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Standard Review Plan for Conventional Uranium Mill Heap Leach Facilities

Comment On: NRC-2014-0178-0005

Standard Review Plan for Conventional Uranium Mills and Heap Leach Facilities; Reopening of Public Comment Period

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Comment on FR Doc # 2015-08797

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General Comment

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12

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Comments on the Draft Report for Comment: Standard Review Plan for Conventional Uranium Mill and Heap Leach Facilities

Docket ID: [NRC-2014-0178]

Attachments

Kennecott_comments_StandardReviewPlan

SUNSI Review Complete

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18 June 2015

Cindy Bladey,
Chief, Rules, Announcements, and Directives Branch (RADB)
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U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

**Subject: Kennecott Uranium Company Comments on the Draft Report for
Comment: Standard Review Plan for Conventional Uranium Mill and Heap
Leach Facilities Docket ID: [NRC-2014-0178] – (Federal Register Volume
79, Number 243 / Thursday, December 18, 2014 / Notices)**

Dear Ms. Bladey:

Kennecott Uranium Company is a uranium recovery licensee that is the owner and operator of the Sweetwater Uranium Project located in the Great Divide Basin in Sweetwater County, Wyoming. The Sweetwater Uranium Project contains one of the remaining three (3) conventional uranium mills in the United States.

The three (3) remaining conventional uranium mills (along with their locations, ownership information and images) in the United States are as follows:




		
White Mesa Uranium Mill	Shootaring Canyon Uranium Mill	Sweetwater Mill
Near Blanding, Utah	Near Tickaboo, Utah	Near Rawlins, Wyoming
Energy Fuels Resources (USA) Inc.	Uranium One Americas, Inc.	Kennecott Uranium Company

Image Source: Google Earth
(Top of image is North)

A fourth conventional uranium mill that has been permitted but not constructed is the Pinon Ridge Mill permitted by Energy Fuels Resources (USA) Inc., located between Naturita and Paradox, Colorado in Montrose County, Colorado.

There are no extant uranium heap leach facilities in the United States; however the following facilities have operated in the past:

- East Gas Hills (UMETCO) - Gas Hills, Wyoming
- Durita (Hecla Mining) - Colorado
- Day Loma - Gas Hills, Wyoming
- Maybell - UMETCO - Colorado
- Ambrosia Lake - Ambrosia Lake, New Mexico

At least one operator is considering a uranium heap leach facility in the future.

The following are Kennecott Uranium Company's comments on the *Draft Report for Comment: Standard Review Plan for Conventional Uranium Mill and Heap Leach Facilities (Plan)*:

Executive Summary/Definition of Uranium Recovery (Processing)

The Executive Summary of the document states:

Uranium recovery is any activity that produces byproduct material, which is defined 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." Most byproduct material from conventional uranium mills and heap leach facilities is mill tailings. Other wastes, such as contaminated equipment, are also byproduct material. NRC does not regulate the mining of uranium. (page xi)

Over time however, questions have arisen regarding whether or not a particular activity is an "...activity that produces byproduct material", which is defined 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*" and as such a clear definition and discussion of the extents of the agency's authority under the Atomic Energy Act of 1954 as amended should be included in this document. In other words this document should clearly define and discuss which activities do and do not require a license under the Atomic Energy Act of 1954 as amended and thus constitute processing.

The document uses a circular definition of processing in that it defines uranium recovery as "...any activity that produces byproduct material..." while 11 (e).2 byproduct is defined in part 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. The document defines processing (uranium recovery) as any activity that produces byproduct material while byproduct material is defined as material produced by processing (uranium recovery). In addition, the activity (processing) is defined in terms of the waste it produces and not in terms of the product it creates.

The question of what constitutes processing and where processing begins in uranium extraction activities is not clearly defined. When uranium ore is mined in either an underground or open pit mine the act of mining can serve to high grade the uranium ore. For example, in an underground mine, the miners can drill, blast and remove the high grade material in the mine face first and then drill, blast and remove the

lower grade material. This step known as "*spilt shooting*" effectively yields a higher grade product. This can be done as well in open pit mining by selectively excavating higher grade material from each given level in the open pit and removing it separately. Uranium can also be selectively high graded during mining by checking each ore truck as it leaves the underground workings or the open pit (assuming that the ore is in radiometric equilibrium a simple check by a scintillometer or Geiger counter of each truck would suffice) and directing the trucks to deposit material in different piles depending upon the magnitude of the gamma reading. This would place higher grade uranium product in the higher grade ore piles. These described methods are relatively crude. A commercial separator could be used to radiometrically sort the ore. Assuming it was in radiometric equilibrium, this device would essentially high grade the ore. Any sorting or beneficiation does not generate "waste", but generates overburden or waste or *gangue* (the commercially valueless material associated with the ore minerals) which does not require any special handling or processing such a device is known as an ore sorter. An overview discussion of ore sorting technology may be found at:

<http://technology.infomine.com/reviews/oresorting/welcome.asp?view=full#Problems>

An online article (<http://www.world-nuclear.org/info/Country-Profiles/Countries-A-F/Appendices/Australia-s-Uranium-Mines/>) on the Energy Resources Australia (ERA) Ranger Mine discusses an ore sorter stating:

A new \$19 million radiometric ore sorter was commissioned at the same time, to upgrade low-grade ore and bring it to sufficient head grade to go through the mill. It will add about 1100 tonnes U₃O₈ to production over the life of the mine, and be essential for beneficiating carbonate ore from the lower mines sequence of the Ranger 3 Deeps.

This question regarding what constitutes processing (which requires a license) was recently raised regarding a technology called ablation. This technology was discussed in a public meeting on December 19, 2013. At issue was whether the process would require a source material license. In an enclosure to a letter dated March 20, 2013 from Duncan White, Chief, Agreement States Program Branch (ADAMS Accession Number ML13345A266) the agency states:

After review of the ablation process, it appears that the proposed surface ablation processing is an ore grinding or refining process that is subject to source material licensing under 10 CFR Part 40 (or Agreement State equivalent regulations). A source material license is required because the ablation process physically changes the ore.

Historically, the NRC has required source material licenses for ore buying, ore sorting, and mine water ion exchange (IX) (for uranium) facilities and has not treated them as uranium milling facilities. The first two types of facilities would have ore crushers and sometimes ore sorters which separated the ores after crushing to sizes approximately 2 inches or less into separate ore piles based on the uranium concentration. The third type (IX facilities) is considered as a secondary recovery facility and the source material loaded on the IX is the licensed material, not the mine water.

As stated above, the ablation process would, at a minimum, be required to have a source material license. The NRC is also evaluating whether the application of this process to uranium recovery should be licensed as uranium milling.

In a letter dated December 12, 2013 (ADAMS Accession Number ML13227A070) the agency states:

As previously communicated to Ablation Technologies, it appears that the ablation process would, at a minimum, require a source material license.

In the minutes of the December 19, 2013 public meeting (ADAMS Accession Number ML14017A104) the following two (2) agency comments are cited

Comment: NRC staff briefly discussed its late 1970's guidance document on uranium ore buying stations (note this guidance is available in ADAMS under accession number ML13358A075). NRC staff stated that this guidance should be considered in development of the white paper.

Comment: NRC staff recognizes that ablation of uranium ore wasn't considered during development of the 1980 Final Generic Environmental Impact Statement on uranium milling (NUREG-0706). NRC staff stated it may need more detailed technical information on the ablation technology to be able to make an informed decision. This should be considered in development of the white paper.

The February 3, 1978 Branch Position for the Contents of Applications for Uranium Ore-Buying Station Licenses states:

In order to process or refine ores containing by weight 0.05% or more of uranium, after removal from their place of deposit in nature, a USNRC Source Material License is required.

This language and the Commission's authority to regulate source material are derived from Section 65 (Reporting) of the Atomic Energy Act of 1954 as amended which states:

Sec. 65. Reporting

The Commission is authorized to issue such rules, regulations, or orders requiring reports of ownership, possession, extraction, refining, shipment, or other handling of source material as it may deem necessary, except that such reports shall not be required with respect to (a) any source material prior to removal from its place of deposit in nature, or (b) quantities of source material which in the opinion of the Commission are unimportant or the reporting of which will discourage independent prospecting for new deposits.

RIS 00-023: Recent Changes to Uranium Recovery Policy dated November 30, 2000 discusses the processing of materials other than natural ores and includes a section entitled *Interim Position and Guidance on the Use of Uranium Mill Feed Material Other Than Natural Ores* that contains the following definition:

Ore is 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 licensed uranium or thorium mill.

This definition defines *ore* in terms of what is produced from it namely *source material* and where such extraction occurs namely *in a licensed uranium or thorium mill*.

The Plan needs to adequately define processing and should do so in a similar manner to the above cited definition in which processing would be defined in terms of what is produced and is consistent with the above cited definition. Suggested language could be:

Processing is the extraction of source material from a mined natural or native matter (ore) or any other matter in a licensed uranium or thorium mill with such processing yielding one or more compounds that are source material.

This definition would confine processing to that which occurs in licensed uranium and thorium mills to mined natural or native matter (ore) or any other matter. This definition would relegate any other activities to a class of activities other than processing, specifically beneficiation which is defined as follows:

"... one of a variety of processes that take extract ore from mining and separate it into the desirable mineral and gangue, the part of the ore that is unusable."

Source: <http://en.wikipedia.org/wiki/Beneficiation>

The above definition of processing limits it to the "...extraction of source material..." This definition is dated November 30, 2000 and should supersede any discussion of processing in *Health Physics Position-184* that is based upon events related to an inspection and subsequent discussion of them in 1977.

With the advancement of technology for mining and the development of new techniques for removing ore from its place in nature in a more cost-effective and efficient manner, Staff must be mindful of the reasons for exerting jurisdiction over given activities and must not hastily apply interpretations of the past where such applications do not fit currently proposed site-specific scenarios.

Licensees and applicants need unambiguous guidance as to what does and does not constitute processing and when and under what circumstances a license is required. This information should be at the beginning of the document and included in the form of a decision tree or flow chart.

The Executive Summary of the document should at the least reference the following items regarding whether an activity requires a license:

- February 3, 1978 *Branch Position for the Contents of Applications for Uranium Ore-Buying Station Licenses* ADAMS Accession Number ML13358A075
- March 20, 2013 letter from Duncan White, Chief, Agreement States Program Branch regarding ablation technology (ADAMS Accession Number ML13345A266)
- December 12, 2013 letter regarding the ablation technology (ADAMS Accession Number ML13227A070)
- December 19, 2013 public meeting minutes (ADAMS Accession Number ML14017A104)
- FOLLOW UP RELATED TO DECEMBER 19, 2013, PUBLIC MEETING ON USE OF THE ABLATION TECHNOLOGY ON URANIUM ORE (ADAMS Accession Number ML14086A497)

The Executive Summary also states:

Uranium ore removed from a mine and transported directly to a conventional mill or heap leach facility would be subject to NRC jurisdiction when it crosses the license boundary. This is consistent with 10 CFR Part 40, Appendix A, Criterion 5H, which requires that steps be taken to minimize penetration of radionuclides into underlying soils at uranium ore stockpile locations.

10 CFR Part 40 Appendix A Criterion 5H states:

5H—Steps must be taken during stockpiling of ore to minimize penetration of radionuclides into underlying soils; suitable methods include lining and/or compaction of ore storage areas.

10 CFR § 40.13 Unimportant quantities of source material (Section b) states:

(b) Any person is exempt from the regulations in this part and from the requirements for a license set forth in section 62 of the act to the extent that such person receives, possesses, uses, or transfers unrefined and unprocessed ore containing source material; provided, that, except as authorized in a specific license, such person shall not refine or process such ore.

The statement in the draft *Standard Review Plan* appears to conflict with 10 CFR § 40.13 (b) unless the reader is familiar with Section 205.1 of UMTRCA and *NUREG-0706 - Final Generic Environmental Impact Statement on Uranium Milling - Volume II* (September 1980) which states:

Section 205.(a) of the UMTRCA amends the Atomic Energy Act of 1954 by adding a new Section 84 which states in part that "the Commission shall insure that the management of any byproduct material, as defined in section 11e.(2), is carried out in such manner as the Commission deems appropriate to protect the public health and safety and the environment from radiological and nonradiological hazards associated with the processing and with the possession and transfer of such material..." [emphasis added]. The storage of ore on an ore pad prior to milling clearly constitutes an activity associated with processing. Under the language of new Section 84, therefore, it is within NRC's authority to regulate ore pad activities.

The document should also include the above cited language from *NUREG-0706 - Final Generic Environmental Impact Statement on Uranium Milling - Volume II* (September 1980) for clarity.

Proposed activities

The document requests information on ore body locations and estimated uranium content stating:

Ore-body locations and estimated uranium content [Note: The U.S. Nuclear Regulatory Commission (NRC) regulates milling operations, not mining operations. The U.S. Department of Interior Office of Surface Mining, the U.S. Department of Labor Mine Safety and Health Administration, and the individual states regulate mining operations. The information on ore body location and estimated uranium content is for understanding milling operations.]

It should be noted that the Office of Surface Mining (OSM) limits its activities solely to coal and that the Bureau of Land Management (BLM) regulates mining on Federal lands that they manage and the U.S. Forest Service (USFS) regulates mining on Federal lands that they manage. The Nuclear Regulatory Commission (NRC) and the Bureau of Land Management (BLM) entered into a Memorandum of Understanding (MOU) dated November 30, 2009 regarding development of uranium or thorium resources on public lands, including Federal mineral estates, under the administration of the Bureau of Land Management (BLM).

Unrefined and unprocessed ore is exempt from regulation under 10 CFR Part 40 as long as such material is not refined or processed. Ore at a mine site is by definition unrefined and unprocessed therefore exempt from the regulations in 10 CFR Part 40 and from the requirement for licensing and as such no

information regarding it should be requested in this document. In addition a potential conventional mill or heap leach licensee may be unable to provide such information because:

- Their operation will be a toll milling or toll leaching operation in which they will accept ores from other operators who may be unwilling or unable to provide information on their resources.
- The applicant itself may be unable to provide such information because they have not completed their delineation work at the time the license application is submitted.
- In addition, resource information may well be confidential business information.

Rather than requesting specific descriptions of the ore body, the source of the ore to be processed which could change over time as some mines close and other open, it may be best to just request basic operating parameters for the mill that would include a basic window of materials that it is being designed to accept.

Site Characterization - Site Location and Layout

This section requests information on:

Locations of abandoned, properly or improperly plugged wells, borings, exploratory holes, and mine shafts. The applicant has properly assessed whether or not these previous features are properly plugged and provide information on methods of assessment. The staff should review information on the depth of these abandoned or plugged features at and near the proposed site. If detailed information on locations of water supply and monitoring wells is not available at the time of the initial facility application, expected well locations are provided with an indication that the information is preliminary.

Uraniferous areas likely to host a licensed conventional mill or heap leach facility in the United States are likely to have been extensively drilled beginning in the 1950s. Applicants may be unable to provide information regarding properly or improperly plugged wells, borings or exploratory holes. A prudent operator will attempt to address abandoned, and/or properly or improperly plugged wells borings, exploratory holes and mine shafts beneath any proposed construction (construction of mills, tailings impoundments, fluid retention impoundments and heap leach pads) however such efforts should be limited in lateral extent because of the construction requirements of conventional uranium mills, ore pads, heap leach piles and tailings impoundments are very rigorous and there should be no need to be concerned about properly or improperly plugged wells, borings or exploratory holes beyond the immediate area of construction for the following reasons:

- Tailings impoundments must be constructed in accordance with 40 CFR Part 61 Subpart W which requires that:

All mill owners or operators shall comply with the provisions of 40 CFR 192.32(a) in the operation of tailings piles, the exemption for existing piles in 40 CFR 192.32(a) notwithstanding.

This requirement forces applicants to meet the following requirement:

(1) Surface impoundments (except for an existing portion) subject to this subpart must be designed, constructed, and installed in such manner as to conform to the requirements of

§ 264.221 of this chapter, except that at sites where the annual precipitation falling on the impoundment and any drainage area contributing surface runoff to the impoundment is less than the annual evaporation from the impoundment, the requirements of § 64.228(a)(2) (iii)(E) referenced in § 264.221 do not apply.

40 CFR Part 221 (c)(1)(i) states:

(i) The liner system must include:

(A) A top liner designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into such liner during the active life and post-closure care period; and

(B) A composite bottom liner, consisting of at least two components. The upper component must be designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into this component during the active life and post-closure care period. The lower component must be designed and constructed of materials to minimize the migration of hazardous constituents if a breach in the upper component were to occur. The lower component must be constructed of at least 3 feet (91 cm) of compacted soil material with a hydraulic conductivity of no more than 1×10^{-7} cm/sec.

Given that there is a double liner requirement, the presence of properly or improperly plugged wells, borings or exploratory holes should not be of concern.

- Evaporation ponds which are surface impoundments must currently at a minimum be constructed in accordance with 40 CFR part 40 Appendix A Criterion 5A(1) that states:

5A(1)—The primary ground-water protection standard is a design standard for surface impoundments used to manage uranium and thorium byproduct material. Unless exempted under paragraph 5A(3) of this criterion, surface impoundments (except for an existing portion) must have a liner that is designed, constructed, and installed to prevent any migration of wastes out of the impoundment to the adjacent subsurface soil, ground water, or surface water at any time during the active life (including the closure period) of the impoundment. The liner may be constructed of materials that may allow wastes to migrate into the liner (but not into the adjacent subsurface soil, ground water, or surface water) during the active life of the facility, provided that impoundment closure includes removal or decontamination of all waste residues, contaminated containment system components (liners, etc.), contaminated subsoil's, and structures and equipment contaminated with waste and leachate. For impoundments that will be closed with the liner material left in place, the liner must be constructed of materials that can prevent wastes from migrating into the liner during the active life of the facility.

Again, given this standard there should be no concern regarding presence of properly or improperly plugged wells, borings or exploratory holes.

The proposed rulemaking on 40 CFR Part 61 Subpart W (Federal Register /Volume 79, Number 85 / Friday, May 2, 2014 / Proposed Rules) if made final as proposed, would require that these evaporation ponds, called Non-Conventional Impoundments in the proposed rule which defines them as:

A non-conventional impoundment can be located at any uranium recovery facility and contains uranium byproduct material suspended in and/or covered by liquids. These structures are commonly known as holding ponds or evaporation ponds. They are removed at facility closure.

Be double-lined like tailings impoundments when it states:

(b) Non-Conventional Impoundments. Non-conventional impoundments shall meet the requirements of 40 CFR 192.32(a)(1). During operation and until final closure begins, the liquid level in the impoundment shall not be less than one meter.

This is a stringent requirement that would eliminate any concern about the potential for unplugged boreholes.

- *Heap leach pads are also surface impoundments used to manage uranium and thorium byproduct material and must at a minimum be constructed in accordance with 40 CFR part 40 Appendix A Criterion 5A(1) as listed above. Again, given this standard there should be no concern regarding presence of properly or improperly plugged wells, borings or exploratory holes.*

The proposed rulemaking on 40 CFR Part 61 Subpart W (Federal Register /Volume 79, Number 85 / Friday, May 2, 2014 / Proposed Rules) if made final as proposed, would require that these pads be double lined like tailings impoundments when it states:

(c) Heap Leach Piles. Heap leach piles shall comply with the phased disposal management practice in 40 CFR 61.252(a)(1)(i). Heap leach piles shall be constructed in lined impoundments that are no more than 40 acres in area and shall comply with the requirements of 40 CFR 192.32(a)(1).

This is a stringent requirement that would eliminate any concern about the potential for unplugged boreholes.

- *Mill and processing facilities are constructed on concrete slabs with sumps that preclude the escape of fluids. Given this fact there should be no concern regarding presence of properly or improperly plugged wells, borings or exploratory holes. This protection is discussed in the draft standard review plan in Section 3.4.3(3) when it states:*

The processing building has been designed to contain the volume of the largest tank without a release to the environment.

- *Ore stockpiles are regulated under 40 CFR Part 40 Appendix A Criterion 5(H) which states:*

5H—Steps must be taken during stockpiling of ore to minimize penetration of radionuclides into underlying soils; suitable methods include lining and/or compaction of ore storage areas.

Prevention of seepage from ore stockpiles should eliminate the need for addressing properly or improperly plugged wells, borings or exploratory holes.

Conventional or heap leach milling facilities are designed to be zero-discharge facilities, unlike in-situ recovery facilities that conduct extraction in a subsurface aquifer at which improperly plugged boreholes could be a concern.

Current and proposed seepage control measures should eliminate the need for large scale searches for and plugging of legacy boreholes.

Site Characterization - Meteorology

The document states:

"The minimum amount of meteorological data needed for a siting evaluation is considered to be that amount of data gathered on a continuous basis for a consecutive 12-month period that is representative of long-term weather patterns..."

Weather is very variable. How is the licensee supposed to determine that a given twelve (12) month period is truly representative of long-term weather patterns? This language could force an applicant to gather several years of meteorological data in an attempt to obtain twelve (12) months of data that is supposedly representative of long-term weather patterns. **Kennecott Uranium Company requests that the requirement should simply read "...twelve (12) consecutive months of meteorological data."**

Description and Design of Proposed Facility - Conventional Uranium Mill Facilities (Section 3.1)

Section 3.1.1 Areas of Review states:

The staff should review the description of the conventional uranium mill facilities provided in the application including:

(1) A review of descriptions of the ore to be milled including, but not limited to, the estimated volume of ore-bearing rocks to be processed, the average grade of ore, and the mineral content of the ore.

Rather than requesting specific descriptions of the ore to be processed which could change over time as some mines close and others open, it may be best to just request basic operating parameters for the mill that would include a basic window of materials that it is being designed to accept. .

This statement leads the reader to believe that the conventional mill facility will be solely processing "...ore-bearing rocks..." This is not the case with uranium mills. Conventional mills may also process alternate feed materials in addition to "...ore-bearing rocks..." In addition, the processing of alternate feed materials is an activity that produces byproduct material and as per the *Executive Summary* is uranium recovery since the *Executive Summary* states in part:

"Uranium recovery is any activity that produces byproduct material..."

Specific discussion should be included in Section 3.1 regarding the processing of alternate feed. References should be provided in the references section (Section 3.1.5) of Section 3.1 to:

- SECY-99-012 - USE OF URANIUM MILL TAILINGS IMPOUNDMENTS FOR THE DISPOSAL OF WASTE OTHER THAN 11e.(2) BYPRODUCT MATERIAL AND REVIEWS OF APPLICATIONS TO PROCESS MATERIAL OTHER THAN NATURAL URANIUM ORES
- COMMISSION VOTING RECORD - DECISION ITEM: SECY-99-012 - USE OF URANIUM MILL TAILINGS IMPOUNDMENTS FOR THE DISPOSAL OF WASTE OTHER THAN 11e.(2) BYPRODUCT MATERIAL AND REVIEWS OF APPLICATIONS TO PROCESS MATERIAL OTHER THAN NATURAL URANIUM ORES
- STAFF REQUIREMENTS - SECY-99-0012 - USE OF URANIUM MILL TAILINGS IMPOUNDMENTS FOR THE DISPOSAL OF WASTE OTHER THAN 11e.(2) BYPRODUCT MATERIAL AND REVIEWS OF APPLICATIONS TO PROCESS MATERIAL OTHER THAN NATURAL URANIUM ORES
- RIS 00-023: Recent Changes to Uranium Recovery Policy and specifically to:
 - Interim Guidance on Disposal of Non-Atomic Energy Act of 1954, Section 11e. (2) Byproduct Material in Tailings Impoundments and;
 - Interim Position and Guidance on the Use of Uranium Mill Feed Material Other Than Natural Ores

Conventional uranium mills may also accept ion exchange resins loaded with uranium for elution. This should be discussed as well and the following document included in the references:

- NRC REGULATORY ISSUE SUMMARY 2012-06 NRC POLICY REGARDING SUBMITTAL OF AMENDMENTS FOR PROCESSING OF EQUIVALENT FEED AT LICENSED URANIUM RECOVERY FACILITIES (ML110470571 - <http://pbadupws.nrc.gov/docs/ML1104/ML110470571.pdf>)

If the proposed facility is on Federal lands managed by the Bureau of Land Management (BLM) or the U.S. Forest Service (USFS), they will be involved in the permitting process for the mill facility. Their role should be discussed, especially in light of the Memorandum of Understanding (MOU) dated November 30, 2009 between the Nuclear Regulatory Commission (NRC) and the Bureau of Land Management (BLM) regarding development of uranium or thorium resources on public lands, including Federal mineral estates, under the administration of the Bureau of Land Management (BLM).

Description and Design of Proposed Facility - Heap Leach Facilities (Section 3.2)

The Environmental Protection Administration (EPA) has a rulemaking in place with a final rule anticipated later in 2014 regarding 40 CFR Part 61 Subpart W. The comment period closed on the proposed rule on October 27, 2014. Public hearings were held in Denver, Colorado in September 2014. This proposed rule (Federal Register /Volume 79, Number 85 / Friday, May 2, 2014 / Proposed Rules) if made final as proposed will have profound impacts on the siting, design and operation of uranium heap leach facilities. There is no discussion whatsoever in the Plan document regarding the rulemaking. Kennecott Uranium Company has the following questions regarding this section and the rulemaking which should be answered/addressed in this document:

- Will the Nuclear Regulatory Commission (NRC) be the lead reviewing and approving agency for heap leach facilities or will approvals from both the Environmental Protection Agency (EPA) and the Nuclear Regulatory Commission (NRC) be required?
- If the proposed facility is on Federal land managed by the Bureau of Land Management (BLM) its potential role should be discussed. The Nuclear Regulatory Commission (NRC) and the Bureau

of Land Management (BLM) entered into a Memorandum of Understanding (MOU) dated November 30, 2009 regarding development of uranium or thorium resources on public lands, including Federal mineral estates, under the administration of the Bureau of Land Management (BLM).

- If the proposed facility is on Federal lands managed by the U.S. Forest Service what role will they play in the process?
- Will the Nuclear Regulatory Commission (NRC) promulgate any conforming regulations (probably revisions to 40 CFR Part 40 Appendix A) in response to the rulemaking on 40 CFR Part 61 Subpart W or create any specific guidance related to it?
- Will specific guidance be incorporated in this document?

Section 3.2 states:

Heap and pad dimensions have been provided. The area of the pad base, number of Cells to be constructed and method(s) of their construction, height of each lift of ore placed for leaching, final pad height, equipment to be used and sequence of stacking ore, and slope of the heap have been adequately described.

The proposed rulemaking in 40 CFR part 61.252(c) states:

Heap leach piles shall be constructed in lined impoundments that are no more than 40 acres in area and shall comply with the requirements of 40 CFR 192.32(a)(1). The owner or operator shall have no more than two heap leach piles, including existing heap leach piles, in operation at any one time. The moisture content of heap leach piles shall be maintained at 30% or greater.

This language if incorporated in the final rule will fix the maximum area of the base pad and the number of cells to be constructed and operated at one time. It is recommended that the final version of this document not be released until such time as the rulemaking on 40 CFR Part 61 Subpart W becomes final and any specific conditions in it can be incorporated in this Standard Review Plan (SRP). Requirements from other Federal agencies are incorporated into this document such as those from the U.S. Federal Emergency Management Agency (FEMA), so incorporation of Environmental Protection Administration (EPA) requirements would not be inconsistent. Requirements from the Environmental Protection Administration (EPA) are incorporated in the document in the discussion in Section 3.5.3(7). Completion of the document may have to await publication of the final rule.

Please note that members of the uranium recovery industry (including Kennecott Uranium Company) have commented on the proposed 40 CFR Part 61 rulemaking, which may result in beneficial changes to the rules, therefore, delaying the Plan until those rules are final is prudent.

Design of Surface Impoundments (Section 3.3)

Section 3.3.2(5) - Areas of Review - Design of Surface Impoundments states:

Verify that the capacity of the surface impoundment would be sufficient to dispose all tailings and other byproduct material generated through the lifecycle of the facility.

This statement assumes that only byproduct material (including tailings) will be placed in a surface impoundment such as a tailings impoundment. In addition, the Plan fails to recognize that more than one

tailings impoundment may be required over the operating life of the facility. The need for multiple impoundments over the operating life of the facility should be discussed and addressed in the Plan.

STAFF REQUIREMENTS - SECY-99-0012 - USE OF URANIUM MILL TAILINGS IMPOUNDMENTS FOR THE DISPOSAL OF WASTE OTHER THAN 11e.(2) BYPRODUCT MATERIAL AND REVIEWS OF APPLICATIONS TO PROCESS MATERIAL OTHER THAN NATURAL URANIUM ORES states:

The disposal of material other than 11e.(2) byproduct material - which may include listed hazardous wastes - in mill tailings impoundments should be allowed only if: 1) there is adequate protection of the public health, safety, and the environment; 2) the long-term custodian of the site has indicated its willingness to accept responsibility for maintenance of the site prior to NRC approving the disposal; and 3) necessary approvals of other affected regulators (e.g., States, EPA) have been obtained. Regarding consent of the long-term custodian, consideration should be given to requiring written confirmation from DOE or the State that it would accept responsibility for the maintenance of the site prior to NRC approving the disposal of non-11e.(2) material.

Clearly material other than byproduct material may be placed in a tailings (surface) impoundment. The document should clearly state that there is a potential for this to occur and that a licensee may, provided that appropriate permission is obtained, place non-byproduct material in a tailings impoundment.

Section 3.3.5 - References should include references to the following documents:

- SECY-99-012 - USE OF URANIUM MILL TAILINGS IMPOUNDMENTS FOR THE DISPOSAL OF WASTE OTHER THAN 11e.(2) BYPRODUCT MATERIAL AND REVIEWS OF APPLICATIONS TO PROCESS MATERIAL OTHER THAN NATURAL URANIUM ORES
- COMMISSION VOTING RECORD - DECISION ITEM: SECY-99-012 - USE OF URANIUM MILL TAILINGS IMPOUNDMENTS FOR THE DISPOSAL OF WASTE OTHER THAN 11e.(2) BYPRODUCT MATERIAL AND REVIEWS OF APPLICATIONS TO PROCESS MATERIAL OTHER THAN NATURAL URANIUM ORES
- STAFF REQUIREMENTS - SECY-99-0012 - USE OF URANIUM MILL TAILINGS IMPOUNDMENTS FOR THE DISPOSAL OF WASTE OTHER THAN 11e.(2) BYPRODUCT MATERIAL AND REVIEWS OF APPLICATIONS TO PROCESS MATERIAL OTHER THAN NATURAL URANIUM ORES
- RIS 00-023: Recent Changes to Uranium Recovery Policy and specifically to:
 - Interim Guidance on Disposal of Non-Atomic Energy Act of 1954, Section 11e. (2) Byproduct Material in Tailings Impoundments and;
 - Interim Position and Guidance on the Use of Uranium Mill Feed Material Other Than Natural Ores

Section 3.3.2 Review Procedures discusses the following:

(4) Verify that the design description of the surface impoundment is sufficiently detailed. This information should meet, in part, the requirements of 10 CFR 40.31(h) and 51 10 CFR Part 40, Appendix A, Criteria 1 and 4(b)-(d).

The surface impoundment being discussed is the tailings impoundment. Tailings impoundments are also regulated under 40 CFR Part 61 Subpart W which is currently in the rulemaking process (Federal Register /Volume 79, Number 85 / Friday, May 2, 2014 / Proposed Rules). The requirements from 40

CFR part 61 Subpart W should be referenced in this document. Requirements from other Federal agencies are referenced into this document such as those from the U.S. Federal Emergency Management Agency (FEMA), so incorporation of Environmental Protection Administration (EPA) requirements would not be inconsistent. Other requirements from the Environmental Protection Administration (EPA) are referenced in the document in the discussion in Section 3.5.3(7). Completion of the document may have to await publication of the final rule.

Section 3.5 - Waste Management

This section, in subsection 3.5.3 - *Acceptance Criteria* discusses handling liquid effluents stating:

If surface impoundments are considered as a method to dispose of liquid effluents, the proposed design of surface impoundments, the monitoring and inspection program and the corrective action plans are adequately designed to prevent migration of waste from the surface impoundments to the subsurface soil, groundwater, or surface water. The design, installation, and operation of surface impoundments at the proposed conventional uranium mill or heap leach site used to manage byproduct material are consistent with guidance provided in Regulatory Guide 3.11, Revision 3, (NRC, 2008, Section 1). Onsite retention ponds are designed and operated in a manner that prevents migration of liquid waste from the all surface impoundments to the uppermost aquifer.

The fact that a Corrective Action Program (CAP) may be required as per 40 CFR Part 192.33 in the event of *migration of liquid waste in the uppermost aquifer* should be discussed.

Any surface impoundments at licensed uranium recovery facilities are proposed to be regulated under 40 CFR Part 61 Subpart W. While this rulemaking (Federal Register /Volume 79, Number 85 / Friday, May 2, 2014 / Proposed Rules) is not final, if it is made final as proposed, it would require that these evaporation ponds, called Non-Conventional Impoundments in the proposed rule which defines them as:

A non-conventional impoundment can be located at any uranium recovery facility and contains uranium byproduct material suspended in and/or covered by liquids. These structures are commonly known as holding ponds or evaporation ponds. They are removed at facility closure.

The proposed rulemaking on 40 CFR Part 61 Subpart W requires that surface impoundments be double-lined like tailings impoundments when it states:

(b) Non-Conventional Impoundments. Non-conventional impoundments shall meet the requirements of 40 CFR 192.32(a)(1). During operation and until final closure begins, the liquid level in the impoundment shall not be less than one meter.

This needs to be addressed in the document. The requirements from 40 CFR part 61 Subpart W should be referenced in this document. Requirements from other Federal agencies are incorporated into this document such as those from the U.S. Federal Emergency Management Agency (FEMA), so incorporation of Environmental Protection Administration (EPA) requirements would not be inconsistent. Completion of the document may have to await publication of the final rule.

Radiation Safety Controls and Monitoring - Bioassay Program

This section references Regulatory Guide 8.22 47 (NRC, 1988). It should reference the final version of draft regulatory guide (DG), *DG-8054 - Applications of Bioassay for Uranium* which should be final before the final version of this document is complete and *REGULATORY GUIDE 8.22 - BIOASSAY AT URANIUM MILLS May 2014 - Revision 2*.

Radiation Safety Controls and Monitoring - Contamination Control Program

Regarding monitoring of personnel, the document states:

Ensure that radiation surveys of workers will be conducted to prevent contaminated employees from entering clean areas or from leaving the site consistent with guidance in Regulatory Guide 8.30, Health Physics Surveys in Uranium Recovery Facilities, Revision 1 (NRC, 2002). This information should meet, in part, the requirements of 10 CFR 20.1501.

Regarding monitoring of equipment or scrap, the document states:

Ensure that the applicant will make a comprehensive radiation survey in conformance with Regulatory Guide 8.30, Revision 1 (NRC, 2002, Section 2), which establishes contamination is within the limits specified in Guidance Directive FC 83-23 (NRC, 1993, Appendix G) and is ALARA before equipment or scrap is released for unrestricted use.

Kennecott Uranium Company requests that the following table and text from *Regulatory Guide 8.30, "Health Physics Surveys in Uranium Recovery Facilities* be inserted directly in the text of the document to eliminate any ambiguity regarding the monitoring requirements for release to unrestricted area for personnel, equipment or scrap:

Limits on acceptable levels of alpha contamination of skin and clothing are found in Table 2. They are to be used in the following manner: All alpha contamination on skin and clothing should be considered to be removable so that the limit of 1,000 dpm alpha per 100 cm² applies.

Surface contamination surveys should be conducted before potentially contaminated equipment is released to unrestricted areas. The surface contamination limits listed in Table 2 are recommended. If contamination above these limits is detected, the equipment should be decontaminated until additional efforts do not significantly reduce contamination levels.

TABLE 2		
Surface Contamination Levels for Uranium and Daughters on Equipment To Be Released for Unrestricted Use, on Clothing, and on Nonoperating Areas of UR Facilities*		
Average**	5,000 dpm alpha per 100 cm ²	Average over no more than 1m ²
Maximum**	15,000 dpm alpha per 100 cm ²	Applies to an area of not more than 100 cm ²
Removable	1,000 dpm alpha per 100 cm ²	Determined by smearing with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the smear
<p>* These values are taken from Regulatory Guide 1.86, "Termination of Operating Licenses for Nuclear Reactors" (Ref. 23), and from "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct Source; or Special Nuclear Material," Division of Fuel Cycle and Material Safety, USNRC, Washington, DC 20555, August 1987 (Ref. 24). Available in NRC Public Document Room for inspection and copying for a fee.</p> <p>** The value includes both fixed and removable contamination. (The contamination levels in Table 2 are given in units of dpm/100 cm² because this is the minimum area typically surveyed. When performing a smear or wipe test, the area should roughly approximate 100 cm². However, there is no need to be precise about the area to be smeared.)</p>		

Since *Regulatory Guide 1.86 - Termination of Operating Licenses for Nuclear Reactors* and *Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct Source, or Special Nuclear Material*, Division of Fuel Cycle and Material Safety, USNRC, Washington, DC 20555, August 1987 are referenced in the current applicable regulatory guide (*Regulatory Guide 8.30, "Health Physics Surveys in Uranium Recovery Facilities"*) **they should be the rules referenced in this document. All references to *Guidance Directive FC 83-23, Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material*. Washington, DC: NRC, Division of Fuel Cycle Safety and Safeguards. 1993 should be removed in favor of the release guidance referenced in *Regulatory Guide 8.30, "Health Physics Surveys in Uranium Recovery Facilities."*** Applicants require clearly referenced standards to which they must adhere when preparing license applications and as such this table should be included.

Kennecott Uranium Company appreciates the opportunity to comment on this draft standard review plan. If you have any questions please do not hesitate to contact me.

Sincerely yours,

Oscar A Paulson

Oscar Paulson
Facility Supervisor

cc: Rich Atkinson
Katie Sweeney - National Mining Association (NMA)