November 21, 2011

- MEMORANDUM TO: Bill Von Till, Chief **Uranium Recovery Licensing Branch** Decommissioning and Uranium Recovery Licensing Directorate **Division of Waste Management** and Environmental Protection Office of Federal and State Materials and Environmental Management Programs FROM: John T. Buckley, Senior Project Manager /RA/ Reactor Decommissioning Branch Decommissioning and Uranium Recovery Licensing Directorate Division of Waste Management and Environmental Protection Office of Federal and State Materials and Environmental Management Programs
- SUBJECT: PUBLIC MEETING SUMMARY FOR THE TITAN URANIUM INC. PRE-SUBMISSION AUDIT FOR THE PROPOSED SHEEP MOUNTAIN PROJECT

On October 25 – 27, 2011, the U.S. Nuclear Regulatory Commission held a public meeting with Titan Uranium, Inc. at the Titan Uranium USA / BRS Engineering Inc. office in Riverton, WY. The purpose of the meeting was to tour the proposed Sheep Mountain Heap Leach facility and to audit the draft application prior to submission, to identify any major acceptance or technical review issues.

A summary of the meeting is enclosed.

Enclosure: Meeting Summary

- cc: Meeting Attendees (via email)
- CONTACT: John Buckley, FSME/DWMEP (301) 415-6607

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LGersey/RIV

#### ML113140131

Office	DWMEP	DWMEP	DWMEP	DWMEP
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Date	11/10/2011	11/15/2011	11/21/2011	11/21/2011

**OFFICIAL RECORD COPY** 

### **MEETING REPORT**

DATE: October 25 – 27, 2011

PLACE: Titan Uranium USA / BRS Engineering Inc. 1130 Major Way Riverton, WY 82501

PURPOSE: For the U.S. Nuclear Regulatory Commission (NRC) staff to tour the proposed Sheep Mountain Heap Leach Project site and to audit the application prior to submission to identify any major acceptance or technical review issues (see agenda – Attachment 1).

#### ATTENDEES:

See Attendees List (Attachment 2).

#### BACKGROUND:

On November 11, 2010, Titan Uranium USA Inc. (Titan) notified the U.S. Nuclear Regulatory Commission (NRC) of its intent to file an application for the proposed Sheep Mountain Uranium Project located in Freemont County, Wyoming. During a subsequent public meeting on May 24, 2011, Titan requested that NRC conduct an audit of the application prior to submission to identify any major acceptance or technical review issues. Titan's presentation and NRC's meeting summary are publicly available in ADAMS at Accession Numbers ML111740073 and ML111740059, respectively. Based on this request, the NRC conducted an audit of the draft application on October 25-27, 2011.

#### DISCUSSION:

On Tuesday October 25, 2011, meeting participants departed from the Titan offices in Riverton, WY to tour the proposed Sheep Mountain Uranium Project site. NRC staff informed the participants that the meeting was a Category 1 public meeting and that the draft application review would be conducted at Titan's office in Riverton, WY. The staff also informed the participants that a debriefing would be scheduled for Thursday, October 27, 2011, afternoon. Participants were informed that the draft application will not become part of the meeting summary, because it was not distributed to meeting attendees or removed from the premises by meeting attendees. Two members of the public attended the site tour.

#### NRC STAFF COMMENTS:

The NRC staff reviewed Titan's draft application, composed of separate technical and environmental reports. The staff's major comments are summarized as follows:

General Comments:

- The technical and environmental reports contain information which is repeated in several sections and between reports. Titan should thoroughly review the reports to ensure that the information is consistent in all sections before submittal. Inconsistencies will result in future Requests for Additional Information (RAIs).
- Titan should provide GPS coordinates for the NRC licensed site boundary.

## TECHNICAL REPORT (TR)

Radiation Protection Comments

- TR Section 2.5: Titan should provide the meteorology information in the TR (not referenced in the ER). This information is needed for dose calculations and needs to be available for the safety review. The TR did not include a comparison of the short-term and long-term data collected from a NWS station. The short-term data must be collected concurrently as the on-site data (i.e. during the same period) and the comparison must include a statistical analysis of the short-term and long-term data to demonstrate that the short-term data is representative of long-term conditions in order for the applicant to discontinue collecting on-site data.
- Throughout the TR, any commitment to meet DOT regulations must include a commitment to meet 10 CFR 71.5 requirements, which require licensees to follow specific DOT regulations.
- TR Section 5.7.6: The discussion regarding surveys for beta-gamma emitters is not consistent with 10 CFR 20.1501 (survey for potential hazards) or Regulatory Guide 3.46 (Standard Format and Content for ISRs). If the applicant proposes to only survey for alpha, the applicant will need to (1) demonstrate what the static and scan MDC for alpha measurements are, and (2) either (a) propose measuring betas or (b) relate the beta activity to the measured alpha activity. In order to have a relationship of alphas to betas, the applicant will need to account for all sources of alphas and betas, including potential alpha and beta sources that are not in equilibrium with the uranium. This would apply to personnel and the release of items for unrestricted use.
- The application relies heavily on calculations to determine the doses to the public from airborne contamination. These calculations must be verified through the use of measurements.
- The TR should contain analyses of radiological, non-radiological, and transportation accidents that include the results from operating experience at similar facilities, the procedures to be used to notify NRC in the event of radiological accidents, procedures to respond to and mitigate or remediate the likely consequences of radiological and nonradiological accidents, and a description of the radiological consequences of nonradiological accidents.

#### Hydrogeology / Geology Comments

• The application should include further characterization of hydrogeologic properties (hydraulic conductivity, specific yield, thickness, heterogeneity, etc.) of the uppermost aquifer (Battle Springs/Fort Union units) and hydrogeologic properties (vertical conductance, thickness, porosity, continuity, etc.) of the confining unit (Cody shale) underlying the site. The characterization data must be sufficient to assess potential adverse effects from the facility (e.g., spills, liner breach) to the uppermost aquifer. All data used to characterize the site-specific hydrogeology and geology i.e., well logs, pumping test, slug tests, etc. should be included for review.

Historical groundwater flow conditions influenced by dewatering of the pits and mine shafts near the facility should be evaluated to determine if dewatering during operations will affect groundwater flow and ultimately, the placement of compliance monitoring wells. This evaluation should include time series potentiometric surface maps to show historic influences from dewatering to assess changes to groundwater flow directions and hydraulic gradients influenced by dewatering during operations.

Additional site-scale legible geologic cross-sections are needed. Specifically, crosssections (i) below the heap leach pads and proposed surface impoundments, (ii) cutting through Crooks Creek, McIntosh pond, and unnamed pond, and (iii) across the dewatered region near the Sheep II shaft should be provided. Geologic units, existing groundwater level, structural features (folds and faults), and sampling locations should be depicted on these cross sections.

#### **Groundwater Monitoring Comments**

- The technical justification for the placement (location and depth) of the point of compliance wells should be discussed in the TR. A typical construction diagram for the proposed point of compliance wells should be included for review. The diagram should indicate the screened interval, filter pack, well diameter, borehole diameter, etc.
- The statistical methods used to establish any site-specific background values that will be used to set the primary and secondary groundwater protection standards should be discussed and justified. Along with all baseline data, the submittal should include; (i) sampled depths, (ii) formation(s) sampled, (iii) water elevations, (iv) distance from the disposal area/heap leach pad, (v) acceptable sampling techniques and analyses, (vi) comparison between sample results and other appropriate standards, and (vii) a summary of the data interpretation.

#### Surface Water Comment

 The technical basis for the surface water monitoring locations should be clearly stated. The TR should clearly describe how the monitoring program will effectively detect migration of contaminants from all potential site sources including an evaluation which demonstrates that the upgradient monitoring location will not be influenced by site derived contaminants. Influences from flooding of major streams or creeks within or near the proposed facility should be evaluated. This evaluation should include inundation maps to delineate the boundary associated with different flooding events.

### Engineering / Design Comments

- The application should be clear and consistent in identifying the operating parameters that would be approved under the license. For example, the identified yellowcake production capacity of the plant ranged between 1.5 and 2 million pounds per year and the project lifespan ranged from 15 to more than 20 years. These items should be consistent in the document and should be presented in a manner that bounds the proposed activities.
- The TR identifies activities that are under consideration or may be performed. The document should clearly identify proposed activities and avoid terms like "may include" or "this is under consideration." Using language like this leads to confusion amongst the staff and other interested parties as to what activities will be performed if the license were to be issued.
- The financial assurance estimate available for the staff to review lacked sufficient detail. The staff considers financial assurance estimates to be a critical component of the review and has cited inadequate financial assurance estimates as a reason for not accepting an application for detailed technical review. The financial assurance estimate should include references or sources for unit costs and quantities, basis for equipment efficiency rates, and basis for worker production estimates. Note that the financial assurance estimate should be based on an independent third party performing the work. Also note that while Criterion 9 allows for financial assurance instruments to be consolidated with instruments to meet the obligations of other state or federal agencies, the amount necessary for decommissioning, decontamination, reclamation, and long term care needs to be clearly identified and committed for use in accomplishing these activities. It may be advantageous to maintain a separate financial assurance instrument for NRC related activities.
- The liner design did not appear to include items such as: chemical resistance of the liner with the anticipated process solutions; resistance of the liner system to UV degradation; a crushing analysis for the pipes that comprise the liquid collection; consideration of liquefaction of the ore placed on the heap pads; or an analysis of the expected loads placed on the liner system during stacking of the ore.

#### Administrative Comments

Section 5.7.8, Quality Assurance, does not provide the detail needed to adequately
describe the Titan Quality Assurance Program. The TR provides a commitment to
develop a QA Program, but no elements of the QA Program are provided. The staff
considers quality assurance to be a critical component of an application and has cited
inadequate description of a QA Program as a reason for not accepting an application for
detailed technical review.

## ENVIRONMENTAL REPORT (ER)

- The ER should discuss the activities and potential environmental impacts from site construction and site reclamation/decommissioning. Sections 6.1.2 and 6.2.1.2 of NUREG-1748 discuss the types of information that should be provided.
- The ER discussion and details of the Proposed Action should be consolidated in a single chapter separate from the chapters discussing the affected environment and potential environmental impacts. This would aid the efficiency of the NRC staff's acceptance review of Titan's application should it be submitted.
- The ER discussion of mitigation measures identified measures that Titan is committing to and also those that Titan is proposing. Mitigation measures that Titan has committed to are part of the Proposed Action and therefore should be part of that discussion. Proposed mitigation measures may further reduce identified environmental impacts of the Proposed Action. Titan should review its mitigation measures in the ER to distinguish between those it is committing to, and those it is proposing. Titan should revise the ER accordingly.
- Regarding the ER's treatment of alternatives to the proposed action, it is recommended that Titan (1) clarify its process and bases for determining which alternatives were "practicable" or "practicably reasonable"; (2) reassess the alternatives considered in light of Titan's merger with Energy Fuels; and (3) provide more complete justifications for alternatives eliminated from detailed analysis.
- With respect to the assessment of cumulative impacts, many of the ER analyses were incomplete and inconsistent from one environmental resource area to the next. Titan should use a consistent approach to analyzing cumulative impacts to each of the environmental resource areas. This will help to ensure a consistent level of analysis and detail across the resource areas. Titan is referred to Section 4.2.5.2 of NUREG-1748 for more information on the identification and assessment of cumulative impacts.

# PUBLIC COMMENTS

Following a discussion of the NRC's comments, the public was invited to ask questions and/or make comments. Mr. Steve Jones, Wyoming Outdoor Council, commented that dust control during heap emplacement is a concern. Mr. Jones asked a number of questions regarding Titan's heap emplacement process and the measures Titan will use to control dust during operations. Mr. Jones asked about financial assurance requirements and the adequacy of such funds for monitoring of the site after transfer to the Department of Energy. Mr. Jones also commented that sage grouse habitat is a general concern in Wyoming, but the proposed licensed boundary is not within the sage-grouse core area.

ACTIONS: None

#### ATTACHMENTS:

- 1. Agenda
- 2. List of Attendees

# Titan Uranium, Inc. Sheep Mountain Heap Leach Facility Site Visit and Pre-Submission Application Review October 25 – 27, 2011 Riverton, Wyoming

## AGENDA

# October 25, 2011

Time	Торіс	Lead
7:00 am	Introductions	All
7:05 am	Leave Riverton for Site Tour	NA
8:00 am	Site Tour	Titan Staff
11:00 am	Return to Riverton	NA
12:00 pm	Lunch	
1:00 pm	Application Audit	NRC Staff
5:00 pm	Adjourn	

# October 26, 2011

Time	Торіс	Lead
7:00 am	Application Audit	NRC Staff
12:00 pm	Lunch	
1:00 pm	Application Audit	NRC Staff
5:00 pm	Adjourn	

# October 27, 2011

Time	Торіс	Lead
7:00 am	Application Audit	NRC Staff
12:00 pm	Lunch	
1:00 am	Audit Debrief	NRC/ Titan Staff
3:00 pm	Opportunity for Questions from Public	NA
5:00 pm	Adjourn	NA



# **MEETING ATTENDEES**

Date: October 25 - 27, 2011

Topic: Titan Uranium Inc. Proposed Sheep Mountain Project Heap Leach Facility

-		
NAME	AFFILIATION	PHONE NUMBER
John Buckley	USNRC	301-415-6607
Douglas T. Mandeville	USNRC	301-415-0724
Tanya Oxenberg	USNRC	301-415-6241
Matthew Meyer	USNRC	301-415-6198
James Park	USNRC	301-415-6935
Marla Roberts	CNWRA	210-867-3646
Patrick LaPlante	CNWRA	301-881-0291
Hakan Basagooglu	CNWRA	210-522-3522
Jim Durham	CNWRA	210-522-6934
Doug Beahm	BRS Inc.	307-857-3079
Harold Hutson	BRS Inc.	307-857-3079
Gregory Adams	Titan USA	307-265-6664
Toby Wright	Wright Environmental	970-231-1160
Steve Brown	Senes	303-524-1519
Chris Pugsley	Thompson & Pugsley, PLLC	202-496-0780

Date: October 25 - 27, 2011

Topic: Titan Uranium Inc. Proposed Sheep Mountain Project Heap Leach Facility

NAME	AFFILIATION	PHONE NUMBER
Sarah Wempen	BLM	307-332-8468
Rita Allen	BLM	307-332-8427
Karen Bryan	BLM	307-332-8441
Tom Sunderland	BLM	307-332-8412
Kristin Yannone	BLM	307-332-8448
John Erickson	DEQ / Land Quality	307-332-3047
Erik Molvar	Biodiversity Conservation Alliance	307-742-7978
Steve Jones	Wyoming outdoor Council	307-332-7031 x12