic Substances Control Act (TSCA). In the past the NRC staff has approved such disposals on a case by case basis.

Continued use of a broader definition of ore by the NRC staff to include a range of feed materials and

²Webster's Third New International Dictionary of the English Language (1961) defines ore as, " 1a: a natural or native mineral that can usually be profitably mined and treated for the extraction of any of its constituents, b: a source from which a valuable matter is extracted, c: an unrefined condition or mineral; 2: Precious metal."

the case-by-case approval of disposals of non-byproduct material into tailings will have a number of benefits including:

1. A number of orphaned wastes with physical characteristics similar to those of tailings could be disposed of, thereby reducing risks to workers, the public and environment from present conditions of storage.
2. Wastes resulting from ground-water cleanup programs at uranium mines could be either processed as ore or disposed of as specially-approved "byproduct-like material" at a nearby uranium mill tailings locations.
3. At some uranium mills, such material could be used as backfill reducing the need to obtain excavated clean borrow material as a prerequisite base for applying a radon attenuating cover. In most cases this would also reduce disturbance of nearby habitats.
4. Wastes from other currently operating and closed source material processing operations, rare earth processing facilities, formerly utilized sites (FUSRAP), etc..., with similar wastes could be disposed of in a more optimal fashion; i.e., reduce proliferation of disposal sites.
5. NRC and Agreement State licensees, who are presently considering such proposals, could move forward to either allow processing of feed materials at the mill or to dispose of non-byproduct material in tailings.

Finally, the NRC staff believes continued application by NRC of such interpretations would be consistent with the provisions and the legislative intent of UMTRCA. It should contribute to the reduction of individual disposal locations used for such wastes and to the ensuring that wastes having similar characteristics and properties are disposed of and controlled under a consistent and unified set of regulatory requirements.

Recommendations:

Three recommendations evolve from this analysis:

1. That the Commission acknowledge and approve that the NRC staff will continue to review and approve, on a case by case basis, requests from licensees to either: (1) process feed materials at uranium mills for source material content and to dispose of the resulting waste as byproduct material into the mill tailings impoundment subject to NRC or Agreement State regulation; or (2) dispose of non-byproduct material in tailings following existing guidance described under Background above.
2. That the Commission propose legislation to give the Commission discretion to authorize the disposal of non-byproduct material of similar character to byproduct material in tailings impoundments without affecting the ownership provisions of §83 of the AEA or subjecting the commingled material to separate and redundant RCRA permitting. With this discretion the Commission could better comply with the legislative intent of the UMTRCA to close the gap in NRC licensing authority to control the health hazards posed by uranium and thorium mill tailings. Such discretion would be expressly reserved to the Commission by modification to 10 CFR Part 150, §150.15(a).
3. That the Commission approves NRC rulemaking to promulgate in 10 CFR Part 40, a definition of ore in conjunction with the definition of byproduct material as follows: "For the purposes of this part, ore means a natural or native matter that may be mined and treated for the extraction of any of its constituents or any other matter from which source material is extracted in a uranium or thorium mill."

Upon Commission approval, NMBS staff, working in conjunction with OGC, RES, GFA/SP and Region IV staffs, will prepare a legislative proposal and rulemaking change as discussed above, for the Commission's approval.

Coordination:

This NRC staff effort was coordinated with the following NRC offices: OGC, Region IV, URFD, GFA/SP and RES.

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Enclosures:

1. Staff Analysis of Disposal of Non-Byproduct Material into Uranium Mill Tailings Piles.
2. July 27, 1988 NMSS Memorandum to Region IV on Guidance for Disposal of Radioactive Waste in Uranium Mill Tailings.
3. September 14, 1989 Region IV Letter Requesting Guidance for Processing of Source Material and Disposal of Wastes into Uranium Mill Tailings.
4. June 10, 1988 DOE Letter to NRC on DOE's Authority to Take Custody of Non-byproduct Material Mixed Tailings Sites.
5. October 5, 1989 and March 16, 1990 NRC Letters to DOE Requesting Clarification of DOE's Custodial Flexibility.

ENCLOSURE 1

STAFF ANALYSIS OF DISPOSAL OF NON-BYPRODUCT MATERIAL INTO URANIUM MILL TAILINGS PILES

A. INTRODUCTION

Recently, NRC has received several requests to allow activities other than the normal processing of native uranium ore at licensed uranium milling facilities. These requests have fallen into two categories. The first is to allow the processing of feedstock material, for the extraction of uranium, that may not meet the more common definition of ore and then dispose of the resulting wastes and tailings in the facility's tailings pile. The second category of requests is to allow the direct disposal of non-byproduct¹ material, which was not generated onsite, into tailings piles.

In assessing these requests, two concerns related to tailings piles repeatedly surface. The first is whether allowing the requested activity would result in complicated, dual or even multiple regulation of the tailings pile, and the second is whether allowing the requested activity would jeopardize the ultimate transfer to the United States, for perpetual custody and maintenance, of the reclaimed tailings pile.

This analysis generically addresses the issues resulting from proposals requesting regulatory consideration of commingling of tailings with other radioactive wastes and makes recommendations. The scope of this paper is limited to options involving commingling with existing tailings impoundments.

B. BACKGROUND

Prior to 1978, the NRC regulated the activities of the uranium milling process under its authority to regulate source material. The Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978 amended the Atomic Energy Act (AEA) of 1954 to specifically include uranium and thorium mill tailings and other wastes from the process as radioactive material to be licensed by NRC. Specifically, the definition of byproduct material was revised in section 11e.(2) of the AEA to include "... the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content."

The definition of byproduct material² in Section 11e.(2) of the AEA includes all of the wastes resulting from the milling process, not just the radioactive component. UMTRCA, Title II also amended the AEA to explicitly exclude the requirement for EPA permitting of byproduct material under the Resource

¹For the purposes of this paper, the term "non-byproduct material" will be used to refer to radioactive waste which is similar to byproduct material, as defined in the Atomic Energy Act in Section 11e.(2), but is not legally considered to be 11e.(2) byproduct material.

²Henceforth, byproduct material as defined in Section 11e.(2) of the AEA will be referred to as "11e.(2) byproduct material."

Conservation and Recovery Act (RCRA). This contrasts significantly with the situation for source material³ and other radioactive materials controlled under the authority of the AEA. This potential dual regulation by both NRC and EPA can become an issue when dealing with mixed hazardous wastes. As a result of UMTRCA, the NRC amended 10 CFR Part 40, in order to regulate the uranium and thorium tailings and wastes as well as the milling processes. Thus, under normal operation, all of the tailings and wastes in an NRC or Agreement State licensed mill producing uranium or thorium are classified as "11e.(2) byproduct material", and are disposed of in tailings piles regulated under 10 CFR Part 40. They are not subject to EPA regulation under RCRA. EPA Clean Air Act regulations still result in direct EPA permit authority over the mill tailings, whether or not commingling occurred.

The UMTRCA also required and provided for long-term custody and surveillance of the byproduct material and the land used for its disposal. However, the UMTRCA specifically referred only to 11e.(2) byproduct material and did not provide for transfer of title and custody of other material that may be mixed with it. Thus, DOE (the Federal agency currently designated as the "custodial agency" by the AEA) may not have the authority under the AEA to take custody of tailings disposal sites, in which non-byproduct material had been disposed. Even in the case where the material was no more radioactive or toxic than the uranium or thorium tailings themselves, there was no provision in UMTRCA allowing for the transfer of custody or title, and hence for eventual long-term custody and surveillance (See Enclosure A).

C. THE TWO CATEGORIES OF REQUESTS FOR COMMINGLED DISPOSAL

There have been a number of proposals to process feedstock materials other than the raw ore received directly from a mine at licensed mills. Some have been approved. Implicit in these requests is the assumption, after extraction of the source material content, that the resulting tailings and wastes would meet the definition of 11e.(2) byproduct material and could thus be disposed of in the mill's tailings pile. Such disposals would not be subject to RCRA consideration or call into question DOE's long-term custody authority. There does not appear to be any technical problem which would preclude addition of this waste material to the tailings after processing, since for all practical purposes it would be identical to the mill tailings. In all prior cases the quantities have been small in relation to the quantities of tailings already in the pile. In most of the proposals under consideration, this is still the case.

There have also been proposals to directly dispose of radioactive wastes in existing uranium mill tailings sites. The materials vary from tailings from metal and rare earths (Copper, Tantalum, Columbium, Zirconium, etc....) extraction processes to spent resins from water treatment processes. However,

³Except in the case of source material ore, source material consists only of the radioactive components of the waste; i.e., uranium, thorium or any combination of the two [10 CFR part 40, Section 40.4(h)]. Some source material contains elevated levels of radium, as well, but is not of sufficient concentration of uranium or thorium to be licensed under the AEA.

since these materials did not result from the extraction or concentration of uranium or thorium from ore, they are not lie.(2) byproduct material. These "orphaned" wastes usually have elevated concentrations of source material, and unless otherwise exempted, require licensed control if the materials exceed the 0.05% licensable criterion. Disposal of these materials into tailings impoundments would not result in a significant increase of impacts to the public health, safety and environment. Due to the relatively large volumes of these wastes, low-level waste disposal options are limited. These orphaned wastes are more similar to tailings in terms of volumes, radioactivity and toxicity. Therefore, some waste producers see the mill tailings disposal sites as a logical option for such disposal.

The NRC staff provided earlier guidance for addressing these types of requests on a case-by-case basis (See Enclosure A). In this guidance, cautions were raised regarding the potential problems with dual regulation (RCRA) and with custody and title transfer. Any NRC approvals of such disposals are now made on a case-specific basis contingent upon a demonstration by the licensee that:

1. There are no significant additional impacts to the public safety, health and the environment.
2. The reclamation of the tailings impoundment will not be compromised. In effect, the reclamation and closure criteria in 10 CFR Part 40, Appendix A would be complied with.
3. There are no RCRA or Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) problems.
4. The DOE or the State agrees to take title to the site upon completion of the reclamation.

The last two conditions can be significant obstacles to any routine decisions to allow such commingling of byproduct and non-byproduct materials under UMTRCA. Earlier queries to DOE regarding land transfer have not resulted in generic guidance for potential commingling situations (Enclosure B). The NRC staff requested clarification from DOE for five specific disposal scenarios (Enclosure C). As of this time, NRC has not received DOE's response.

D. TYPES OF WASTES BEING PROPOSED FOR DISPOSAL INTO TAILINGS PILES

Previously, the NRC had allowed a limited number of such disposals on a case-by-case basis, because the requested disposal could occur without safety or environmental impact. The following brief case histories discuss instances where the NRC approved of processing and/or disposal of radioactive waste materials at uranium mill tailings sites:

Example 1. Wastes from Domestic Water Purifying Operations.

In 1987 NRC allowed Quivira Mining Company's Ambrosia Lake uranium mill in New Mexico to elute uranium from contaminated ion-exchange resins from the Navajo Indian Nation's well water purifying operations in New Mexico and Arizona. The resultant wastes were combined with other ion-exchange residues from Quivira's operations. The combined spent resins were disposed of in the uranium mill tailings pile.

Although the surface wastes from an in situ solution mining operation, including such spent resins, are classified as 11e.(2) byproduct material, the wastes from the Navajo water purification operations would not be considered as such, despite the physical and chemical similarity.

Example 2. Processing Wastes from Other Extraction Operations.

The Rio Algom Lisbon uranium mill in Utah has received waste residues four times in the last seven years. These wastes include:

- 1) Waste residues from the Mallinckrodt Incorporated niobium-tantalum recovery facility in St. Louis, Missouri;
- 2) Waste residues from the Unical-Molycorp yttrium-lanthanides recovery facility in Loviers, Colorado;
- 3) Waste residues from the Allied Chemical Company's Metropolis, Illinois uranium hexafluoride (UF_6) conversion facility; and
- 4) Waste residues from the Westinghouse Electric Corporation's Bingham Canyon, Utah uranium secondary recovery ion-exchange facility.

The volume of waste ranged from minimal amounts to less than 1% of the annual throughput. The materials were radiologically consistent with the existing tailings and only fluoride was in higher concentration (>1%) than the levels typical of the existing tailings. In the first three waste disposals, the Lisbon operation extracted the uranium (the uranium concentration was as high as 6.7% in the residue from the UF_6 facility). The residues from the secondary recovery operation were buried in a pit excavated in the tailings pond.

In 1987 the NRC authorized the Quivira Mining Company to process residue from the Sequoyah Fuels Corporation's UF_6 conversion plant in Gore, Oklahoma. The Quivira Ambrosia Lake, New Mexico Uranium Mill will extract uranium from these residues and dispose of these wastes into the tailings pile. The uranium content of this alternate feed material is higher (0.61%) than the average ore processed in the United States, but the amount of residue processed to date is less than 3 day's production of byproduct material, when the Ambrosia Lake facility was in full production.

Example 3. Recovery of Uranium from Mine Water (Mine Water Cleanup).

NRC has authorized operation of ion-exchange units at mine sites, as an extension of the mill circuit by amendment of the uranium mill's source and byproduct material license. Instances include:

1. Western Nuclear, Inc.'s Split Rock uranium mill in Jeffrey City, Wyoming processed residues from the Green Mountain mine site ion-exchange water purification operations for the uranium content. The mine water was discharged under a National Pollutant Discharge Elimination System (NPDES) permit, and the combined residues were disposed of in the mill tailings pond.
2. Atlas Minerals Corporation's uranium mill in Moab, Utah processed ion-exchange residues from the dewatering operations at the Velvet mine site. The Velvet mine generated these residues in order to meet the requirements of an NPDES permit issued by EPA. An NRC license was not issued to the Velvet mine operation until the pregnant residues were brought to the Atlas mill for processing. The stripped residues were discharged to the mill tailings ponds, and the water was released under an NPDES permit from EPA.
3. Sequoyah Fuels Corporation's (now Rio Algom Corporation) research and development solution mining project in the South Powder River Basin, Wyoming, eluted ion-exchange columns from a nearby, company-owned mine site. The residues were discharged to onsite evaporation ponds along with resins from the in situ operation, which will be eventually cleaned up and disposed at a licensed uranium mill tailings site.

In the above cases, the NRC staff interpreted these "alternate feed materials" as being refined and/or processed ores (See 10 CFR Part 40, Section 40.4(k)). NRC regional counsel had suggested this interpretation of the regulations and the intent of the UMTCA (See Enclosure D). With this interpretation, the resultant wastes were legitimately classified as 11e.(2) byproduct material.

Such requests continue to be received by the NRC and by the Agreement States for the disposal of non-byproduct material into uranium mill tailings piles. The following general categories of non-byproduct material illustrate the requests submitted to the NRC and the Agreement States for disposal into uranium mill tailings piles licensed under authority established by Title II of UMTCA:

1. Mine Wastes.

In order to mine uranium or other source material ore from underground or open pit mines, operators frequently need to dewater the mine cavities. This results in quantities of mine water with suspended or dissolved constituents, some of which are source material. After processing the mine water to satisfy NPDES or other release requirements, the resultant clean mine water is then discharged offsite. The resulting water treatment sludge residues, in some cases, exceed the 0.05% licensable

limit for source material, but do not satisfy the 11e.(2) byproduct material definition, because they do not result primarily from extraction for the source material content.

The NRC and Agreement States have been contacted by licensees and waste generators regarding the possibility of disposing of such sludge residue directly into the tailings piles at licensed uranium mill tailings sites. NRC has indicated that such material does not constitute 11e.(2) byproduct material (See Enclosure E).

Requestors have also proposed processing the mine waste material through the uranium mill's circuit to remove the uranium product, prior to disposal into the tailings pile. NRC has modified licenses in the past to allow alternate feed materials to be processed on a case-by-case basis (See examples above). If the material can be classified as an ore and is processed for its source material content, the resultant waste is 11e.(2) byproduct material.

2. Secondary Process Wastes.

Frequently, natural ores which are processed for rare earths or other metals have significant concentrations of radioactive elements. Examples include copper, zirconium and vanadium ores. NRC has had requests to dispose of tailings resulting from processes to extract other metals into licensed uranium mill tailings piles. In some cases, secondary extraction of source material content has also been performed using other metal ore tailings, or a secondary processing operation has been added to the primary circuit. If the material can be classified as an ore and is processed through a mill, then the resultant waste is 11e.(2) byproduct material.

On the other hand NRC may not have regulatory authority over the wastes from secondary recovery operations, these wastes are normally returned to the primary recovery operation's circuit wastes. Examples of this are the Bingham Canyon, Utah sidestream operation and the Florida phosphate industry. In both cases, uranium is extracted in a secondary recovery operation, and the outflow wastes are combined with primary recovery wastes and disposed of outside of NRC regulatory authority.

However, the commingling of non-byproduct material with 11e.(2) byproduct material, without prior processing for the source material content, may pose some difficulties with eventual title transfer under the AEA, the Nuclear Waste Policy Act (NWPA) of 1982, Sections 151(b) and (c) provide options for Federal custody of these commingled wastes. However, the NWPA does not provide for a post-closure licensing supervision, as does the AEA. If the NRC were to routinely consider the direct disposal of such non-byproduct material at uranium mills, it would be advisable to request statutory modification of the AEA, Section 83 in order to allow such disposal to be treated as if the non-byproduct materials were AEA wastes under Section 83. In this case, the ownership and the RCRA considerations would be resolved.

3. Formerly Utilized Sites Remedial Action Program (FUSRAP).

These sites processed materials, such as monazite sands, to extract thorium for commercial applications. The Government contracts were for thorium source material used in the Manhattan Engineering District and early AEC programs. Some of the sites have disposal units which qualify as 11e.(2) byproduct material; in one case there is an NRC license (Stepan Chemical, Co., Maywood, New Jersey). The Department of Energy (DOE) is investigating options for disposal and control of these materials. DOE estimates a total of 1.7 million cubic yards of material located in 13 states. Recent proposals have considered transportation of FUSRAP materials from New Jersey to uranium mills in other states, such as Utah, Washington and Wyoming.

4. Naturally-occurring and Accelerator-produced Radioactive Material (NARM).

These wastes result from a wide range of operations, but are generally characterized by the fact that the AEA does not regulate them. In terms of disposal in uranium mill tailings ponds, the kinds of requests seen in the past include contaminated resins from ion-exchange well water purifying operations. There have also been inquiries regarding disposal of such things as construction scrap and radium-contaminated soil from old commercial operations. As mentioned previously, the NRC has approved such disposals on a very limited case-by-case basis in the past. The individual states usually administer the regulatory responsibility over NARM, but many other Federal agencies have jurisdiction responsibilities related to NARM. These include the Environmental Protection Agency (EPA), the Consumer Product Safety Commission, the Department of Health and Human Services, and the Department of Labor. There is a State licensed NARM disposal facility in Clive, Utah (Envirocare of Utah, Inc.).

E. MAJOR ITEMS TO BE ADDRESSED

Although cases have been proposed where technical, economical and societal advantages appear to encourage such disposal of radioactive material into tailings piles, there are some significant statutory and regulatory issues which appear to complicate such disposal:

1. Custody and title transfer.

UMTRCA, Title II, Section 202, (Section 83 of the AEA) stipulates that such title to the 11e.(2) byproduct material and to the land used for the disposal of 11e.(2) byproduct material shall be transferred to either the United States Government or to the State in which the land is located. UMTRCA goes on to identify the DOE, or any other agency designated by the President, to be the custodial agency for the U. S. Government. However, at its option, the State may elect to become the custodial licensee of the site following closure.

Past correspondence from DOE (Enclosure B) indicates DOE uncertainty regarding its authority to accept custodial transfer of tailings sites, where radioactive material, not constituting 11e.(2) byproduct material,

has been commingled. NRC staff have requested more specificity from DOE in a letter of October 5, 1989 (Enclosure C). As of this time, DOE has not yet responded.

The concern here is twofold:

- a. Any site where such commingling were to occur would need strong assurances or permission from either the State or DOE that eventual title and custody transfer would not be compromised.
- b. The license cannot be legally terminated, unless the custody and title has been transferred as stipulated in Section 83 b(1)(A) of the AEA. Commingling of wastes could complicate this transfer and, hence, the termination of the license.

As before, a partial resolution can be found in the NAPA, Section 151(b) and (c), provided certain statutory findings can be made. These provisions address DOE taking custody of low-level waste disposal sites. Section 151(c) specifically addresses sites where wastes resulting from extraction of rare earths, zirconium and hafnium from source material are disposed. The Commission can, furthermore, require the licensee to make available financial arrangements for long-term care under Section 151 a.(2), although the DT or the State are not identified as the long-term (perpetual) care licensees, as in the case of the AEA, Section 83 b.(5).

2. RCRA Authority and Mixed Waste.

Presently licensed facilities, where the tailings consist of uranium or thorium mill tailings and uranium or thorium ores, do not fall under the jurisdiction of RCRA. However, radioactive wastes (such as NARM), which are not source or byproduct material, are not exempted from RCRA. In any case, commingling RCRA-regulated wastes with tailings could result in the application of the EPA RCRA regulations and separate EPA permitting authority. The licensee would have to comply with EPA regulations, as well as AEA-related regulations.

It should be noted that NRC regulations in 10 CFR Part 40 (including Appendix A) have been revised to conform to the appropriate portions of EPA's RCRA regulations. The UMTRCA, as amended, stipulated that regulations for byproduct material be consistent with the Solid Waste Disposal Act (SWDA). The NRC has conformed the regulations of 10 CFR Part 40 to the appropriate provisions of the SWDA; i.e., RCRA provisions, on November 13, 1987. Having accomplished this, the AEA explicitly excludes byproduct material from RCRA. However, should source material compounds or mixtures, not in the form of uranium or thorium ores, be disposed of in the tailings piles, only the source material component of that compound or mixture — if the compound or mixture qualifies as "hazardous" — would be excluded from the provisions of RCRA.

If no hazardous wastes are identified, the commingled material could possibly be categorized as solid waste and be disposed of in a landfill

under the provisions of 40 CFR Part 241 (Guidance for the Land Disposal of Solid Waste).

3. Decision Whether or not to Process Material Prior to Disposal in the Tailings.

In some cases licensees have inquired whether processing radioactive waste as a feed material, prior to disposal into the tailings, would compromise the status of the resultant waste stream as 11e.(2) byproduct material. In those instances where NRC has allowed such processing to take place, the radioactive waste feed material was considered to be "refined and/or processed one." However, the radioactive waste feedstock itself was not considered to be 11e.(2) byproduct material. The source material content of the radioactive waste could be extracted so that the residual waste conformed to the definition of 11e.(2) byproduct material. These cases of processing have occurred in the past; e.g., processing of slurry waste from Sequoyah Fuels UFs Plant in Gore, Oklahoma at the Quivira Uranium Milling Facility in Ambrosia Lake, New Mexico. (See the discussion in Section D.)

Other licensees have requested that the waste material be disposed of directly into the tailings pile without processing. This disposal has been justified because the material is similar in chemical, physical and material content to the tailings. Its addition would, most likely, not affect reclamation or alter the impact to the environment. Although such material may not qualify as 11e.(2) byproduct material, in some cases it could be processed as an alternate feed material, which would result in an 11e.(2) byproduct material waste.

However, should the uranium mill operator accept source material waste from other persons for direct disposal (that is, without extracting the source material content), the mill operator may need to satisfy 10 CFR Part 61 or equivalent State license requirements, or else seek an exemption from 10 CFR Part 61. Commercial disposal of low-level radioactive waste is governed by Part 61, and the licensee would, short of an exemption, need to maintain licensed status under 10 CFR Parts 40 and 61.

F. DISCUSSION OF DISPOSAL WITHOUT PRIOR PROCESSING

There are currently only two basic choices for the NRC to make with respect to the direct disposal of non-byproduct material into uranium or thorium mill tailings piles. One is to prohibit entirely any disposal of radioactive material that is not 11e.(2) byproduct material. That position is based on a very strict reading of the AEA, which allows no flexibility to commingle.

The other choice is to allow some commingling of non-byproduct material with uranium or thorium mill tailings under criteria that satisfy current regulatory constraints and guidance (See Enclosure A). In the event that a licensee does request approval under the current regulatory framework, NRC could authorize routine disposals in uranium or thorium mill tailings piles with some limiting criteria. These criteria would include:

1. There are no significant additional impacts to the public safety, health and the environment.
2. The reclamation of the tailings impoundment will not be compromised. In effect, the reclamation and closure criteria in 10 CFR Part 40, Appendix A would be complied with.
3. There are no RCRA or Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) problems.*
4. The DOE or the State agrees to take title to the site upon completion of the reclamation.

The licensee would need to obtain the necessary assurance from DOE with respect to guideline 4, prior to requesting any such license amendments from NRC to allow disposal of non-byproduct material in the tailings pile. In past practice, the NRC staff has also identified other factors, which should play a role in the generator and/or licensee's evaluation of disposal alternatives. These include:

- o The volume of non-byproduct waste does not exceed the volume of 11e.(2) byproduct material.
- o Other commercial disposal alternatives have been evaluated.
- o There is sound justification for the commingling from the standpoint of furthering the national program for safe disposal of all radioactive wastes.

There are numerous uranium mill tailings piles, which have sufficient capacity to serve as disposal sites for similar non-byproduct waste material. Under most conditions, the NRC staff does not have significant health, safety or environmental concerns associated with commingling.

At present the NRC considers any request to dispose of non-byproduct material at a uranium mill on a case-by-case basis. The onus in trying to make a case for any single commingling rests with the licensee/owner of the subject tailings pile. The licensee must obtain the necessary approvals from EPA with respect to any hazardous waste and the legal views from the State or DOE, which allow site custody and title transfer. The process of obtaining such approvals and the potential legal complications may prove to be too onerous for uranium recovery licensees to consider direct disposal, without prior processing.

The choices for resolving regulatory or licensing issues include:

1. Continue with the present policy.

*In effect, this would only allow source material, which is not mixed waste. Categories excluded would be mixed waste source material, mixed waste NARM and NARM which is not mixed waste.

2. Negotiate a memorandum of understanding (MOU) between interested parties.
3. Issue policy directive or orders.
4. Initiate a rulemaking to address the issue.
5. Request for legislative change.

Since the fundamental problem stems directly from the legislation (Section 83 b(1)(A) of the AEA), there is little point in solely pursuing 2, 3, 4 or any combination thereof. Furthermore, options 2 and 3 do not have the legal standing that a regulation or a law has. The NRC staff continues to consider proposals for direct disposal into uranium mill tailings piles on a case-specific basis under the criteria discussed above. However, the NRC staff expects that such comingling requests will continue to be proposed and as a result, a long-range solution should be sought. Such a solution would likely involve a combination of alternatives 1, 4 and 5 above. Until the law could be changed and the ensuing rule could be promulgated, the NRC would still continue with the present policy to consider requests on a case-specific basis.

It should be noted that the scope of this paper is limited to options involving comingling with existing tailings impoundments. Outside of such a course of action there are numerous alternatives. These include:

- o Co-locating a disposal site adjacent to, but not contiguous with, the tailings impoundment. This may require obtaining a license or permit from the NRC, EPA or the State depending on the non-byproduct material and the disposal strategy; e.g, if it constitutes source material, a 10 CFR Part 61 license will be necessary.
- o Applying for an NRC license under 10 CFR Part 61 or equivalent Agreement-State regulations. This option would involve an exemption to Part 61 in order to allow 11e.(2) byproduct material to be disposed of at an NRC or Agreement State licensed commercial disposal facility. The NRC is presently evaluating such an application for an 11e.(2) disposal facility in Utah.
- o Applying for a permit from a State to dispose of naturally-occurring and accelerator-produced radioactive material (NARM). The applicant should note that EPA is in the process of rulemaking to regulate NARM under its Toxic Substances Control Act (TSCA) authority (40 CFR Part 764).
- o If the radioactive waste is not classified as hazardous and if it can be defined as a solid waste, then it can be disposed of in a landfill under the provisions of 40 CFR Part 241 (Guidance for the Land Disposal of Solid Waste).

These are all options available to the owner/generator of such waste, without significant Commission policy or regulatory modification. That being the case, the paper does not address these options. However, the applicant for a comingling disposal should consider these other options and determine that they offer no reasonable solution.

G. RESULTS OF THE NRC STAFF ANALYSIS

In light of the above discussion, the NRC staff identified the following courses of action with respect to requests for direct disposals:

1. Treat proposals on a case-by-case basis, subject to criteria outlined in the previous section (Also Enclosure A).

This is the present approach being used by NRC to evaluate commingling proposals involving non-byproduct material at NRC-licensed uranium and thorium mills. But, the process for complying with those criteria could be simplified, if some steps were taken to facilitate commingling of byproduct and non-byproduct material wastes. Federal action to clarify the regulatory framework could be taken by negotiating a memorandum of understanding (MOU), or separate MOUs, with EPA, DOE and the State(s), which would specify explicit conditions under which such commingling at uranium mill tailings sites would be acceptable.

2. Request statutory authority to allow commingling under at the Commission's discretion without compromising a tailings site's custody or title transferability or introducing multiple overlapping EPA regulatory authority.

This would clarify Congress' intent in UMTRCA and would hopefully provide a uniform national policy to limit the number of low-radioactivity disposal sites. This legislative change may need to be reflected in NRC and EPA regulations. The NRC rulemaking would implement the legislative change to provide generic discretion to the Commission for such commingling applications. Such discretion would be expressly reserved to the Commission by modification to 10 CFR Part 150, §150.15(a). Since this process can be time consuming, the NRC would still proceed with item 1 above.

In the case of processing alternative feedstocks for uranium and thorium mills, the staff concluded that a definition of ore, in conjunction with the AEA's definition of byproduct material, would resolve the uncertainty in the present regulatory framework. The NRC would initiate a rulemaking to establish in 10 CFR Part 40, a definition of ore in conjunction with the definition of byproduct material as follows: "For the purposes of this part, ore means a natural or native matter that may be mined and treated for the extraction of any of its constituents or any other matter from which source material is extracted in a uranium or thorium mill."

ENCLOSURE A

JUL 27 1988

MARTIN DS 6/16

- 1 -

MEMORANDUM FOR: Robert D. Martin, Regional Administrator
Region IV

FROM: Hugh L. Thompson, Jr., Director
Office of Nuclear Material Safety
and Safeguards

SUBJECT: DISPOSAL OF NON-BYPRODUCT MATERIALS IN TAILINGS
IMPOUNDMENTS

In your February 23, 1988 memorandum, you requested a policy decision on the disposal of non-byproduct waste materials (NARM and other wastes) in mill tailings impoundments. To facilitate our review, we used the two categories of wastes discussed in your memorandum. These categories are: (1) NARM wastes, those generated by operations not regulated under the Atomic Energy Act (the Act) and (2) other wastes, those generated by operations regulated under the Act. Neither of these waste categories is included in the legislative definition of byproduct material.

The major regulatory issues discussed in your memorandum and noted below would have to be favorably resolved before the NRC could consider approving the disposal of the NARM category of waste in mill tailings impoundments under current statutory authority. The statutory authority is unlikely to change in the near future. Therefore, we agree with your recommendation that NRC not approve a policy of disposal of material in the NARM category of waste in mill tailings impoundments.

The primary issue is whether the inclusion of NARM wastes in a mill tailings disposal site is consistent with U.S. Government ownership (or State ownership) and other authorities under Section 83 of the Act. Since the Department of Energy (DOE) is currently designated to take title to the mill tailings sites, NRC requested DOE's view on this question. DOE's response stated that DOE has doubts about its authority to take title to the mill tailings disposal sites if NRC has allowed the commingling of NARM (non-byproduct) materials in the impoundments (a copy of the DOE response is attached).

As noted in your request, NRC does not have authority to regulate NARM. Therefore, disposal of NARM in tailings impoundments would result in a commingling of regulated and unregulated materials in the same disposal unit. This could create duplicative jurisdiction between NRC and other Federal or State agencies with respect to the commingled radioactive materials. Moreover, if NARM waste constituents were to violate the current standards (e.g. migrate into ground water), the Commission's authority under Section 84c of the Act to approve alternatives to requirements for disposal or reclamation would be seriously impaired.

Additionally, the wastes may be subject to presently applicable Resource Conservation and Recovery Act (RCRA) regulations or other U.S. Environmental Protection Agency (EPA) rules for hazardous constituents or NARM, as well as to applicable State requirements. If the waste results from a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) clean-up

action, the EPA requirements required to be met would also need to be considered by the licensee to ensure that there is no issue regarding suitability of the site for disposal of the CERCLA wastes. The appropriate regulatory authorities would have to address these requirements.

Finally, since there is currently a NARM disposal site licensed by the State of Utah and a license application under review in the State of Colorado, there appears to be no compelling need at this time to dispose of NARM material in uranium mill tailings impoundments.

The other waste category includes waste materials generated from several different types of licensee activities regulated under the Act. Although these wastes do not meet the legislative definition of "byproduct material," we agree from a policy and technical standpoint with your proposal that their disposal in tailings impoundments should be considered on a case-by-case basis, provided the volume of material is not large when compared to the existing tailings in the impoundment. With respect to the land transfer issue, the DOE in its letter of June 10, 1988 stated that it would be willing to discuss this in more detail on a site-specific basis. Additionally, for the other waste category, the other issues appear to be more amenable to resolution on a case-by-case basis. Therefore, if NRC can make a finding that (1) there is no significant environmental impact, (2) the reclamation of the impoundment will not be impacted, (3) there are no RCRA or CERCLA problems, and (4) the DOE agrees to take title to the site upon completion of the reclamation, then NRC could authorize such a disposal.

In our view, it is the applicant's responsibility to demonstrate that these four points have been met. This demonstration should include reaching the appropriate agreements with EPA, DOE, and the State. The NRC should not take on this responsibility for the applicant.

(Signed) Robert M. Bernero



Hugh L. Thompson, Jr., Director
Office of Nuclear Material Safety
and Safeguards

Enclosure:

DOE letter dated June 10, 1988



Department of Energy
Washington, DC 20548

JUN 10 1988

Mr. Richard L. Bangart, Acting Director
Division of Low-Level Waste Management
and Decommissioning
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Bangart:

This is in response to M. R. Knapp's letter of April 14, 1988, to the Department of Energy regarding the Department's acceptance of transfer of ownership of licensed uranium mill tailings impoundments if non-byproduct materials were also disposed there.

While the Department supports the Nuclear Regulatory Commission's efforts to find permanent disposal sites for these materials, it is not clear that the Department would have the authority under Section 83 of the Atomic Energy Act to accept custody of non-byproduct materials. Congressional action may be needed to provide an unambiguous resolution on this issue.

Assuming some means of resolving the authority question was achieved, the prior satisfaction of all Resource Conservation and Recovery Act (RCRA) and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, requirements would be essential. Appropriate financial arrangement would have to be provided so that the Department would bear no additional cost associated with the acquisition of this material.

Your letter indicated that there are three pending applications before the Commission for the disposal of non-byproduct material at licensed uranium mill tailings sites. We also understand there may be different materials in question; some ("HARM") clearly outside of NRC jurisdiction and some ("secondary" recovery waste) within NRC jurisdiction. We would be willing to discuss this in more detail, if you desire, with respect to specific material at specific sites.

Sincerely,

John E. Baublitz

John E. Baublitz
Acting Director
Office of Remedial Action
and Waste Technology
Office of Nuclear Energy

1038/

ENCLOSURE B

ENCLOSURE C

OCT 05 1989

Mr. John E. Baublitz, Acting Director
Office of Remedial Action
and Waste Technology
Office of Nuclear Energy
U. S. Department of Energy
Washington, D.C. 20545

Dear Mr. Baublitz:

I am writing to you because of a number of requests made to NRC regarding the disposal of select wastes in uranium mill tailings piles. The requests vary in terms of quantity, radioactivity, and presence of other nonradiological constituents.

Aside from technical, environmental and engineering considerations, one of the most significant considerations in whether to permit such disposal is the eventual transfer of the title and custody from the commercial licensee/owner to the State or Federal government. It has been suggested that the disposal of such wastes in a uranium or thorium tailings pile may compromise the authority for transfer of title and custody to the United States under Section 83 of the Atomic Energy Act (AEA) of 1954, as amended.

Presently, the Department of Energy (DOE) is identified as the Federal agency to accept, on behalf of the Federal government, title and to conduct long-term monitoring and surveillance in perpetuity. This role is similar to DOE's responsibility in the UMTRA Project under Title I of the Uranium Mill Tailings Radiation Control Act (UMTRCA), specifically Section 104(f).

In our April 14, 1988 letter to you, the NRC requested a determination on whether DOE would accept custody of tailings sites, if Naturally Occurring and Accelerator Produced Radioactive Material (NARM) had been disposed therein. Your June 10, 1988 response raised doubts about DOE's authority to accept title to and custody of such sites.

In order to improve the currently inefficient approach of reviewing each request for tailings pile disposal of nonbyproduct material on a case-by-case basis, additional DOE clarification is needed to remove the uncertainty that now exists. A more definitive DOE position would allow NRC to provide clarifying guidance to licensees, eliminate requests for disposal that would result in DOE being prohibited from accepting title and custody, and allow NRC to more expeditiously review requests that are consistent with DOE criteria for eventual title and custody acceptance. Your timely response to this request will significantly assist all parties involved. I request clarification regarding the following:

1. Are there any quantities or concentrations of NARM that could be disposed of in the tailings piles without compromising DOE's ability to eventually accept title to and custody of the reclaimed tailings site? If so, please identify these quantity or concentration limits.
2. Likewise, are there any such quantity or concentration limits on accepting title and custody transfer of sites wherein matter with a source material content may be disposed of? Specifically, if such source material were to be placed in tailings piles without having processed it for the source material content, would DOE have reservations depending on quantities or concentrations? For example, the Teledyne Wah Chang zirconium tailings or filtercake residue from mine water cleanup are two examples where such material has been suggested for direct disposal into existing, licensed uranium mill tailings piles.
3. Formerly Utilized Sites Remedial Action Program (FUSRAP) material has been proposed for disposal into uranium mill tailings piles, without any processing. In some cases, this material qualifies as 11.e(2) byproduct material, but in others there are quantities of this material containing constituents specifically covered under the Resource Conservation and Recovery Act (RCRA) or the Toxic Substances Control Act (TSCA). Can such material, or limited quantities or concentrations of this material, be placed directly into a uranium mill tailings pile without compromising the transferability of the title and custody to DOE upon reclamation?
4. Mine wastes and mine water, which cannot be released into waterways or on open ground, is usually treated to remove those contaminants in order to comply with National Pollutants Discharge Elimination System (NPDES) limits for such releases. As a result, the residues from the treatment process must be disposed of properly. If such water or residues are then processed for their source material content, either at the uranium mill or off site, can the resultant material be disposed of in the tailings piles without compromising DOE's authority or willingness to take title to and custody of the reclaimed tailings pile?
5. Some materials, which have been processed for extraction of certain economically valuable minerals, have been additionally processed for source material as well. These "secondary wastes" have been referred to as NARM, source material, select wastes and so on. Frequently, these wastes are almost indistinguishable from uranium mill tailings. They are not byproduct material simply because some mineral, such as vanadium or copper, has been extracted prior to being processed for uranium or thorium, usually in another facility other than a uranium

mill. FUSRAP, NARM and the phosphate tailings in Florida and Louisiana may fall under this category. Are there any conditions, under which such material could be disposed of into tailings, which would not compromise DOE's ability to take title and custody upon reclamation?

Should your staff have any questions regarding this letter, contacts are Paul Lohaus (FTS 492-0553) or Giorgio Gnugnoli (FTS 492-0578).

Sincerely,

(SIGNED) RICHARD L. BANGART

Richard L. Bangart, Director
Division of Low-Level Waste Management
and Decommissioning, NMSS

cc: S. Mann, DOE/NE-22
M. Matthews, DOE/AL

MAR 16 1990

Roger P. Whitfield, Associate Director
Office of Environmental Restoration
Office of Environmental Restoration
and Waste Management - EM-40
U. S. Department of Energy
Washington, D.C. 20545

Dear Mr. Whitfield:

I am writing to you regarding the October 5, 1989, NRC letter I sent to Jack Baublitz (copy enclosed). In that letter I described five situations where proposals have been made to dispose of certain types of radioactive wastes in licensed commercial uranium mill tailings piles. My staff is preparing a policy paper for the Commission regarding such disposals. Clarification of DOE's position on acceptance of site title and custody is essential in this effort.

I believe the recent meeting between members of our staffs on February 28, 1990, was a positive step forward in establishing a mutually-acceptable protocol for such disposals. I welcome such efforts at cooperation and encourage continuation of this level of coordination in the future.

In order for us to plan more effectively in dealing with requests for such disposals, I would appreciate receiving information about the status of your efforts to provide such clarification and an estimate of the date by which you can fully respond to my October 5, 1989, letter. We encourage any possible efforts that you could undertake to assign a higher priority to this task.

If you or your staff have any questions regarding this letter, please contact Paul Lohaus (FTS 492-0553) or Giorgio Gagnoli (FTS 492-0578) of my staff.

ORIGINAL SIGNED BY
Richard L. Bangart, Director
Division of Low-Level Waste Management
and Decommissioning, NMSS

Enclosure: As stated
cc: S. Mann, DOE/EM-451
M. Matthews, DOE/AL
J. Gatrell, DOE/EM-451

OCT 05 1989

Mr. John E. Baublitz, Acting Director
Office of Remedial Action
and Waste Technology
Office of Nuclear Energy
U. S. Department of Energy
Washington, D.C. 20545

Dear Mr. Baublitz:

I am writing to you because of a number of requests made to NRC regarding the disposal of select wastes in uranium mill tailings piles. The requests vary in terms of quantity, radioactivity, and presence of other nonradiological constituents.

Aside from technical, environmental and engineering considerations, one of the most significant considerations in whether to permit such disposal is the eventual transfer of the title and custody from the commercial licensee/owner to the State or Federal government. It has been suggested that the disposal of such wastes in a uranium or thorium tailings pile may compromise the authority for transfer of title and custody to the United States under Section 83 of the Atomic Energy Act (AEA) of 1954, as amended.

Presently, the Department of Energy (DOE) is identified as the Federal agency to accept, on behalf of the Federal government, title and to conduct long-term monitoring and surveillance in perpetuity. This role is similar to DOE's responsibility in the UNTRA Project under Title I of the Uranium Mill Tailings Radiation Control Act (UMTRCA), specifically Section 104(f).

In our April 14, 1988 letter to you, the NRC requested a determination on whether DOE would accept custody of tailings sites, if Naturally Occurring and Accelerator Produced Radioactive Material (NARM) had been disposed therein. Your June 10, 1988 response raised doubts about DOE's authority to accept title to and custody of such sites.

In order to improve the currently inefficient approach of reviewing each request for tailings pile disposal of nonbyproduct material on a case-by-case basis, additional DOE clarification is needed to remove the uncertainty that now exists. A more definitive DOE position would allow NRC to provide clarifying guidance to licensees, eliminate requests for disposal that would result in DOE being prohibited from accepting title and custody, and allow NRC to more expeditiously review requests that are consistent with DOE criteria for eventual title and custody acceptance. Your timely response to this request will significantly assist all parties involved. I request clarification regarding the following:

1. Are there any quantities or concentrations of NARM that could be disposed of in the tailings piles without compromising DOE's ability to eventually accept title to and custody of the reclaimed tailings site? If so, please identify these quantity or concentration limits.
2. Likewise, are there any such quantity or concentration limits on accepting title and custody transfer of sites wherein matter with a source material content may be disposed of? Specifically, if such source material were to be placed in tailings piles without having processed it for the source material content, would DOE have reservations depending on quantities or concentrations? For example, the Teledyne Wah Chang zirconium tailings or filtercake residue from mine water cleanup are two examples where such material has been suggested for direct disposal into existing, licensed uranium mill tailings piles.
3. Formerly Utilized Sites Remedial Action Program (FUSRAP) material has been proposed for disposal into uranium mill tailings piles, without any processing. In some cases, this material qualifies as 11.e(2) byproduct material, but in others there are quantities of this material containing constituents specifically covered under the Resource Conservation and Recovery Act (RCRA) or the Toxic Substances Control Act (TSCA). Can such material, or limited quantities or concentrations of this material, be placed directly into a uranium mill tailings pile without compromising the transferability of the title and custody to DOE upon reclamation?
4. Mine wastes and mine water, which cannot be released into waterways or on open ground, is usually treated to remove those contaminants in order to comply with National Pollutants Discharge Elimination System (NPDES) limits for such releases. As a result, the residues from the treatment process must be disposed of properly. If such water or residues are then processed for their source material content, either at the uranium mill or off site, can the resultant material be disposed of in the tailings piles without compromising DOE's authority or willingness to take title to and custody of the reclaimed tailings pile?
5. Some materials, which have been processed for extraction of certain economically valuable minerals, have been additionally processed for source material as well. These "secondary wastes" have been referred to as NARM, source material, select wastes and so on. Frequently, these wastes are almost indistinguishable from uranium mill tailings. They are not byproduct material simply because some mineral, such as vanadium or copper, has been extracted prior to being processed for uranium or thorium, usually in another facility other than the uranium mill.

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mill. FUSRAP, NARM and the phosphate tailings in Florida and Louisiana may fall under this category. Are there any conditions, under which such material could be disposed of into tailings, which would not compromise DOE's ability to take title and custody upon reclamation?

Should your staff have any questions regarding this letter, contacts are Paul Lohaus (FTS 492-0553) or Giorgio Gnugnoli (FTS 492-0578).

Sincerely,
(SIGNED) RICHARD L. BANGART
Richard L. Bangart, Director
Division of Low-Level Waste Management
and Decommissioning, NRCSS

cc: S. Mann, DOE/NE-22
M. Matthews, DOE/AL

ENCLOSURE D

SEP 14 1989

MEMORANDUM FOR: Robert M. Bernero, Director
Office of Nuclear Material Safety & Safeguards

FROM: John M. Montgomery
Acting Regional Administrator

SUBJECT: ACCEPTANCE OF SOURCE MATERIAL AT URANIUM MILLS FOR
PROCESSING AND DISPOSAL

On June 27, 1989, a meeting was held in Region IV with representatives of the State of Utah and NRC concerning the regulatory jurisdiction over source material. The meeting was the result of a number of discussions over the past several months due to receipt of Teledyne Wah Chang source material from Oregon for processing and disposal at the UMETCO White Mesa uranium mill near Blanding, Utah.

The Wah Chang material is a waste stream from the production of zirconium and contains recoverable amounts of uranium in excess of one-twentieth of 1 percent (0.05 percent) of the mixture. UMETCO is requesting authorization to process this source material through their mill with the resulting byproduct material being disposed of in the tailings impoundment pile. It is the understanding of the State of Utah that UMETCO will be compensated both by retention of the produced uranium and a tare payment by Wah Chang.

Utah has objected to NRC authorizing UMETCO to process this material. Their contention is that the actual purpose is to dispose of this material in the tailings pile under the guise of reprocessing it, as evidenced by the method of compensation. In addition, they also contend, based on their Agreement State agreement with NRC, that the Commission discontinued its regulatory authority in Utah with respect to source materials except where the Commission retained regulatory authority and responsibility with respect to regulation of (a) the extraction or concentration of source material from "source material ore" and the management and disposal of the resulting byproduct material as well as (b) the land disposal of source, byproduct and special nuclear material received from other persons. The primary issue with respect to (a), above, being whether the Wah Chang material is "source material ore."

PAC

Shipment of the waste material to the site falls under DOT authority and, once received onsite, the material is under NRC authority. Therefore, the remaining issue is the question of NRC authority to consider introduction of this material into the mill process as source material ore. Neither "source material ore" nor "ore" by itself is defined in the Atomic Energy Act of 1954, as amended (the Act), or the Commission's regulations.* However, one of the meanings of the term "ore" as set forth in Webster's Third New International Dictionary is "a source from which valuable material is extracted."** If this were considered a secondary recovery operation, the resultant waste material could properly be classed as byproduct material and disposed of in the tailings pile.

For UMETCO, any act on their request is pending NRC determination that the material would not be classified as a mixed waste. Chemical analyses revealed some constituents that may cause the waste to fall under CERCLA/RCRA regulations. UMETCO is presently working with EPA and Wah Chang to get that question resolved. Wah Chang has suspended shipments of the material to UMETCO until all the issues are resolved. Of the total estimated volume of about 8000 cubic yards, approximately 2000 cubic yards were delivered. Relative to the volume of mill tailings in the pile, this Wah Chang waste is negligible.

The policy or precedent-setting issue that requires resolution is NRC's position regarding licensees accepting this type of material for processing at NRC-regulated uranium mills. Preliminary discussions were held with Paul Lohaus of the Operations Branch, Low-Level Waste and Decommissioning Division, NMSS, on June 28, 1989, and again on August 10, 1989, with Paul Lohaus, Mike Fliegel and John Greeves.

This is not the first time that NRC has received inquiries about the processing of previously processed material through uranium mills. These inquiries have ranged from scrap and wastes resulting from demolition of NARM contaminated buildings, to the Denver radium wastes, to raffinate pond residue from the Sequoyah Fuel Company facility at Gore, Oklahoma. As you are aware, we have also recently received inquiries about disposal (not processing) of the sludge resulting from uranium/radium removed from mine water at a uranium mine. Related to this same case, the Bureau of Indian Affairs (BIA) has recently stated that one reason for the Spokane Indian Tribe to take over the Sherwood, Washington Mill is to process this same mine water through the mill, with the resultant waste going to the tailings impoundment.

* "Unrefined and unprocessed ore" is defined in 10 CFR 40.4 to mean ore in its natural form prior to any processing such as grinding, roasting or beneficiating, or refining. It is our understanding that this term was defined for its use in Part 40.13.

** It is worth noting that Byproduct Material is defined in Part 40.4 and in Section 11.e.(2) of the Act as meaning "the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content..." (emphasis added).

Another case of interest to Utah is the radioactive soil from Maywood, New Jersey (which has been defined by DOE as "byproduct material"). We understand that some interest has been expressed in disposing of this material at Plateau Resources Limited's Shootaring Canyon Mill at Ticaboo, Utah. This was also the subject of a letter from Congressman Wayne Owens of Utah to Chairman Carr. If this material meets the definition of byproduct material, we may be faced with a situation where the volume of material to be disposed is roughly 10 times the volume of mill tailings at the site. Our policy in the past has been to allow disposal of byproduct generated offsite in a mill tailings pile if the volume was small in relation to the volume of mill tailings. If the material is not byproduct material, as defined in Section 11.e.(2) of the Act, it may not be disposed of in the tailings pile without specific agreement from DOE that they would accept the site after license termination.

For the case of the contaminated scrap resulting from NARM contaminated buildings, our response was that such material was not acceptable because its physical nature would not allow processing through the mill and, furthermore, the source material content was negligible. For the Sequoyah Fuels Company raffinate pond material, it was determined that it was permissible to process it as "refined and processed ore" (copy of memo enclosed). In another case, NRC authorized a mill to elute some ion exchange columns and to dispose of the spent resins. For this case, the ion exchange columns were being used at domestic wells on the Navajo reservation to strip naturally occurring radium. The action was considered as a public service since there was no place reasonably close to dispose of the material, and the volume was minuscule in comparison to the mill tailings. There are other cases, but these are typical of the inquiries we have received.

As can be seen, NRC has dealt with the issue of the processing and disposal of material other than unrefined and unprocessed ore on a case-specific basis. However, it is clear that guidance is needed so that both the Wah Chang issue and all future requests are handled consistently. Accordingly, we suggest that what material may be accepted for disposal at a uranium mill tailings site be developed into a general NRC policy statement. We will be happy to assist in this development. Because of the continuing interest, including the licensees who foresee a potential for producing revenue, this policy statement should be developed as soon as feasible.

Original Signed By

John M. Montgomery
Acting Regional Administrator

JUL 30 1987

URFO:PJG
Docket No. 40-8905
SUA-1473, Amendment No. 3
04008905180E

MEMORANDUM FOR: Docket File No. 40-8905
FROM: Pete J. Garcia, Project Manager
Licensing Branch 2
Uranium Recovery Field Office, Region IV
SUBJECT: AMENDMENT NO. 3 TO SOURCE MATERIAL LICENSE SUA-1473
FOR THE AMBROSIA LAKE MILL

Introduction

By letter dated March 31, 1987, Quivira Mining Company (Quivira) requested amendment of Source Material License SUA-1473 for the Ambrosia Lake Mill to authorize processing of alternate feed material. This material, which averages 0.61 percent uranium, is a residue generated during a yellowcake purification process at Sequoyah Fuels Corporation's UF₆ Conversion Plant at Gore, Oklahoma. Quivira provided additional information by letters dated July 15, 1987, to NRC, and June 9, 1987, to the New Mexico Environmental Improvement Division with a copy to NRC.

The proposed action is to authorize Quivira to process the alternate feed material from the Gore facility. A more complete description of the licensee's proposal and a summary of the staff's review is provided below.

Licensee Proposal

The licensee states that the alternate feed material in slurry form will be transported to the mill in DOT-approved tanker trucks. The slurry will be unloaded at a covered receiving station which will be constructed near the thickener circuit. The slurry will be pumped from the tanker trucks into thickener tanks. The location of the receiving station and

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JUL 30 1987

- 2 -

the thickener tanks is shown on Figure 1 of the licensee's March 31 submittal.

A flow diagram of the process to be utilized to recover the uranium is shown on Figure 2 of the July 15 submittal. The slurry will be washed in the thickeners. The thickened slurry will then be fed into leach tanks for addition of sulfuric acid. This step will be identical to the normal mill process step with the exception that an oxidant will not be required due to the ferric iron content of the slurry. The remaining major process steps consist of solvent extraction and precipitation. The text of the licensee submittal indicates that the precipitated yellowcake may be kept in slurry form or dried. However, Figure 2 of the July 15 submittal indicates that the yellowcake will be left in slurry form. The wash solution, along with barren raffinate solution from the solvent extraction process step, will be pumped directly to synthetically-lined evaporation ponds. Tailings will be discharged into Tailings Impoundment 2.

Quivira estimates that approximately 16,000 tons of residue will be shipped to the Ambrosia Lake Mill for processing. The results of chemical and radiological analyses of the alternate feed material and the wash water are shown on Tables 1, 2, and 3 of the licensee's March 31 submittal. A table showing the composition of the raffinate solution and the solution in the evaporation ponds is provided in the June 9 submittal.

Finally, Quivira proposed no changes to their existing in-plant radiation safety program. Quivira states that the existing programs are adequate to evaluate radiological impacts and states that existing operating procedures will be followed for all aspects of the radiation safety program.

Staff Evaluation

The staff reviewed the licensee's proposal to determine whether it would result in a significant impact to the environment or the current tailings management, environmental monitoring, and radiation safety programs.

As stated previously, Quivira estimates that approximately 16,000 tons of residue will be processed at the mill. This amount constitutes only 3 days of milling at the mill's rated capacity of 6,500 tons per day. Further, the tailings impoundment system at the Ambrosia Lake Mill currently contains more than 33 million tons of tailings. The additional

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material will therefore constitute a miniscule percentage of the final volume of tailings resulting from operations at the Ambrosia Lake sites and will not have a significant impact on the capacity or final reclamation of the tailings disposal system.

Quivira states that the residue wash water and the barren raffinate solution will be pumped to lined evaporation ponds. The solid residue resulting from the uranium extraction process, which will be repulped using mine water or solutions resulting from processing regular ores for pumping to the unlined tailings pond, will contain only the insoluble component of the constituents comprising the residue. The effect on seepage from tailings pond 2 should therefore be minimal. A comparison of the evaporation pond solution with the wash and raffinate solutions shows that the solutions are very similar. The only constituent which is present in significantly higher concentrations in the alternate feed process solutions is nitrate (NO_3). A review of the ground-water monitoring program currently in effect for the evaporation ponds indicates that NO_3 is included in the list of parameters for sample analysis. In addition, no evidence of seepage has been detected to date from any of the lined ponds to be used for evaporation. The staff concludes that the processing of the alternate feed material will not impact the ground-water programs currently in effect for the Ambrosia Lake Mill.

The licensee has not proposed changes to the radiation safety program already in effect at the Ambrosia Lake Mill. Since the feed material will be handled exclusively in a wet form, no increase in airborne radioactivity is expected. The staff concludes that the mill's existing radiological monitoring program and operating procedures will be adequate to determine and minimize worker exposures resulting from the proposed activity.

Conclusions

Section 40.4(a-1) defines byproduct materials as "the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content." Section 40.4 does not provide a definition for the singular term "ore." It does, however, provide a definition for "unrefined and unprocessed ore," which means "ore in its natural form prior to any processing." The "feed material" (itself source material) that Quivira proposes to reprocess is very similar to conventional ore. However, it does not constitute an "unrefined and unprocessed ore." Thus, it is logical and

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consistent with the public health, safety and welfare purposes of the Uranium Mill Tailings Radiation Control Act of 1978, as well as the Commission's implementing regulations, to conversely treat such material as refined and processed ore. Such ore will be reprocessed for its more refined source material content and the resulting tailings or wastes will therefore be byproduct material which is subject to Commission regulation. To hold differently would be to hold to an interpretation that would leave the resultant tailings from the reprocessed feed material as unregulated material. Such an interpretation would be contrary to the clear intent of the Mill Tailings Act.

The staff therefore recommends that Source Material License SUA-1473 be amended to authorize processing of the alternate feed material from the Gore facility by adding License Condition No. 31 to read as follows:

31. The licensee is authorized to process alternate feed material from Sequoyah Fuels Corporation's Gore, Oklahoma facility in accordance with the submittals dated March 31 and July 15, 1987.

15/
Pete J. Garcia, Project Manager
Licensing Branch 2
Uranium Recovery Field Office
Region IV

Approved by:

15/
Harry J. Pettengill, Chief
Licensing Branch 2
Uranium Recovery Field Office, Region IV

Case Closed: 04008905180E

ENCLOSURE E

JUN 20 1989

Terry R. Strong, Head -
Office of Radiation Protection
Department of Social and Health Services
Mail Stop LF-13
Olympia, Washington 98504

Dear Mr. Strong:

This is in response to your March 29, 1989 Technical Assistance Request concerning the disposal of residue, in the form of filter-cake, at the Dawn Milling Company's mill site tailings pond. Enclosure 1 is a memorandum from the Division of Low-Level Waste Management (LLWM) which addresses the questions raised in your Technical Assistance Request. In brief summary two areas are addressed:

1. Since the filter-cake residues are not produced by extraction or concentration of uranium or thorium from ore processed primarily for its source material content these residues do not constitute byproduct material.
2. The placement of the filter-cake residues into the Dawn Mining Company's uranium mill tailings pile may impact the transfer of the site to the Federal government for long-term surveillance and care.

Also, please note that the disposal of the filter-cake residues at the Dawn Milling Company's mill site tailings pond could cause the byproduct material at the tailings pond to be considered mixed waste if the residue contains hazardous waste. Enclosure 2 is a letter that NRC sent to its uranium recovery licensees that addressed mixed waste.

original signed by Vandy L. Miller

Vandy L. Miller, Assistant Director
for State Agreements Program
State, Local and Indian Tribe Programs

Enclosures:
As stated

: :

: :

: :



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

ENCLOSURE 1

MAY 15 1989

MEMORANDUM FOR: Vandy L. Miller, Assistant Director
for State Agreements Program
State, Local and Indian Tribe Programs

FROM: Paul H. Lohaus, Chief
Operations Branch
Division of Low-Level Waste Management
and Decommissioning, NMSS

SUBJECT: TECHNICAL SUPPORT TO GPA/SLITP ON STATE OF WASHINGTON
REVIEW OF RESIDUE DISPOSAL AT DAWN MINING COMPANY
TAILINGS PILE.

I have reviewed your April 11, 1989 request, which consisted of two basic questions:

1. Can the "filter-cake" residues from mine water treatment operations at the Midnight Uranium Mine be considered byproduct material under section 11e.(2) of the Atomic Energy Act (AEA) of 1954, as amended?

Strictly speaking, the residues are not produced by extraction or concentration of uranium or thorium from ore processed primarily for its source material content. A water treatment process produces such residues primarily with the goal of purifying the water. So the residues do not conform to the definition, and hence do not constitute byproduct material.

2. Is placement of this material into the Dawn Mining Company's uranium mill tailings pile consistent with Federal or State ownership and final transfer to the custody of DOE under §83 of the AEA?

Upon termination of the Dawn Mining Company's operating license, there are two options with regard to transfer of land custody. The first option would be for the Dawn Mining Company to transfer the site to the Federal government for long-term surveillance and care. However, the residues, not being considered byproduct material, may impact this transfer. This consideration should not be taken lightly. NRC and DOE have been struggling over this concern. I enclose a July 1, 1988 letter from the Chairman to Senator Simpson (WY), which states "...DOE has doubts about its authority to take title to the mill tailings disposal sites if NRC has allowed the commingling of NARM (non-byproduct) materials in the impoundments...."

The second option would be for the State of Washington to take title to the site following license termination. Should the State of Washington, as the Agreement State with licensing authority, allow the Dawn Mining Company to dispose of this or other selected processing wastes, it should do so with the acknowledgement that the State will likely have to take title to the site. As noted above, the Federal government might refuse to accept custody of the site following license termination because of the inclusion of these residues into the tailings.

Finally, it should be noted that the analytical information you included in your transmittal indicates that the filter-cake residues may constitute source material, which may be licensable by the State of Washington.

Should you have any questions regarding this memorandum, please contact me or Giorgio Gnugnoli of my staff.



Paul H. Lohaus, Chief
Operations Branch
Division of Low-Level Waste Management
and Decommissioning, NMSS

Enclosure: As stated.



CHAIRMAN

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

July 1, 1988

The Honorable Alan K. Simpson
Subcommittee on Nuclear Regulation
Committee on Environment and Public Works
United States Senate
Washington, D.C. 20510-6175

Dear Senator Simpson:

In your May 13, 1988 letter, you requested information on the status of the American Nuclear Corporation (ANC) amendment request to permit ANC to receive third-party radium-contaminated soils and debris for disposal in its Tailings Pond No. 1.

We have considered this request and the complex regulatory issues involved in authorizing disposal of this type of material at a mill tailings site. We have recently reached the decision that the major regulatory issues noted below would have to be favorably resolved before the U.S. Nuclear Regulatory Commission (NRC) could consider approving the disposal of these radium wastes in ANC's tailings pond under current statutory authority. The statutory authority is unlikely to change in the near future. Therefore, we cannot approve the ANC request. This decision is being conveyed to ANC.

A primary issue stems from the fact that this waste material contains radium and is classified as naturally-occurring and accelerator-produced radioactive materials (NARM). At issue is whether the inclusion of NARM wastes in a mill tailings disposal site is consistent with U.S. Government ownership (or State ownership) and other authorities under Section 83 of the Atomic Energy Act (the Act). Since the U.S. Department of Energy (DOE) is currently designated to take title to the mill tailings sites, NRC requested DOE's view on this question. DOE's response stated that DOE has doubts about its authority to take title to the mill tailings disposal sites if NRC has allowed the commingling of NARM (non-byproduct) materials in the impoundments (a copy of the DOE response is attached).

It is important to note that NRC does not have authority to regulate NARM. Thus, the amendment, if issued, would result in a commingling of regulated and unregulated materials in the same disposal unit. This would create duplicative jurisdiction between NRC and other Federal or State agencies with respect to the commingled radioactive materials. Moreover, if NARM waste constituents were to violate the current standards (e.g., migrate into ground water), the Commission's authority under Section 84c. of the Act to approve alternatives to requirements for disposal or reclamation would be seriously impaired.

PDC

Additionally, the wastes may be subject to presently applicable Resource Conservation and Recovery Act (RCRA) regulations or other U.S. Environmental Protection Agency (EPA) rules for hazardous constituents or NARM, as well as to applicable State requirements. If the waste results from a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) clean-up action, the EPA requirements to be met would also need to be considered by the licensee to ensure that there is no issue regarding suitability of the site for disposal of the CERCLA wastes. The appropriate regulatory authorities would have to address these requirements.

Finally, since there is currently a NARM disposal site licensed by the State of Utah and a license application under review in the State of Colorado, there appears to be no compelling need at this time to dispose of NARM material in uranium mill tailings impoundments.

I hope this information is useful to you and, I appreciate your continued interest in our programs.

Sincerely,

Lando W. Zech Jr.
Lando W. Zech, Jr.

Enclosure:
DOE letter dated June 10, 1988

cc: The Honorable John Breaux
The Honorable John S. Herrington, Secretary
U.S. Department of Energy



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

ENCLOSURE 2

MAR 13 1989

TO: ALL NRC URANIUM RECOVERY LICENSEES

SUBJECT: WHETHER OR NOT URANIUM MILL TAILINGS MATERIAL IS A MIXED WASTE

On October 24, 1988, our office sent you a Federal Register notice issued by the U. S. Environmental Protection Agency (EPA) relative to radioactive mixed waste. Since then, a number of questions have been raised as to the applicability of this notice to uranium mill tailings.

Source, special nuclear, and byproduct material are specifically excluded from regulation under the Resource Conservation and Recovery Act (RCRA). Under Section 11(e)(2) of the Atomic Energy Act, byproduct material is defined to include "the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content." All tailings and wastes included in this definition, such as process fluids and nonradioactive ore residues, are thus byproduct material. Wastes from the decommissioning of buildings and equipment whose primary function was to conduct the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, are considered to be byproduct material. These byproduct material wastes generated by uranium recovery licensees are not mixed wastes and are not subject to EPA regulation under RCRA.

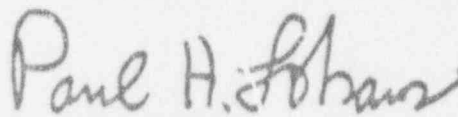
However, byproduct material could become "mixed waste" if it is mixed with hazardous waste. For example, if a licensee had waste that was not byproduct material under the AEA, that was a listed hazardous waste under Subpart D of 40 CFR Part 261, and disposed of this waste by mixing it with Section 11(e)(2) byproduct material (e.g., uranium mill tailings), then the entire mixture would become subject to EPA's RCRA regulations because it contained hazardous waste. In this hypothetical situation uranium mill tailings would indeed be a mixed waste.

Because of the potential regulatory impacts, we suggest that you be certain that you do not introduce any waste into tailings that is a hazardous waste under EPA's RCRA regulations.

In summary: (1) tailings or waste that is byproduct material is not mixed waste, provided it is not mixed with non-AEA material which is hazardous waste; and (2) care should be taken not to mix hazardous waste with tailings material.

If there are questions about this please contact me at (301) 492-0553. You may also wish to contact EPA through their RCRA Hotline, at 1-800-424-9346.

Sincerely,



Paul H. Lohaus, Chief
Operations Branch
Division of Low-Level Waste Management
and Decommissioning, NMSS

cc: R. Dale Smith, NRC/URFO

STAFF ANALYSIS OF DISPOSAL OF NON-BYPRODUCT MATERIAL INTO URANIUM MILL TAILINGS PILES

A. INTRODUCTION

Recently, the NRC received several requests to allow activities other than the normal processing of native uranium ore at licensed uranium milling facilities. These requests have fallen into two categories. The first category of requests is to allow the processing of feedstock material that is not usually thought of as ore, for the extraction of uranium, and then dispose of the resulting wastes and tailings in the facility's tailings pile. The second category of requests is to allow the direct disposal of non-byproduct¹ material, which was not generated onsite, into tailings piles.

In assessing these requests, the staff has raised two concerns related to tailings piles. The first concern is the requested activity might result in complicated, dual, or even multiple regulation of the tailings pile, and the second concern is that the requested activity might jeopardize the ultimate transfer to the United States Government, for perpetual custody and maintenance, of the reclaimed tailings pile.

This analysis addresses the broad issues resulting from proposals requesting regulatory consideration of commingling of tailings with other radioactive wastes and makes recommendations. This paper is limited to options involving commingling with existing tailings impoundments.

B. BACKGROUND

Before 1978, the NRC regulated the activities of the uranium milling process under its authority to regulate source material. The Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978 amended the Atomic Energy Act (AEA) of 1954 to specifically include uranium and thorium mill tailings and other wastes from the process as radioactive material to be licensed by the NRC. Specifically, the definition of byproduct material was revised in Section 11e.(2) of the AEA to include "the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content."

The definition of byproduct material² in Section 11e.(2) of the AEA includes all of the wastes resulting from the milling process, not just the radioactive components. In addition, Title II of UMTRCA amended the AEA to explicitly exclude the requirement for the Environmental Protection Agency (EPA) to

¹For the purposes of this paper, the term "non-byproduct material" will be used to refer to radioactive waste which is similar to byproduct material, as defined in the Atomic Energy Act in Section 11e.(2), but is not legally considered to be 11e.(2) byproduct material.

²Henceforth, byproduct material as defined in Section 11e.(2) of the AEA will be referred to as "11e.(2) byproduct material."

permit byproduct material under the Resource Conservation and Recovery Act (RCRA). The designation of byproduct material contrasts significantly with the situation for source material³ and other radioactive materials controlled under the authority of the AEA. This possibility for dual regulation by both NRC and EPA can become an issue when dealing with mixed hazardous wastes. As a result of UMTRCA, the NRC amended Part 40 of Title 10 of the Federal Code of Regulations (10 CFR), to regulate the uranium and thorium tailings and wastes and the milling processes. Thus, under normal operation, all of the tailings and wastes in an NRC or Agreement State licensed mill producing uranium or thorium are classified as "11e.(2) byproduct material", and are disposed of in tailings piles regulated under 10 CFR Part 40. They are not subject to EPA regulation under RCRA. The EPA Clean Air Act regulations still result in direct EPA permit authority over the mill tailings, whether or not they are commingled with non-byproduct material waste.

The UMTRCA also required and provided for long-term custody and surveillance of the byproduct material and the land used for its disposal. However, the UMTRCA specifically referred only to 11e.(2) byproduct material and did not provide for the transfer of title and custody of other material that may be mixed with it. Thus, although DOE is the Federal agency currently designated as the "custodial agency" by the AEA, it may not have the authority under the AEA to take custody of tailings disposal sites, in which non-byproduct material had been disposed. Even if the material were no more radioactive or toxic than the uranium or thorium tailings themselves, UMTRCA contains no provision allowing for the transfer of custody or title, and hence for eventual long-term custody and surveillance (See Enclosure A).

C. THE TWO CATEGORIES OF REQUESTS FOR COMMINGLED DISPOSAL

The NRC has received a number of proposals to process feedstock materials other than the raw ore received directly from a mine at licensed mills. Some have been approved. These requests assume that, after the extraction of the source material content, the resulting tailings and wastes would meet the definition of 11e.(2) byproduct material and could thus be disposed of in the mill's tailings pile. Such disposals would not be subject to RCRA consideration or call into question DOE's long-term custody authority. No technical problem seems to preclude the addition of this waste material to the tailings after processing, because it would be nearly identical to the mill tailings. In all previous cases and most proposals now under NRC review, the quantities of feedstock material have been small in relation to the quantities of tailings already in the pile.

Some licensees have proposed to directly dispose of radioactive wastes in existing uranium mill tailings sites. The materials vary from tailings from extraction processes for metals and rare-earth metals (such as Copper, Tantalum, Columbium, Zirconium) to spent resins from water treatment

³Except in the case of source material ore, source material consists only of the radioactive components of the waste; i.e., uranium, thorium or any combination of the two [10 CFR Part 40, Section 40.4(h)]. Some source material contains elevated levels of radium, as well, but is not of sufficient concentration of uranium or thorium to be licensed under the AEA.

processes. However, because these materials did not result from the extraction or concentration of uranium or thorium from ore, they are not 11e.(2) byproduct material. These "orphaned" wastes usually have elevated concentrations of source material, and unless otherwise exempted, require licensed control, if the materials exceed the 0.05-percent licensable (content of source material by weight) criterion in 10 CFR Part 40. Disposal of these materials in tailings impoundments would not significantly increase the effect on the public health, safety, and environment. Because of the relatively large volumes of these wastes, low-level waste disposal options are limited. These orphaned wastes are more similar to tailings in volume, radioactivity, and toxicity. Therefore, some waste producers see the mill tailings disposal sites as providing a logical option for such disposal.

The NRC staff provided earlier guidance for addressing these types of requests individually (See Enclosure A). This guidance included cautions regarding the possible problems with dual regulation (RCRA), custody, and title transfer. At present, the NRC will approve of such disposals on their individual merits, and only if the licensee can demonstrate the following:

1. The disposal will have no significant additional effects on the public safety and health, and the environment.
2. The disposal will not compromise the reclamation of the tailings impoundment. In effect, disposal must comply with the reclamation and closure criteria in 10 CFR Part 40, Appendix A.
3. The disposal will not create problems with respect to RCRA or the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).
4. The DOE or the State agrees, in advance, to take title to the site upon completion of the reclamation.

The last two conditions can be significant obstacles to any routine decisions to allow such commingling of byproduct and non-byproduct materials under UMTRCA. Earlier queries to DOE regarding land transfer have not resulted in generic guidance for possible commingling situations (Enclosure B). The NRC staff requested clarification from DOE for five specific types of disposal (Enclosure C). However, the NRC has not received DOE's response.

D. TYPES OF WASTES BEING PROPOSED FOR DISPOSAL INTO TAILINGS PILES

Previously, the NRC had allowed a limited number of such disposals on their individual merits, because the requested disposal could occur without significantly affecting safety or the environment. In the following brief case histories, the NRC approved of processing or disposal of radioactive waste materials, or both, at uranium mill tailings sites:

Example 1. Wastes from Domestic Water Purifying Operations.

In 1987 at the Ambrosia Lake uranium mill in New Mexico, the NRC allowed the Quivira Mining Company (the licensee) to elute uranium from contaminated ion-exchange resins from the Navajo Indian Nation's well water purifying operations in New Mexico and Arizona. The licensee

combined the resultant wastes with other ion-exchange residues from Quivira's operations. The licensee disposed of the combined spent resins in the uranium mill tailings pile.

Although the surface wastes from an in-situ solution mine, including such spent resins, are classified as 11e.(2) byproduct material, the wastes from the Navajo water purification operations would not be considered as such, despite the physical and chemical similarity.

Example 2. Processing Wastes from Other Extraction Operations

The Rio Algom Lisbon uranium mill in Utah has received waste residue from 4 facilities in the last 7 years. These wastes include the following:

- 1) Waste residues from the Mallinckrodt, Incorporated, niobium-tantalum recovery facility in St. Louis, Missouri;
- 2) Waste residues from the Unical-Molycorp yttrium-lanthanides recovery facility in Loviers, Colorado;
- 3) Waste residues from the Allied Chemical Company's Metropolis, Illinois, uranium hexafluoride (UF₆) conversion facility; and
- 4) Waste residues from the Westinghouse Electric Corporation's Bingham Canyon, Utah, uranium secondary recovery ion-exchange facility.

At these facilities, the volume of waste ranged from minimal amounts to less than 1 percent of the annual throughput. The waste materials were radiologically consistent with the existing tailings, and only fluoride was in higher concentration (greater than 1 percent) than the levels typical of the existing tailings. In the first three waste disposals, the Lisbon facility extracted the uranium from the residue. At the UF₆ conversion facility, the uranium concentration in the residue was as high as 0.7 percent.

The residues from the secondary recovery facility (the fourth instance of waste disposal in the list) were buried in a pit excavated in the tailings pond. In this case, a secondary processing operation, licensed by an Agreement State, has been added to the primary circuit. The majority of the waste is returned to the waste circuit of the primary recovery facility. Generally, the NRC or the Agreement States do not license these primary circuits. The Anaconda Copper Mill provides a sidestream to the Bingham Canyon facility. The State licenses the Bingham Canyon facility for the use and possession of source material, but no such AEA-related license is issued to the Anaconda Copper Mill. The waste sidestream is returned to the copper mill following chemical extraction by the Bingham Canyon plant. Waste residues (such as spent resins) from Bingham Canyon are considered source material and must be disposed of as low-level waste. The phosphate fertilizer industry in Florida and Louisiana has a similar situation. In these instances, uranium is extracted in a secondary recovery, and the resulting wastes are combined with primary recovery wastes and disposed of outside of NRC regulatory authority.

In 1987, the NRC authorized the Quivira Mining Company to process residue from the Sequoyah Fuels Corporation's UF₆ conversion plant in Gore,

Oklahoma. The Quivira Ambrosia Lake, New Mexico, Uranium Mill will extract uranium from these residues and dispose of these wastes into the tailings pile. The uranium content of this alternate feed material (0.61 percent) is higher than the average uranium content of ore processed in the United States, but the amount of residue processed to date is less than the total quantity of byproduct material produced during 3 days of full production at the Ambrosia Lake facility.

Example 3. Recovery of Uranium from Mine Water (Mine Water Cleanup)

By amending the source and byproduct material license for particular mines, the NRC has extended the mill circuit and has authorized operation of ion-exchange units at mine sites. Instances of this type of extension include the following:

1. Western Nuclear, Inc.'s Split Rock uranium mill in Jeffrey City, Wyoming, processed residues from the Green Mountain mine ion-exchange water purification operations for the uranium content. The mine water was discharged under a National Pollutant Discharge Elimination System (NPDES) permit, and the combined residues were disposed of in the mill tailings pond.
2. Atlas Minerals Corporation's uranium mill in Moab, Utah, processed ion-exchange residues from the dewatering operations at the Velvet mine. The Velvet mine generated these residues to meet the requirements of an NPDES permit issued by EPA. An NRC license was not issued to the Velvet mine until the pregnant residues were brought to the Atlas mill for processing. The stripped residues were discharged to the mill tailings ponds, and the water was released under an NPDES permit from EPA.
3. Sequoyah Fuels Corporation's (now Rio Algom Corporation) research and development solution mining project in the South Powder River Basin, Wyoming, eluted ion-exchange columns from a nearby, company-owned mine. The residues were discharged to onsite evaporation ponds along with resins from the in-situ operation. The ponds will be eventually cleaned, and the remaining waste will be disposed of at a licensed uranium mill tailings site.

In these cases, the NRC staff interpreted these "alternate feed materials" as being refined or processed ores (See 10 CFR 40.4(k)). The NRC regional counsel had suggested this interpretation of the regulations and the intent of the UMTRCA (See Enclosure D). With this interpretation, the resultant wastes were legitimately classified as 11e.(2) byproduct material.

The NRC and the Agreement States continue to receive requests for the disposal of non-byproduct material into uranium mill tailings piles. The following general categories of non-byproduct material illustrate the requests submitted to the NRC and the Agreement States for disposal into uranium mill tailings piles licensed under authority established by Title II of UMTRCA:

1. Mine Wastes

To mine uranium or other source material ore from underground or open pit

mines, operators frequently need to dewater the mine cavities. This results in quantities of mine water with suspended or dissolved constituents, some of which are source material. After processing the mine water to satisfy NPDES or other release requirements, the resultant clean mine water is then discharged offsite. In some cases, the resulting water treatment sludge residues exceed the 0.05-percent licensable limit for source material, but do not satisfy the definition of 11e.(2) byproduct material, because they do not result primarily from the extraction for the source material content.

The NRC and Agreement States have been contacted by licensees and waste generators that desire to dispose of such sludge residue directly into the tailings piles at licensed uranium mill tailings sites. The NRC has indicated that such material does not constitute 11e.(2) byproduct material (See Enclosure E).

Requestors have also proposed processing the mine waste material through the uranium mill's circuit to remove the uranium product, before disposal into the tailings pile. In the past, the NRC has modified licenses to allow alternate feed materials to be processed individually (See previous examples). If the material can be classified as an ore and is processed for its source material content, the resultant waste is 11e.(2) byproduct material.

2. Secondary Process Wastes

Frequently, natural ores that are processed for rare-earth or other metals have significant concentrations of radioactive elements. Examples include copper, zirconium, and vanadium ores. The NRC has received requests from NRC and Agreement-State licensees to dispose of tailings, resulting from processes to extract other metals, into licensed uranium mill tailings piles.

Disposal of such wastes at licensed uranium or thorium mills, may pose some difficulties for the eventual title transfer under Section 83 of the AEA. The Nuclear Waste Policy Act (NWPA) of 1982, Sections 151(b) and (c), provide some options for Federal custody of these commingled wastes. However, the NWPA does not provide for a post-closure licensing supervision, as does the AEA. If the NRC were to routinely consider the direct disposal of such non-byproduct material at uranium mills, the NRC should request statutory modification of the AEA, Section 83, to allow such disposal to be treated as if the non-byproduct materials were AEA wastes under Section 83. Such a modification would resolve the ownership and the RCRA considerations.

3. Formerly Utilized Sites Remedial Action Program (FUSRAP)

These sites primarily processed materials, such as monazite sands, to extract thorium for commercial applications. The Government contracts were issued for thorium source material used in the Manhattan Engineering District and early AEC programs. Some of the sites are disposal areas of waste materials that qualify as 11e.(2) byproduct material. The company owning one such site, the Stepan Chemical, Co., Maywood, New Jersey has an NRC license. The U.S. Department of Energy (DOE), which accepts

responsibility for the FUSRAP materials, is investigating options for disposal and control of these materials. DOE estimates that a total of 1.7 million cubic yards of material is located at sites in 13 states. Recent proposals have considered the transportation of FUSRAP materials from New Jersey to tailings piles at uranium mills in other states, such as Utah, Washington, and Wyoming.

4. Naturally-occurring and Accelerator-produced Radioactive Material (NARM)

These wastes result from a wide range of operations, but are not generally regulated by the AEA. Past requests for disposal in uranium mill tailings ponds have included contaminated resins from ion-exchange well water purifying operations. The NRC has also received inquiries regarding the disposal of construction scrap and radium-contaminated soil from old commercial operations. As mentioned previously, the NRC has approved a limited number of such disposals and considers the merits of each request individually. The individual states usually administer the regulatory responsibility over NARM, but many other Federal agencies have jurisdiction responsibilities related to NARM. These include the Environmental Protection Agency (EPA), the Consumer Product Safety Commission, the Department of Health and Human Services, and the Department of Labor. There is a state-licensed NARM disposal facility in Clive, Utah, licensed to Envirocare of Utah, Inc.

E. MAJOR ITEMS TO BE ADDRESSED

Although the technical, economical and societal advantages in some proposals have appeared to encourage such disposal of radioactive material into tailings piles, significant statutory and regulatory issues may complicate such disposal:

1. Custody and Title Transfer

UMTRCA, Title II, Section 202, (Section 83 of the AEA) stipulates that such title to the 11e.(2) byproduct material and to the land used for the disposal of 11e.(2) byproduct material shall be transferred to either the United States Government or to the State in which the land is located. UMTRCA identifies the DOE, or any other agency so designated by the President, to be the custodial agency for the U.S. Government. However, at its option, the State may elect to become the custodial licensee of the site following closure.

Past correspondence from DOE (Enclosure B) indicates DOE's uncertainty regarding its authority to accept custodial transfer of tailings sites, where radioactive material, not constituting 11e.(2) byproduct material, has been commingled. In a letter of October 5, 1989, (Enclosure C), the NRC staff requested more specificity from DOE. However, DOE has not yet responded.

The NRC has two concerns relating to this transfer:

- a. The licensee for any site where the materials would be commingled would need strong assurances or permission from either the State or DOE that the commingling would not compromise the eventual transfer of title and custody.

- b. The license cannot be legally terminated, unless the custody and title has been transferred as stipulated in Section 83 b(1)(A) of the AEA. Commingling of wastes could complicate this transfer and, hence, the termination of the license.

As mentioned previously, Sections 151(b) and (c) of the NHPA help resolve this issue, provided the NRC makes certain statutory findings. These provisions address DOE taking custody of low-level waste disposal sites. Section 151(c) specifically addresses sites where wastes resulting from extraction of rare earths, zirconium and hafnium from source material are disposed. Furthermore, the Commission can require the licensee to make available financial arrangements for long-term care under Section 151 a.(2), although the DOE or the State are not identified as the long-term (perpetual) care licensees, as specified in AEA, Section 83 b.(5).

2. RCRA Authority and Mixed Waste

The NRC and Agreement-State licensed uranium and thorium milling facilities do not fall under the jurisdiction of RCRA. However, radioactive wastes (such as NARM), which are not source or byproduct material, are not exempted from RCRA. Commingling RCRA-regulated wastes with tailings could result in the application of the EPA RCRA regulations and separate EPA permitting authority. The licensee would have to comply with both EPA and AEA-related regulations.

The NRC has revised the regulations in 10 CFR Part 40 (including Appendix A) to conform to the appropriate portions of EPA's RCRA regulations. The UMTRCA, as amended, stipulates that regulations for byproduct material be consistent with the Solid Waste Disposal Act (SWDA). On November 13, 1987, the NRC conformed the regulations of 10 CFR Part 40 to the RCRA provisions of the SWDA. With that revision, the AEA explicitly excludes byproduct material from RCRA. However, if a licensee disposes of source material compounds or mixtures, other than uranium or thorium ores, in the tailings piles, only the source material component of that compound or mixture would be excluded from the provisions of RCRA, if the compound or mixture qualifies as "hazardous".

Commingled material that does not contain hazardous waste could be categorized as solid waste and be disposed of in a landfill under the provisions of 40 CFR Part 241 "Guidance for the Land Disposal of Solid Waste."

3. Decision Whether or Not to Process Material Prior to Disposal in the Tailings

In some cases, licensees have inquired whether the processing of radioactive waste as a feed material, before disposal into the tailings, would compromise the status of the resultant waste stream as 11e.(2) byproduct material. In those instances where NRC has allowed such processing, the radioactive waste feed material was considered to be "refined and/or processed ore." However, the radioactive waste feedstock itself was not considered to be 11e.(2) byproduct material. In addition, the wastes, such as those resulting from uranium mining water cleanup, may also be subject to regulatory control by other entities under authorities distinct from the AEA, such as EPA under RCRA. The source

material content of the radioactive waste could be extracted so that the residual waste conformed to the definition of 11e.(2) byproduct material. In the past, cases of this type of processing included the processing of slurry waste from Sequoyah Fuels UF₆ Plant in Gore, Oklahoma, at the Quivira Uranium Milling Facility in Ambrosia Lake, New Mexico. (See Section D.)

Other licensees have requested to dispose of the waste material directly into the tailings pile without processing. This disposal has been justified because the material is similar in chemical, physical and material content to the tailings. Therefore, adding the waste to the tailings should not affect reclamation or significantly alter the effect to the environment.

However, should the uranium mill operator accept source material waste from other persons for direct disposal without extracting the source material content, the mill operator may need to satisfy requirements specified in 10 CFR Part 61 or equivalent sections of the State regulations that limit the quantities and concentrations of 11e.(2) byproduct material disposal. Part 61 of 10 CFR governs the commercial disposal of low-level radioactive waste, and the licensee would need to perform a case-specific analysis and justification to maintain licensed status under both Parts 40 and 61 of 10 CFR.

F. DISCUSSION OF DISPOSAL WITHOUT PREVIOUS PROCESSING

The NRC has only two options in its decision with respect to the direct disposal of non-byproduct material into uranium or thorium mill tailings piles. One option is to prohibit entirely any disposal of radioactive material that is not 11e.(2) byproduct material. That position is based on a very strict reading of the AEA, which allows no flexibility to commingle.

The other choice is to allow some commingling of non-byproduct material with uranium or thorium mill tailings under criteria that satisfy current regulatory constraints and guidance (See Enclosure A). If a licensee does request approval under the current regulations, NRC could authorize routine disposals in uranium or thorium mill tailings piles with some limiting criteria. These criteria would include the following:

1. The disposal will cause no significant additional effects to the public safety, health and the environment.
2. The disposal will not compromise the reclamation of the tailings impoundment. This criterion implies compliance with the reclamation and closure criteria stated in 10 CFR Part 40, Appendix A.
3. The disposal will cause no problems in meeting the requirements of the RCRA or CERCLA.⁴

⁴In effect, this would only allow source material, which is not mixed waste. Categories excluded would be mixed waste source material, mixed waste NARM and NARM which is not mixed waste.

4. The DOE or the State agrees, in advance, to take title to the site upon completion of the reclamation.

The licensee would need to obtain the necessary assurance from DOE with respect to Guideline 4, before requesting any such license amendments from the NRC to allow disposal of non-byproduct material in the tailings pile. Previously, the NRC staff had also identified other factors that the generator or licensee, or both, should consider in their evaluation of disposal alternatives. These factors include the following:

- o The volume of non-byproduct waste does not exceed the volume of 11e.(2) byproduct material.
- o Other commercial disposal alternatives have been evaluated.
- o There is sound justification for the commingling for furthering the national program for the safe disposal of all radioactive wastes.

Numerous uranium mill tailings piles have sufficient capacity to be disposal sites for similar non-byproduct waste material. Under most conditions, the NRC staff does not have significant health, safety, or environmental concerns associated with commingling.

Presently, the NRC considers any request to dispose of non-byproduct material at a uranium mill on its merits alone. The licensee and owner of the tailings pile are responsible to justify any request for commingling. The licensee must obtain the necessary approvals from EPA with respect to any hazardous waste and the legal views from the State or DOE, with regard to site custody and title transfer. The process of obtaining such approvals and the possible legal complications may prevent uranium recovery licensees from considering direct disposal without previous processing.

The choices for resolving regulatory or licensing issues include the following:

1. Continue with the present policy.
2. Negotiate a memorandum of understanding (MOU) between interested parties.
3. Issue policy directives or orders.
4. Initiate a rulemaking to address the issue.
5. Request for legislative change.

Because the fundamental problem with direct disposal results directly from the legislation (Section 83 b(1)(A) of the AEA), options 2, 3, and 4 will only provide limited relief. Furthermore, options 2 and 3 do not have the legal standing of a regulation or a law. The NRC staff continues to consider proposals for the direct disposal into uranium mill tailings piles on their individual merits under the aforementioned criteria. However, the NRC staff expects that licensees will continue to submit such commingling requests. Therefore, the NRC should seek a final solution. Such a solution would probably involve a combination of alternatives 1, 4 and 5. Until the law is

changed and the ensuing rule could be promulgated, the NRC would still continue with the present policy to consider requests on their individual merits.

In this paper the staff is presenting only the options involving commingling with existing tailings impoundments. However, the staff recognizes the existence of numerous other alternatives including the following:

- o Locate a disposal site adjacent to, but not contiguous with, the tailings impoundment. This option may require obtaining a license or permit from the NRC, EPA, or the State if the non-byproduct material constitutes source material. In that case, the licensee would need to obtain a 10 CFR Part 61 license.
- o NRC or Agreement-State uranium or thorium milling licensees may consider direct commingling with certain low-level radioactive wastes by applying for a commercial waste disposal license under 10 CFR Part 61, in addition to the 10 CFR Part 40, or Agreement-State equivalent regulations. This alternative would require a distinct analysis of the commingling scheme, because of the routine prohibition in 10 CFR Part 61 regarding the disposal of significant quantities and concentrations of 11e.(2) byproduct material.
- o Apply for a permit from a State to dispose of naturally-occurring and accelerator-produced radioactive material (NARM).
- o If the radioactive waste is not classified as hazardous and if it can be defined as a solid waste, then it can be disposed of in a landfill under the provisions of 40 CFR Part 241, "Guidance for the Land Disposal of Solid Waste."

These options are all available to the owner and generator of such waste without significant Commission policy or regulatory modification. Therefore, this paper does not address these options. However, the applicant for a commingling disposal should consider these other options and determine that they offer no reasonable solution.

G. RESULTS OF THE NRC STAFF ANALYSIS

The NRC staff identified the following solutions to requests for direct disposal:

1. Treat proposals on their individual merits, subject to criteria outlined in the previous section (Also Enclosure A).

The NRC is using this alternative to evaluate commingling proposals involving non-byproduct material at NRC-licensed uranium and thorium mills. However, the NRC could simplify the process for complying with those criteria by acting to facilitate commingling of byproduct and non-byproduct material wastes. Federal action to clarify the regulatory framework could include NRC negotiating a memorandum of understanding (MOU), or separate MOUs, with EPA, DOE and the State(s), which would specify explicit conditions under which such commingling at uranium mill tailings sites would be acceptable.

2. Request statutory authority to allow commingling at the Commission's discretion without compromising a tailings site's custody or title transferability or introducing multiple overlapping EPA regulatory authority.

This alternative would clarify Congress' intent in UMTRCA and should provide a uniform national policy to limit the number of low-radioactivity disposal sites. This legislative change may require changes in NRC and EPA regulations. The NRC rulemaking would implement the legislative change to provide generic discretion to the Commission for such commingling applications. By modifying 10 CFR 150.15(a) to provide uniformity and consistency in such commingling decisions, the Commission could expressly reserve such discretion to itself. Because this process can require a significant amount of time, the NRC would still proceed with item 1 mentioned herein.

For processing alternative feedstocks for uranium and thorium mills, the staff concluded that a definition of ore, with the AEA's definition of byproduct material, would resolve the uncertainty in the present regulations. The NRC would initiate a rulemaking to establish in 10 CFR Part 40, a definition of ore with the definition of byproduct material as follows:

For the purposes of this definition (of byproduct material) "ore" means a natural or native matter that may be mined and treated for the extraction of any of its constituents or any other matter from which source material is extracted in a uranium or thorium mill.

STAFF COMMENTS

FOIA 93-225

The documents and/or explanation will be listed as they appear in Mr. Darke's request.

Item No. 1
06/04/90

NRC Note to RBangart, et. al., from PLOhaus re: draft SECY paper on disposal of non-byproduct material in uranium mill tailings piles. (This is the "non-byproduct Commingling SECY Paper" referred to in 5/24/90 meeting summary; this is a predecessor to the 7/17/90 version in Item 2 below. (53 Pages)

Item No. 2
07/17/90

This is the entire computer file of staff analysis. We do not have a draft of the Commission paper with the same date. (12 Pages)

Item No. 3

Darke requested a meeting summary of a 5/15/90 meeting. We do not have a copy nor do we know if one exists. The confusion on this one is that the memo that he attached to his request (page 6 of 7) tells of a meeting on May 23, 1990 in the Subject line and then says in the first line of text, "As a follow-up to our meeting on May 15, 1993...." LLWM is not sure which date of the meeting is correct.

Item No. 4

Darke requested a draft combined Commission Paper. This is the same paper identified in Items 1 and 2 above.

A/B