

**UTAH DIVISION OF RADIATION CONTROL**  
**URANIUM ONE, INC.**  
**SHOOTARING CANYON URANIUM PROCESSING FACILITY**  
**REQUEST TO RESUME OPERATIONS**

**INTERROGATORIES – ROUND 2**

**AUGUST 24, 2007**

## TABLE OF CONTENTS

Section	Page
ACRONYMS AND ABBREVIATIONS .....	2
SUMMARY OF REQUESTED ITEMS.....	4
INTERROGATORY R313-24-1(3)-02/02: SUMMARY OF REGULATORY REQUIREMENTS.....	6
INTERROGATORY R313-24-1(3)-03/02: SHIPMENT PREPARATION.....	7
INTERROGATORY R313-24-4-05/02: DAILY INSPECTIONS OF WASTE TAILINGS.....	9
INTERROGATORY R313-24-4-06/02: MAINTAINING RECORDS .....	12
INTERROGATORY R313-24-4-07/02: NOTIFICATION REQUIREMENTS.....	14
INTERROGATORY R313-24-4-12/02: SOIL FINAL STATUS SURVEY FOR SITE DECOMMISSIONING.....	17
INTERROGATORY R313-24-1-14/02: MILLING OPERATIONS .....	18
INTERROGATORY R313-24-4-16/02: SEISMIC HAZARD CHARACTERIZATION .....	21
INTERROGATORY R313-24-4-19/02: DOUBLE LINER SYSTEM CQAP PLAN AND SPECIFICATIONS.....	23
INTERROGATORY R313-24-4-20/02: LINER STRENGTH & COMPATIBILITY .....	26
INTERROGATORY R313-24-4-21/02: LINER SETTLEMENT .....	28
INTERROGATORY R313-24-4-22/02: LEACHATE COLLECTION AND DETECTION SYSTEM DESIGN.....	29
INTERROGATORY R313-24-4-23/02: DIKE INTEGRITY .....	32
INTERROGATORY R313-24-4-24/02: BEST AVAILABLE TECHNOLOGY .....	34
INTERROGATORY R313-24-4-26/02: INFILTRATION AND CONTAMINANT TRANSPORT MODELING .....	36
INTERROGATORY R317-6-2.1-27/02: GROUNDWATER MONITORING.....	39
INTERROGATORY R317-6-6.3F-28/02: INFORMATION ON EFFLUENT DISCHARGE RATES...	42
INTERROGATORY PR R317-6-6.3G-29/02: SURFACE WATER CONTROLS.....	43
INTERROGATORY R313-24-4-30/02: GEOLOGIC, HYDROLOGIC, AND AGRICULTURAL DESCRIPTION .....	45
INTERROGATORY R313-24-4-33/02: POST-CLOSURE DRAINAGE AND EROSION CONTROLS AND POSTCLOSURE MAINTENANCE.....	47
INTERROGATORY R313-24-4-34/02: RADON RELEASE MODELING.....	49
INTERROGATORY R313-24-4-36/02: OPERATIONAL DUST CONTROL.....	52
INTERROGATORY R313-24-4-37/02: COST ESTIMATES FOR DECOMMISSIONING AND RECLAMATION .....	53
INTERROGATORY R313-24-4-38/02: LONG TERM SURVEILLANCE COSTS .....	56

## ACRONYMS AND ABBREVIATIONS

ALARA	As Low As Reasonably Achievable
BAT	Best Available Technology
CCQAP	Construction Control Quality Assurance Plan
CFR	Code of Federal Regulations
COD	Chemical Oxygen Demand
DOT	US Department of Transportation
DQO	Data Quality Objectives
EPCRA	Emergency Planning and Community Right-to-Know Act of 1986
EPPC	Evaporation and Process Pond Cell
FML	Flexible Membrane Liner
GPD	Gallons per Day
GPM	Gallons per Minute
HDPE	High Density Polyethylene
LCRS	Leachate Collection and Removal System
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
mg/l	Milligram per liter
MHGA	Maximum Predicted Horizontal Ground Acceleration
NBS	National Bureau of Standards
pCi/g	Picocurie per gram
PE	Potential Evaporation
PET	Potential Evapotranspiration
QAP	Quality Assurance Plan
QAPP	Quality Assurance Project Plan
RMTP	Reduced Moisture Tailings Placement
SARA	Superfund Amendments and Reauthorization Act
SDR	Standard Dimension Ratio

SOP	Standard Operating Procedures
TEDE	Total Effective Dose Equivalent
TMP	Tailings Management Plan
TRDP	Tailings Reclamation and Decommissioning Plan
TSS	Total Suspended Solids
URCR	Utah Radiation Control Rules

## **SUMMARY OF REQUESTED ITEMS**

Please note information previously submitted to DRC may be provided by reference. However, each reference should be clear and specific or focused, i.e., the reference should include the title, author, date, page, and paragraph that included the information referenced, and how the reference is pertinent. Please refer to the interrogatories for the context of the item requests.

1. Provide additional summary information in support of the facility siting into the TMP.
2. Additional clarifications on select standard operating procedures.
3. Clarifications on the final status survey.
4. Additional information and clarifications on the milling operations.
5. Additional information on the seismic evaluation for the site.
6. Include an organization chart in the CQAP.
7. Confirmation of permeability of the clay liner.
8. Additional clarification on the liner design calculations.
9. Clarification on the use of RMTP and placement of tailings as slurry. This will impact the design requirements and basis for the liner and the cover system.
10. Clarifications on the drainage layer fabric and sand in the liner system.
11. Complete cell plans and specifications that are certified by a Professional Engineer in the State of Utah that cover the construction of the cell are needed before the design can be approved and a construction permit issued. They need to be of the quality that can be used for construction.
12. Estimated capacity of the leachate collection system.
13. Clarifications on the type of pipe to use in the leachate collection system.
14. Additional justification or analysis that demonstrates that the cover will not experience unacceptable degradation through time.
15. Additional information and clarifications on the proposed groundwater monitoring.
16. An evaluation of the potential discharge of tailings solution to groundwater.
17. Expanded design for surface water control during operations.
18. Clarifications on cover parameters used in the radon modeling for the cover.
19. Clarifications and additional information on the proposed post closure erosion controls.
20. Additional information on proposed dust control.

21. Additional information on the basis for cost estimates provided.

## **INTERROGATORY R313-24-1(3)-02/02: SUMMARY OF REGULATORY REQUIREMENTS**

### **PRELIMINARY FINDING:**

*Refer to R313-24-1(3): The requirements of Rule R313-24 are in addition to, and not substitution for, the other applicable requirements of Title R313. In particular, the provisions of Rules R313-12, R313-15, R313-18, R313-19, R313-21, R313-22, and R313-70 apply to applicants and licensees subject to Rule R313-24.*

### **INTERROGATORY STATEMENT:**

*Please provide the following revisions and clarifications in Section 2.0 of the Tailings Management Plan:*

- 1. Reference should be made to the sections in the plan (or other documents) that address the specific requirements presented in this section.*
- 2. Section 2.1.1 has a reference to 10 CFR 40 Appendix A, Criteria 1, which also needs to address sighting as it relates to isolation and minimizing disturbance and dispersion. This includes remoteness from populated areas, hydrologic and other natural conditions that contribute to immobilization and isolation of contamination from groundwater sources, potential for minimizing erosion, disturbance, and dispersion by natural forces. Uranium One stated in their response to this request in Round 1 that since the site exists and the impoundment structure is in place, that this information is not necessary. It is recognized that this is the case; however, a summary of how the site meets this criteria is still needed in the document. Reference can be made to supporting documents as appropriate.*

### **BASIS FOR INTERROGATORY:**

*Section 2 of the Tailings Management Plan appears to be a summary of the regulatory requirements and how the proposed tailings management will meet these regulations. This is a useful summary. However, to make section 2 complete, there needs to be additional clarifications. Uranium One did provide some of these clarifications in the response to Round 1 Interrogatory. However, additional information would be helpful as described the Interrogatory Statement above.*

### **REFERENCES:**

*Plateau Resources, Ltd., "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility" Amended December, 2005.*

*Plateau Resources, Ltd., "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility" Amended December, 2005, Revised April 2007.*

*Plateau Resources, Ltd., Responses to Round 1 TMP Interrogatories, April 2007.*

## **INTERROGATORY R313-24-1(3)-03/02: SHIPMENT PREPARATION**

### **PRELIMINARY FINDING:**

*Refer to R313-24-1(3) [R313-19-100(3)(a)]: Each licensee who transports licensed material outside the site of usage, as specified in the license, or where transport is on public highways, or who delivers licensed material to a carrier for transport, shall comply with the applicable requirements of the U.S. Department of Transportation (DOT) regulations in 49 CFR 170 through 189 (2002) appropriate to the mode of transport.*

*(i) The licensee shall particularly note DOT regulations in the following areas:*

*(A) Packaging--49 CFR 173.1 through 173.13, 173.21 through 173.40, and 173.401 through 173.476;*

*(B) Marking and labeling--49 CFR 172.300 through 172.338, 172.400 through 172.407, 172.436 through 172.440, and 172.400 through 172.450;*

*(C) Placarding--49 CFR 172.500 through 172.560 and Appendices B and C;*

*(D) Accident reporting--49 CFR 171.15 and 171.16;*

*(E) Shipping papers and emergency information--49 CFR 172.200 through 172.205 and 172.600 through 172.606;*

*(F) Hazardous material employee training--49 CFR 172.700 through 172.704; and*

*(G) Hazardous material shipper/carrier registration--49 CFR 107.601 through 107.620.*

### **INTERROGATORY STATEMENT:**

*In addition to the Transportation Plan provided as Appendix A of the revised License Amendment Request, please provide a description of the substantive content of each procedure listed in Appendix A, Section 2.2. Moreover, please provide a general outline for these procedures.*

*Please address the following questions in connection with information presented in Appendix A or the License Amendment Request:*

- 1. Appendix A, Section 4: Please state the criteria Uranium One will use in specifying transportation routes to transportation contractors.*
- 2. Appendix A, Section 5.1, Uranium One Responsibilities: Explain how Uranium One will determine whether emergency response plans provided by the Transportation Contractors will be adequate.*
- 3. Appendix A, Section 5.2: Provide an organization chart that shows relationships among the positions identified in the Transportation Plan.*
- 4. Appendix A, Section 6: State the 49 CFR regulatory requirements that will apply to material packaging and that Uranium One will ensure are satisfied by implementation of future procedures.*



5. *Appendix A, Section 6.2: State the 49 CFR regulatory requirements that will apply to Making and labeling and that Uranium One will ensure are satisfied by implementation of future procedures.*
6. *Appendix A, Section 6.3: State the 49 CFR regulatory requirements that will apply to shipping papers and that Uranium One will ensure are satisfied by implementation of future procedures.*
7. *Appendix A, New Section: State the 49 CFR regulatory requirements that will apply to accident reporting and that Uranium One will ensure are satisfied by implementation of future procedures. Commit to developing procedures that address accident reporting.*
8. *Appendix A, Section 7.2: State the 49 CFR regulatory requirements that will apply to Employee training and that Uranium One will ensure are satisfied by implementation of future procedures.*

**BASIS FOR INTERROGATORY:**

*Although the Division is agreeable to the proposal to provide actual implementing procedures in the future, prior to commencing yellowcake production, we must have a better idea of the substance of these procedures. Appendix A of the License Amendment Request is a good overview of topics to be addressed in the Transportation Plan but is incomplete when compared to the regulatory requirements of URCCR R313-24-1(3) and R313-19-100(3).*

*In addition to the information requested above, the Division will include a license condition requiring that implementing procedures be developed and submitted for Division's review and approval prior to yellowcake production.*

**REFERENCES**

*Plateau Resources, Ltd., "Transportation Plan for Plateau Resources," Appendix A of PRL License Amendment Request (New License Application Final.pdf), file dated 12/20/06.*

*Plateau Resources, Ltd., "Shootaring Canyon Uranium Processing Facility Environmental Report, Source Material License No. UT0900480", Dated January 2006.*

## **INTERROGATORY R313-24-4-05/02: DAILY INSPECTIONS OF WASTE TAILINGS**

### **PRELIMINARY FINDING:**

*Refer to R313-24-4, 10 CFR 40.26(c)(2): The documentation of daily inspections of tailing or waste retention systems and the immediate notification of the Executive Secretary, of any failure in a tailing or waste retention system that results in a release of tailings or waste into unrestricted areas, or of any unusual conditions (conditions not contemplated in the design of the retention system) that if not corrected could lead to a failure of the system and result in a release of tailings or waste into unrestricted areas; and any additional requirements the Executive Secretary may by order deem necessary. The licensee shall retain this documentation of each daily inspection as a record for three years after each inspection is documented.*

*Refer to R313-24-4, 10 CFR 40 Appendix A(8)(a): Daily inspections of tailings or waste retention systems must be conducted by a qualified engineer or scientist and documented. The licensee shall retain the documentation for each daily inspection as a record for three years after the documentation is made. The Executive Secretary, must be immediately notified of any failure in a tailings or waste retention system that results in a release of tailings or waste into unrestricted areas, or of any unusual conditions (conditions not contemplated in the design of the retention system) that is not corrected could indicate the potential or lead to failure of the system and result in a release of tailings or waste into unrestricted areas.*

*Refer to R317-6-6.3 (O): Unless otherwise determined by the Executive Secretary, applicant for a groundwater discharge permit ...shall include the following information: O. Methods and procedures for inspections of the facility operations and for detecting failure of the system.*

### **INTERROGATORY STATEMENT:**

*Please provide the SOP or include a section in the TMP that details documentation of daily inspections of the tailings and waste retention system. Ensure that this information includes a commitment to notify the Executive Secretary of any failure of any system that could result in a release of tailings or waste unto unrestricted areas or of any unusual conditions that, if not corrected, might lead to a failure of the system.*

*Ensure that the SOP addresses inspections to be performed to include, but not be limited to:*

- *Decant systems*
- *Effluent from under drain pipes*
- *Pond water elevation*
- *Slurry transport system inspection*
- *Retention dam inspection*
- *Diversion and storm water channel inspection*
- *Embankment Settlement*
- *Embankment Slope Conditions*

- *Seepage*
- *Slope Protection*
- *Emergency Discharge Facility*
- *Safety and Performance Instrumentation*
- *Operation and Maintenance Features*
- *Postconstruction Changes*
- *Inspections following significant earthquakes, tornadoes, floods, intense rainfalls, or other unusual events.*
- *Groundwater Monitoring systems*
- *Tailings piles*

*Ensure that the SOP specifies that the following information will be included in the annual BAT Report for the facility:*

- *Completed inspection reports*
- *Engineering data compilation*
- *General project data*
- *As-built drawings and photographs*
- *Hydrologic and hydraulic data*
- *Test results*
- *Applicable correspondence*
- *Names of the inspector and responsible supervisor*

*Revise the inspection plan to explicitly describe conditions under which the Executive Secretary will be notified.*

*Please provide Form AP-3C that is cited but not provided in SOP AP-3 Section 7.*

**BASIS FOR INTERROGATORY:**

*Section 5.4 of the Tailings Management Plan (TMP) states that a revised SOP for the Tailings Dam and Facilities Inspection Program will be developed to address the tailings dam inspection program. The Division requires that an applicant for a groundwater discharge permit must include methods and procedures for inspections of the facility operations and for detecting failure of the system. The procedures must address written documentation of daily inspections and immediate notification of potential breaches to waste retention systems.*

*SOP AP-3 Section 7.4 references Form AP-3C to document unusual conditions, but this form is not provided.*

**REFERENCES:**

*Plateau Resources, Ltd., "Tailings Reclamation and Decommissioning Plan for Shootaring Canyon Uranium Project", Dated December, 2005.*

*Plateau Resources, Ltd., "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility" Amended April 2007.*

*Plateau Resources, Ltd., "Shootaring Canyon Uranium Processing Facility Environmental Report, Source Material License No. UT0900480", Dated January 2006.*

*NRC. Regulatory Guide 3.11, "Design, Construction, and Inspection of Embankment Retention Systems for Uranium Mills." Washington DC. NRC December 1977.*

*NRC. Regulatory Guide 3.11.1, "Operational Inspection and Surveillance of Embankment Retention Systems for Uranium Mills." Washington DC. NRC October 1980.*

## **INTERROGATORY R313-24-4-06/02: MAINTAINING RECORDS**

### **PRELIMINARY FINDING:**

*Refer to R313-12-51 (1); “licensee or registrant shall maintain records showing the receipt, transfer, and disposal of all sources of radiation”, and 10 CFR 40.61(a); “Each person who receives source or byproduct material pursuant to a license issued pursuant to the regulations in 10 CFR 40 shall keep records showing the receipt, transfer, and disposal of this source or byproduct material as follows:...”.- See requirements under 10 CFR 40.61(a)(1) through (4).*

*Refer to R313-22; Persons licensed under Rule R313-22 shall keep records of information important to the decommissioning of a facility in an identified location until the site is released for unrestricted use. Before licensed activities are transferred or assigned in accordance with Subsection R313-19-34(2), licensees shall transfer all records described in Subsections R313-22-35(7)(a) through (d) to the new licensee. In this case, the new licensee will be responsible for maintaining these records until the license is terminated. If records important to the decommissioning of a facility are kept for other purposes, reference to these records and their locations may be used.*

### **INTERROGATORY STATEMENT:**

*Please address the following questions regarding the new Standard Operating Procedure HP-25:*

- 1. Please provide the Uranium One form that will be used in connection with Section 7.3, “Document and Verify the Amount of Tailings Placed in Tailings Facility.” Ensure that the tasks identified in this section describe how a technician will determine the quantity of tailings that any sample represents and the quantity of tailings actually added to the Tailings Facility.*
- 2. Include Uranium One Form 25-4 in the list presented in Section 9.*
- 3. Describe the transfer of records that Uranium One will ensure occurs should the license be transferred to a new licensee.*

### **BASIS FOR INTERROGATORY:**

*Although the SOP HP-25 provides an excellent description of the activities that will be taken to ensure that records accurately reflect the tracking and balance of radioactive materials, it lacks the details identified in the interrogatory statement.*

### **REFERENCES:**

*Plateau Resources, Ltd., “Shootaring Canyon Uranium Processing Facility Environmental Report, Source Material License No. UT0900480”, Dated January 2006.*

*Plateau Resources, Ltd., “Tailings Management Plan for Shootaring Canyon Uranium Processing Facility” Amended December 2005.*

*Plateau Resources, Ltd., “Tailings Reclamation and Decommissioning Plan for Shootaring Canyon Uranium Project”, Dated December 2005.*

## **INTERROGATORY R313-24-4-07/02: NOTIFICATION REQUIREMENTS**

### **PRELIMINARY FINDING:**

*Refer to R313-24-4, R313-19-50: Licensees shall notify the Executive Secretary as soon as possible but not later than four hours after the discovery of an event that prevents immediate protective actions necessary to avoid exposures to radiation or radioactive materials that could exceed regulatory limits or releases of licensed material that could exceed regulatory limits. Events may include fires, explosions, toxic gas releases, etc.*

*(2) The following events involving licensed material require notification of the Executive Secretary by the licensee within 24 hours:*

*(a) an unplanned contamination event that:*

*(i) requires access to the contamination area, by workers or the public, to be restricted for more than 24 hours by imposing additional radiological controls or by prohibiting entry into the area;*

*(ii) involves a quantity of material greater than five times the lowest annual limit on intake specified in Appendix B of 10 CFR 20.1001 through 20.2402 (2000), which is incorporated by reference, for the material; and*

*(iii) has access to the area restricted for a reason other than to allow radionuclides with a half-life of less than 24 hours to decay prior to decontamination; or*

*(b) an event in which equipment is disabled or fails to function as designed when:*

*(i) the equipment is required by rule or license condition to prevent releases exceeding regulatory limits, to prevent exposures to radiation and radioactive materials exceeding regulatory limits, or to mitigate the consequences of an accident;*

*(ii) the equipment is required by rule or license condition to be available and operable; and*

*(iii) no redundant equipment is available and operable to perform the required safety function; or*

*(c) an event that requires unplanned medical treatment at a medical facility of an individual with spreadable radioactive contamination on the individual's clothing or body; or*

*(d) an unplanned fire or explosion damaging licensed material or a device, container, or equipment containing licensed material when:*

*(i) the quantity of material involved is greater than five times the lowest annual limit on intake specified in Appendix B of 10 CFR 20.1001 through 20.2402 (2000), which is incorporated by reference, for the material; and*

*(ii) the damage affects the integrity of the licensed material or its container.*

*(3) Preparation and submission of reports. Reports made by licensees in response to the requirements of Section R313-19-50 must be made as follows:*

(a) licensees shall make reports required by Subsections R313-19-50(1) and (2) by telephone to the Executive Secretary. To the extent that the information is available at the time of notification, the information provided in these reports must include:

- (i) the caller's name and call back telephone number;
- (ii) a description of the event, including date and time;
- (iii) the exact location of the event;
- (iv) the radionuclides, quantities, and chemical and physical form of the licensed material involved; and
- (v) available personnel radiation exposure data.

(b) Written report. A licensee who makes a report required by Subsections R313-19-50(1) or (2) shall submit a written follow-up report within 30 days of the initial report. Written reports prepared pursuant to other rules may be submitted to fulfill this requirement if the reports contain all of the necessary information and the appropriate distribution is made. These written reports shall be sent to the Executive Secretary. The report shall include the following:

- (i) A description of the event, including the probable cause and the manufacturer and model number, if applicable, of equipment that failed or malfunctioned;
- (ii) the exact location of the event;
- (iii) the radionuclides, quantities, and chemical and physical form of the licensed material involved;
- (iv) date and time of the event;
- (v) corrective actions taken or planned and results of evaluations or assessments; and
- (vi) the extent of exposure of individuals to radiation or radioactive materials without identification of individuals by name.

**INTERROGATORY STATEMENT:**

*Please specify in SOP AP-4 that immediate notification means notification within four hours.*

*Please revise the procedure to clearly address constructed and engineered systems, in addition to mechanical equipment.*

**BASIS FOR INTERROGATORY:**

*The term "immediately" is defined in the regulations as occurring within four (4) hours.*

*While the above regulation speaks of "equipment," its scope, in connection with other regulations, includes mechanical equipment and other constructed and/or engineered systems.*

**REFERENCES:**

*Plateau Resources, Ltd., "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility" Amended April, 2007.*



*Plateau Resources, Ltd., “Shootaring Canyon Uranium Processing Facility Environmental Report, Source Material License No. UT0900480”, Dated January 2006.*

*NRC. Regulatory Guide 3.11, “Design, Construction, and Inspection of Embankment Retention Systems for Uranium Mills.” Washington DC. NRC December 1977.*

*NRC. Regulatory Guide 3.11.1, “Operational Inspection and Surveillance of Embankment Retention Systems for Uranium Mills.” Washington DC. NRC October 1980.*

## **INTERROGATORY R313-24-4-12/02: SOIL FINAL STATUS SURVEY FOR SITE DECOMMISSIONING**

### **PRELIMINARY FINDING:**

*Refer to R313-22-32(2): The Executive Secretary may, after the filing of the original application, and before the expiration of the license, require further statements in order to enable the Executive Secretary to determine whether the application should be granted or denied or whether a license should be modified or revoked.*

### **INTERROGATORY STATEMENT:**

*Please revise the Tailings Reclamation and Decommissioning Plan (TRDP) to include currently projected MARSSIM classifications for surface soils outside of the tailings area at the Shootaring Canyon facility. Please identify possible MARSSIM classifications for surface areas across the property under control of Plateau Resources, Ltd.*

*Please revise Section 3 of the TRDP to state which areas have been, or may be, classified as MARSSIM Class 1, 2, and 3 areas and include maps in Section 3 to identify and delineate these areas. Please provide clear definition of “known” Class 1 and 2 areas that presently exist.*

### **BASIS FOR INTERROGATORY:**

*The Round 1 Interrogatory response from Uranium One stated the following: “Soil area classification has been done for the known impacted areas (Class 1) and a buffer zone surrounding these areas (Class 2). The remainder of the site is assumed to be a Class 3. This is based on existing site conditions and process knowledge. Future mill use may require reclassification of certain areas. Contamination maps for Class 3 areas are provided in Section 3 of the Decommissioning Plan.”*

*Section 3 of the TRDP does not state which areas have been, or may be, classified as Class 1, 2, and 3 areas and the maps in Section 3 do not show these areas. It would be helpful to provide clear definition of “known” Class 1 and 2 areas to describe current conditions and modify Section 3 where appropriate to refer to Section 8.4 for additional description of protocol for cleanup and survey classification determinations.*

### **REFERENCES:**

*Abelquist, E. W. 2002. “Decommissioning Health Physics: A Handbook for MARSSIM Users,” ISBN 0750307617.*

*Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM), NUREG-1575, Rev. 1, Appendix D.*

*Pacific Northwest National Laboratory 2006b. Visual Sample Plan Version 4.4. Available at <http://dgo.pnl.gov/>*

*Plateau Resources, Ltd., “Tailings Reclamation and Decommissioning Plan for Shootaring Canyon Uranium Project”, Dated December, 2005.*

## **INTERROGATORY R313-24-1-14/02: MILLING OPERATIONS**

### **PRELIMINARY FINDING:**

*Refer to 313-24-4; 10 CFR 40.31(h); An application for a license to receive, possess, and use source material for uranium or thorium milling or byproduct material, as defined in this part, at sites formerly associated with such milling shall contain proposed written specifications relating to milling operations and the disposition of the byproduct material to achieve the requirements and objectives set forth in appendix A of this part. Each application must clearly demonstrate how the requirements and objectives set forth in appendix A of this part have been addressed. Failure to clearly demonstrate how the requirements and objectives in appendix A have been addressed shall be grounds for refusing to accept an application.*

### **INTERROGATORY STATEMENT:**

*In order to understand the handling and processing of the waste tailings and slurry, please provide the following information:*

- 1. A complete material/production flow diagram that including estimated production and material feed rates and the properties of the solids and liquids generated, starting at the ore pile and ending up in the tailings pile, and evaporation pond. The diagram should include the proposed locations and layout of the liquid extraction equipment, tailing placement equipment, secondary containment components, and transfer piping. Include descriptions of each piece of equipment, component, and process.*
- 2. The SOP for tailings dewatering (or liquid extraction) and placement based on the planned alternative dewatering (or liquid extraction) and placement methods. If Uranium One expects to operate the liquid extraction system without further regulatory review, the SOP should address tailings placement and contingency plans when the liquid extraction system is out of service.*
- 3. Explanation and justification that no adverse effects on tailings stability are expected with respect to the tailings already in the cell and the use of best available technology for groundwater protection. Please discuss effects if the tailings segregate and identify impacts on operations. Demonstrate through analyses that the environment (with emphasis on groundwater) will be appropriately protected.*
- 4. Demonstrate the compatibility of flexible membrane liner material with the “highly acidic process solutions” that will be held in the tailings impoundment.*

*Should Uranium One desire the license modification to allow the fluid extraction process without further regulatory review, a complete description of the systems components and tailings (paste) management operations must be provided to the Division. Include **at least** the following information:*

- 1. Describe how the tailings paste will be transported to and distributed within the tailings impoundment. Describe how localized accumulations of tailings paste and their attendant stresses on flexible membrane liners and the drainage system layer*

- will be limited to acceptable values. Justify that stresses will be acceptable as tailings paste is deposited and distributed according to the descriptions provided.*
2. *Provide specifications, quality control measures, and quality assurance measures applied during operations to ensure that the integrity and functions of the drainage collection and leakage detections system will not be compromised.*
  3. *All information requested in the Round One Interrogatory (replicated below for ease of reference).*

**BASIS FOR INTERROGATORY:**

*A material flow diagram should be provided that includes the production rates and the properties of the product generated, liquids generated, tailings generated, reagents used, losses, etc., starting at the ore pile and ending up in the tailings pile, and evaporation pond. This information is required to demonstrate that the objectives set forth in 10 CFR 40.31(h), Appendix A, have been addressed.*

*The Tailings Management Plan states that the fluid extraction system may be bypassed if it cannot accept the slurry. With respect to the placement of slurry that does not undergo fluid extraction, the previous interrogatory response stated: "There is no expected adverse affect on the tailings stability. There is a disadvantage in the placement of the tailings as a slurry in that the potential for above-grade placement is limited and the tailings are more likely to segregate."*

*Should Uranium One desire the license modification to allow the fluid extraction process without further regulatory review, a complete description of the systems components and tailings (paste) management operations must be provided to the Division. Otherwise, a supplemental regulatory review of the details of the fluid extraction system will be required.*

*The following Round 1 Interrogatory R313-24-1-14/01: Milling Operations is included for ease of reference in connection with details requested for the fluid extraction system:*

*Please provide the details of the tailings dewatering and tailing placement process. This includes:*

1. *Design criteria for the dewatering [fluid extraction] process and tailings placement into the cell.*
2. *Proposed location and layout of the dewatering [fluid extraction] equipment and transfer piping.*
3. *Detailed equipment and operational specifications and drawings of the dewatering [fluid extraction] and related tailings process equipment. This includes (but is not limited to) transfer piping to and from the equipment, the dewatering [fluid extraction] equipment, dewatered tailing placement equipment and methods, and secondary containment measures for tailings transfer and processing operations.*
4. *Quality control and assurance measures to be used to ensure tailings dewatering [fluid extraction] and placement meet design criteria and specifications.*
5. *Rate and make up of the slurry transferred to the dewatering [fluid extraction] area.*

6. *Rate and feed method into the press for dewatering [fluid extraction].*
7. *Feed staging and contingency plans when the dewatering [fluid extraction] system is out of service. It is stated that if the dewatering [fluid extraction] press cannot accept the slurry it will be placed into the cell. How will this impact the material in the cell (water content, stability, etc.)? Will it be removed again and dewatered [fluid extraction]?*

**REFERENCES:**

*Plateau Resources, Ltd., "Shootaring Canyon Uranium Processing Facility Environmental Report, Source Material License No. UT0900480", Dated January 2006.*

*Plateau Resources, Ltd., "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility" Amended April 2007.*

*Plateau Resources, Ltd., "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility" Amended December, 2005.*

## **INTERROGATORY R313-24-4-16/02: SEISMIC HAZARD CHARACTERIZATION**

### **PRELIMINARY FINDING:**

*Refer to Criterion 1 of 40 CFR Part 40, Appendix A, Criterion 1”... In the selection of disposal sites, primary emphasis must be given to isolation of tailings or wastes, a matter having long-term impacts, as opposed to consideration only of short-term convenience or benefits, such as minimization of transportation or land acquisition costs. While isolation of tailings will be a function of both site and engineering design, overriding consideration must be given to siting features given the long-term nature of the tailings hazards”;*

*Refer to Criterion 4 of 40 CFR Part 40, Appendix A, Criterion 4 (e)...The impoundment may not be located near a capable fault that could cause a maximum credible earthquake larger than that which the impoundment could reasonably be expected to withstand.”*

*Refer to Criterion 1 of 40 CFR Part 40, Appendix A, Criterion 6(1): ...[Uranium mill tailings disposal shall be] “in accordance with a design that provides reasonable assurance of control of radiological hazards to be effective for 1,000 years, to the extent reasonably achievable, but in any case for at least 200 years...” ;*

### **INTERROGATORY STATEMENT:**

*Please update the listing of earthquakes and other seismic data, at least through 2006, presented in Section 4 of the Tailings Reclamation and Decommissioning Plan for Shootaring Canyon Uranium Project (Revised December 2006).*

*Provide a copy of the State Engineer’s written confirmation that the stability analyses it reviewed are acceptable.*

*Provide a legible copy of the report from Lawrence Livermore National Laboratory; Seismic Hazard Analysis of Title II Reclamation Plans.*

### **BASIS FOR INTERROGATORY:**

*The applicant has revised Section 3 of the TMP with statements concerning the history of existing **facility stability analyses** at the site. However the information requested in Round 1 Interrogatory Statement (replicated below for convenience) is necessary to evaluate **current seismicity and adequacy of the basis for the MGHA**. The two documents requested present essential independent evaluations*

*The response provided to Round 1 Interrogatory R317-24-4-16/01 and contained in the “Tailings Management Plan does not satisfy the June 2006 interrogatory request (repeated below for convenience).*

*Please provide additional information to support the determination of an appropriate and consistent maximum predicted horizontal ground acceleration (MHGA) for the site. Please include sufficient information regarding historical seismicity and deterministic or probabilistic methodologies used to derive the estimated MHGA value, and to demonstrate that the proposed MHGA value reflects the most current information*

*available regarding predicted seismic hazard levels in eastern/southeastern Utah and the area including the site. Seismic stability analyses should be based on this MHGA value.*

*The following was the Basis for Interrogatory included with the Round 1 Interrogatory Statement (repeated below for convenience):*

*Additional information needs to be provided to justify that selection of the specified MHGA value of 0.19 g is appropriate for the site and that the stated value reflects the best information currently available for southeastern Utah/the project site. The only information provided in “Exhibit C – Seismic Hazard Analysis” to support determination of the 0.19 g value is page 91 from a referenced report (“June 26, 1994 Seismic Hazard Analysis of Title II Reclamation Plans”, Lawrence Livermore National Laboratory). Some of the information on that page is illegible (e.g., the exponent in the cited Hazard Level values); also, information items referenced on that page, including hazard curves, a methodology section, and Fault 2, Fault 3 locations are not provided for review. The 0.19 g value was used for a seismic stability analysis for the Shootaring Canyon Dam performed in 1997 (January 9, 1997 letter report by Inberg-Miller Engineers).*

*Newmark Analyses conducted in 1999 for the Shootaring Canyon Dam and Cross Valley Berm used a peak ground acceleration of 0.33 g based on a magnitude 6.5 earthquake (January 29 and June 14, 1999 letter reports by Inberg-Miller Engineers).*

**REFERENCES:**

*Plateau Resources, Ltd., “Tailings Management Plan for Shootaring Canyon Uranium Processing Facility” Amended April, 2007.*

*Plateau Resources, Ltd., “Tailings Management Plan for Shootaring Canyon Uranium Processing Facility” Amended December, 2005.*



## **INTERROGATORY R313-24-4-19/02: DOUBLE LINER SYSTEM CQAP PLAN AND SPECIFICATIONS**

### **PRELIMINARY FINDING:**

*Refer to R313-24-4, 10 CFR 40 Appendix A(5)(a)(1): Surface impoundments 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 subsoils, 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.*

*Refer to R317-3-1(1.7). 1.7. Construction Supervision. The applicant must demonstrate that adequate and competent inspection will be provided during construction. It is the responsibility of the applicant to provide frequent and comprehensive inspection of the project.*

*Refer to R317-3-10(4)(E). E. Construction Quality Control and Assurance. A construction quality control and assurance plan showing frequency and type of testing for materials used in construction shall be submitted with the design for review and approval. Results of such testing, gradation, compaction, field permeability, etc., shall be submitted to the executive secretary.*

### **INTERROGATORY STATEMENT:**

*Please revise the CQAP:*

- *To include an organization chart that has sufficient detail to show the lines of communication and authority.*
- *To include testing to demonstrate that the clay used for the bottom liner meets the  $1 \times 10^{-7}$  cm/s **field** hydraulic conductivity requirement. This can be done by using one of the following test methods (or an approved variation):*
  - *ASTM D5093-02 Standard Test Method for Field Measurement of Infiltration Rate Using a Double-Ring Infiltrometer with a Sealed-Inner Ring*

*If a variation of one of these methods or an alternate method is proposed (such as a single-ring infiltrometer), it needs to be submitted to the DRC for review and concurrence.*

### **BASIS FOR INTERROGATORY:**

*As stated in Round 1 Interrogatories, the applicant proposes to use a double liner with leak detection in order to prevent migration of wastes out of the impoundment (sections 4 & 5, TMP). The applicant indicates that the double liner with the leak detection system design is the Best Available Technology (BAT) and comparable to similar facilities in the industry. However, there*



*is insufficient information provided in the Construction Control Quality Assurance Plan (CCQAP) and only limited detailed plans and specifications are provided for the construction of Cell 1 and 2. The deficiencies in the CCQAP are addressed in this interrogatory, while the deficiencies in the plans and specifications are addressed in a separate interrogatory.*

*The review of the CCQAP and the responses to this interrogatory revealed a few items that were not clear. The CCQAP does include a description of the roles and responsibilities for the respective construction QA personnel. However, to ensure clarity on the lines of communication, and the level of independence provided by the QA organization proposed, an organization chart is needed that shows who reports to whom, and at what level. In addition, the CCQAP makes reference to the “Plans” and “Specifications” that have not been provided (addressed in Interrogatory 24/02). A review of CCQAP completeness cannot be performed without a completed set of these **Plans and Specifications**. The CCQAP, Plans, and Specifications are all complementary and integral in the implementation of the design.*

*The requirement for the hydraulic conductivity of the clay liner is an in place **field** hydraulic conductivity of  $1 \times 10^{-7}$  cm/s or less. This is considered BAT for liner systems (see reference Uranium One needs to provide a demonstration that the clay used for the bottom liner meets this requirement. In the response to this interrogatory in round 1, Uranium One stated that field permeability testing would prove too difficult, and preliminary laboratory testing indicated permeability's in the  $10^{-8}$  cm/sec range. Further justification is needed as to why field permeability testing has not been successfully completed, and as to the difficulty is performance of the testing.*

*According to “Assessment and Recommendations for Improving the Performance of Waste Containment Systems” (see reference for Bonaparte, Daniel, and Koerner, 2002 below), the most effective means of testing permeability of a soil layer such as a clay liner is in-place with a sealed double-ring infiltrometer. Another method used is a single-ring infiltrometer (see reference for Amoozegar and Warrick, 1989 below). However, since the single-ring infiltrometer is not as widely used or accepted as the double-ring method, the specific methods and procedure for the single-ring infiltrometer will need to be provided for DRC review and concurrence prior to its use. Of particular concern is the ability to test a large enough surface area of the clay liner that will provide reasonable results that represent the actual permeability of the clay layer. Field testing is used because it has been found that laboratory test methods are applied to a small and limited sample size (or area) that is not typically representative of the soil layer being evaluated. Extensive reviews of laboratory tests results (typically involving 75-mm-diameter samples of compacted clay materials) have shown a strong tendency to report smaller saturated conductivities for clay liners than are actually achieved in the field (Benson, Hardianto, and Motan 1994; Bonaparte, Daniel, and Koerner, 2002). For this reason the Division prefers the use of the field methods stated in the interrogatory.*

*The DRC believes that successful field permeability testing of the clay liner can be performed using “ASTM D5093-02 Standard Test Method for Field Measurement of Infiltration Rate Using a Double-Ring Infiltrimeter with a Sealed-Inner Ring. Another method can be used (such as a single-walled infiltrometer) provided the specific methods and procedures are provided for DRC review and concurrence.*

**REFERENCES:**

*Amoozegar, A, and A.W. Warrick. 1986. Hydraulic conductivity of saturated soils: field methods. American Society of Agronomy.*

*Bonaparte, Rudolph, David E. Daniel, and Robert M. Koerner, December 2002. Assessment and Recommendations for Improving the Performance of Waste Containment Systems. EPA/600/R-02/099.*

*Benson CH; Hardianto FS; and Motan ES, "Representative Specimen Size for Hydraulic Conductivity Assessment of Compacted Soil Liners," ASTM Specialty Technical Publication 23883S, January 1994.*

*Plateau Resources, Ltd., "Tailings Reclamation and Decommissioning Plan for Shootaring Canyon Uranium Project", Dated December, 2005.*

*Plateau Resources, Ltd., "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility" Amended December, 2005, Revised April 2007.*

*Plateau Resources, Ltd., Responses to Round 1 TMP Interrogatories, April 2007*

## **INTERROGATORY R313-24-4-20/02: LINER STRENGTH & COMPATIBILITY**

### **PRELIMINARY FINDING:**

*Refer to R313-24-4, 10 CFR 40 Appendix A(5)(a)(2)(a): The liner must be constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to pressure gradients (including static head and external hydrogeologic forces), physical contact with the waste or leachate to which they are exposed, climatic conditions, the stress of installation, and the stress of daily operation;*

*Refer to R317-6-1 (1.3): "Best Available Technology (BAT)" means the application of design, equipment, work practice, operation standard or combination thereof at a facility to effect the maximum reduction of a pollutant achievable by available processes and methods taking into account energy, public health, environmental and economic impacts and other costs;*

*Refer to R317-6-6 (6.4): ["ISSUANCE OF DISCHARGE PERMIT - The Executive Secretary, may issue a ground water discharge permit for a new facility if the Executive Secretary determines, after reviewing the information provided under R317-6-6.3, that: ...(A.3) the applicant is best available technology to minimize the discharge of any pollutant...";*

### **INTERROGATORY STATEMENT:**

*Please provide the following:*

- 1. An evaluation of the impact of stress imposed by equipment, tailings, and liquid during placement, as well as wind uplift on the liner system that could result in movement and degradation of the liner system, was not provided in response to this interrogatory. Descriptive and qualitative information was provided. Please include an evaluation of the steepest slope that will be subject to the highest stresses during construction as well as placement. Explain what is meant (specifically) when stating that the slopes will be "relatively mild". In addition, please note that since the "Reduced Moisture Tailings Placement (RMTP)" will be developed after the start of milling operations, and it is anticipated that the tailings will be placed in the cell via slurry, the statement that there will be no significant ponding of liquids against the exposed liner is not correct. Consider slurry and free liquids in the cell in the design and evaluating the stability of the liner system.*
- 2. An evaluation of the impacts of wind uplift forces and ballasting for wind uplift on the liner system while exposed to these forces.*
- 3. Please clarify that the anchor trench calculations utilize the most critical slope and loading conditions. Also, please justify the use of 32-degrees for the friction angle between the membrane and the sand when values from references are 18-degrees.*

### **BASIS FOR INTERROGATORY:**

*As stated in Round 1 Interrogatories, the Applicant's submission does not include sufficient information to allow a complete review of adequacy of the lining system design for meeting the requirements of 10 CFR 40, Appendix A, Criterion 5 A(2) which addresses cell liner*

requirements, or for meeting the criteria identified in R317-6-1, 1.3 for BAT, for double liner systems. Still lacking is a complete evaluation of the stresses on the liner system under maximum loading conditions. These maximum loading conditions need to be defined as the design basis, then calculations need to be developed and provided that demonstrate the liner system is capable of maintaining the design integrity, configuration, and performance. Reference is made to the RMTP as being an important basis of the design. However, the revised plan and responses to Round 1 Interrogatories state the tailings will also be placed as slurry, and it is inferred that the RMTP will be used when and if developed. A concise and well-defined design basis needs to be included that is then demonstrated to meet the respective criteria through technical evaluation, data, and calculations.

Clarification is needed on the anchor trench design calculations. Is the slope evaluated the most critical condition subject to the greatest loading (on imposing the greatest stress on the liner system)? The calculations state a conservative friction angle between the sand and membrane of 32-degrees, whereas Kroener sites a conservative value of 18-degrees. Using 18-degrees yields a longer pullout length than 32-degrees. Also, what is the soil that the trench is comprised of? It is not defined on Figure K-2. In addition, now that the tailings will be placed in the cells via a slurry, will this placement technique induce added loads to the liner? Should additional material be used in the discharge areas to handle this impact and loading (i.e., splash guards)?

#### **REFERENCES:**

Plateau Resources, Ltd., "Tailings Reclamation and Decommissioning Plan for Shootaring Canyon Uranium Project", Dated December, 2005.

Plateau Resources, Ltd., "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility" Amended December, 2005.

Valero, S.N., and Austin, D.N., 1999. "Simplified Design Charts for Geomembrane Cushions", in *Geosynthetics '99*, Boston, Mass. Available at:  
<http://www.sedimentremediation.com/TechRef/Dredge/GPD-SM-116.pdf>

Giroud, J.P., Gleason, M.H., and Zornberg, J.G., 1999. "Design of Geomembrane Anchorage Against Wind Action", in *Geosynthetics International*, Vol. 6, No. 6, 1999, pp. 481-507.

Hsuan, Y.G., Lord, A.E., and Koerner, R.M., 1991. "Effects of Outdoor Exposure on a High Density Polyethylene Geomembrane", in *Geosynthetics '91*, Atlanta, GA, pp. 287-302.

Koerner, R.M., Hsuan, Y.G., and Koerner, G.R., 2005. "Geomembrane Lifetime Prediction: Unexposed and Exposed Conditions", *Geosynthetic Institute White Paper #6*, June 7, 2005.

Plateau Resources, Ltd., "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility" Amended December, 2005, Revised April 2007.

Plateau Resources, Ltd., *Responses to Round 1 TMP Interrogatories*, April 2007

## **INTERROGATORY R313-24-4-21/02: LINER SETTLEMENT**

### **PRELIMINARY FINDING:**

*Refer to R313-24-4, 10 CFR 40 Appendix A(5)(a)(2)(b): The liner must be placed upon a foundation or base capable of providing support to the liner and resistance to pressure gradients above and below the liner to prevent failure of the liner due to settlement, compression, or uplift.*

### **INTERROGATORY STATEMENT:**

*Please indicate the extent of settlement, differential settlement, and distortion in the cover that are allowed at the time of final closure. Demonstrate that allowable settlement, differential settlement, and distortion resulting tailings consolidation with time will not damage the final liner system. Justify the respective design criteria and tailings material properties used.*

### **BASIS FOR INTERROGATORY:**

*In response to Round 1 Interrogatory Uranium One explained that the liner subgrade will be the Entrata Sandstone, and therefore settlement of the soil (rock) under the cells is not of concern. In addition, the clay and sand layers placed at part of the liner system will be compacted and also will not pose a concern with settlement. However, not provided is an evaluation and demonstration of the potential settlement of the tailings themselves after cover placement. This is now of particular concern considering that the tailings will be placed in a slurry with high liquid content. Will any anticipated settlement from dewatering of the tailings via the leachate collection system (including differential settlement) impact the integrity of the cover system? How long before dewatering is complete and consolidation of the tailings is no longer of concern? What are the settlement tolerances of the cover system? The moisture content, and other physical properties of the tailings after cover placement, and their potential for consolidation, thereby impacting the cover needs to be considered in this evaluation.*

### **REFERENCES:**

*Plateau Resources, Ltd., "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility" Amended December, 2005.*

*Plateau Resources, Ltd., "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility" Amended December, 2005, Revised April 2007.*

*Plateau Resources, Ltd., Responses to Round 1 TMP Interrogatories, April 2007*

## **INTERROGATORY R313-24-4-22/02: LEACHATE COLLECTION AND DETECTION SYSTEM DESIGN**

### **PRELIMINARY FINDINGS:**

*Refer to R313-24-4(2)(J)(ii): Clarifications or Exceptions. "Utah Administrative Code, Rule R317-6, Ground Water Quality Protection" for ground water standards in "Environmental Protection Agency in 40 CFR part 192, subparts D and E" as found in the Introduction, paragraph 4; or "Environmental Protection Agency in 40 CFR part 192, subparts D and E (48 FR 45926; October 7, 1983)" as found in Criterion 5;*

*Refer to R317-6-1 (1.3): "Best Available Technology (BAT)" means the application of design, equipment, work practice, operation standard or combination thereof at a facility to effect the maximum reduction of a pollutant achievable by available processes and methods taking into account energy, public health, environmental and economic impacts and other costs.*

*Refer to R317-6-6 (6.4): ["ISSUANCE OF DISCHARGE PERMIT - The Executive Secretary, may issue a ground water discharge permit for a new facility if the Executive Secretary determines, after reviewing the information provided under R317-6-6.3, that: ... (A.3) the applicant is best available technology to minimize the discharge of any pollutant..."]*

*Refer to Refer to 10 CFR Part 40 Appendix A, Criterion 5 (A)(4): ... " a surface impoundment must be designed, constructed, maintained, and operated to prevent overtopping resulting from normal or abnormal operations, overfilling, wind and wave actions, rainfall, or run-on; from malfunctions of level controllers, alarms, and other equipment; and from human error..."*

### **INTERROGATORY STATEMENT:**

*Please provide additional information to demonstrate that:*

- 1. The description of the drainage sock application represented in Figure 5-9 so that it adequately address the issues raised in Round 1 Interrogatory. The outstanding issues are as follows:*
  - Provide discussion on the function of the fabric in Figure 5-8 (if it is different from the assumed purpose).*
  - Explain why the fabric is not necessary in Figure 5-9.*
  - Revise Figure 5-9 to indicate that the application illustrated is only to be used on steep slopes where the drainage layer is not present.*
  - Correct contradiction between Figure 5-9 (that illustrates a drainage layer similar to that of Figure 5-8) and its supporting the text (that indicates that a drainage layer is not present in the application).*
- 2. Entrada Sands appear to have  $D_{15\text{filter}}$  values that are close, but smaller than the limit allowed by the National Engineering Handbook, "Gradation Design of Sand and Gravel Filters". Please provide additional justification for the selection of the Entrada sand*



*material or provide an additional reference that allows grain sizes that are smaller than those specified in the Handbook.*

#### **BASIS FOR INTERROGATORY:**

*BAT requires that leachate collection and detection systems be designed to resist clogging during the active life and post-closure period. The proper design of the Sand/Tailings interface is a critical point where, under the current design, clogging potential is viewed as the highest.*

*With regard to the use of the geotextile filter illustrated in Figure 5-8, we recognize that this application likely represents the Best Available Technology for use of a geotextile for filtration.*

*The drainage sock application represented in Figure 5-9, however, does not fully satisfy the issues raised in Interrogatory 1. The outstanding issues are as follows:*

- *There is no separation/filtration fabric shown between either the Entrada sand or the sand and gravel drainage layer and the washed gravel envelope. This fabric is included in Figure 5-8, however, and is assumed to function both as a separation between the poorly-graded washed gravel and the well-graded filter soils. A discussion on the function of the fabric in Figure 5-8 is needed.*
- *Figure 5-9 does not indicate the limited use of the application illustrated. Please revise the figure to indicate that the application illustrated is only to be used on steep slopes where the drainage layer is not present. Also, the figure illustrates a drainage layer similar to the Figure 5-8 application, but the text indicates that a drainage layer is not present in the Figure 5-9 application. Include a discussion on why the separation/filtration fabric is not necessary in the Figure 5-9 application.*
- *Referring to Chapter 26 of the National Engineering Handbook, “Gradation Design of Sand and Gravel Filters”, we recognize that the use of part 633.2603, “Determining filter gradation limits” is appropriate. Table 26-2 provides maximum  $D_{15\text{filter}}$  values (category 1) as less than or equal to  $9 \times d_{85\text{soil}}$ , and provides a minimum  $D_{15\text{filter}}$  value of 0.2mm (not consistent with Entrada Sand). However, Table 26-3 allows for a small  $D_{15\text{filter}}$  value when considering permeability criteria ( $D_{15\text{filter}}$  greater than or equal to 0.1mm). That being said, Entrada Sands appear to have  $D_{15\text{filter}}$  values that are close, but smaller than the limit allowed by the Handbook. Please provide additional justification for the selection of this material or provide an additional reference that allows grain sizes that are smaller than those specified in the Handbook.*

#### **REFERENCES:**

*Plateau Resources, Ltd., “Tailings Reclamation and Decommissioning Plan for Shootaring Canyon Uranium Project”, Dated December, 2005.*

*Plateau Resources, Ltd., “Tailings Management Plan for Shootaring Canyon Uranium Processing Facility” Amended December, 2005.*

*Koerner, G.R, Koerner, R.M., and Martin, J.P. 1993. “Field Performance of Leachate Collection Systems and Design Implications”. Solid Waste Association of North America: 31<sup>st</sup> Annual International Solid Waste Exposition, pp. 365-380.*

*Reinhart, D.R. et al. 1998. Assessment of Leachate Collection System Clogging at Florida Municipal Landfills. Report # 98-5. Florida Center for Solid and Hazardous Waste Management, Gainesville, FL. October 30, 1998.*

*Rowe, R.K. 2005. Long Term Performance of Containment Barrier Systems, Geotechnique, 55, No. 9, pp. 631-678.*

*R313-24. Uranium Mills and Source Material Mill Tailings Disposal Facility Requirements.*

*R317-6. Ground Water Quality Protection.*

*10 CFR Part 40. Domestic Licensing of Source Materials.*

*Title 40, Chapter 1, Part 264, Subpart K, Sec 264.221*

*Plateau Resources, Ltd., "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility" Amended December, 2005, Revised April 2007.*

*Plateau Resources, Ltd., Responses to Round 1 TMP Interrogatories, April 2007*



## **INTERROGATORY R313-24-4-23/02: DIKE INTEGRITY**

### **PRELIMINARY FINDING:**

*Refer to R313-24-4, 10 CFR 40 Appendix A(5)(a)(5): When dikes are used to form the surface impoundment, the dikes must be designed, constructed, and maintained with sufficient structural integrity to prevent massive failure of the dikes. In ensuring structural integrity, it must not be presumed that the liner system will function without leakage during the active life of the impoundment.*

### **INTERROGATORY STATEMENT:**

*Please confirm that all critical slopes have been evaluated or are represented by the evaluation of the most critical slope. Provide such analyses for the Division's review. These analyses must include and/or consider the dikes between Cell 1 and Cell 2 and between Cell 1 and the Evaporation and Process Pond Cell (EPPC) and the conditions where the liner is assumed to have failed (e.g., worst case scenario).*

*Please provide a slope and seismic stability evaluation for Shootaring Canyon Dam, the Cross Valley Berm, the area between the Cell 1 and the EPPC, and any other dams/berms using a failed liner condition under a worst case scenario or similar.*

*Provide conclusive calculations, models, and statements demonstrating the applicability and adequacy of the existing or new slope stability analysis. Ensure that such calculations, models, and statements address all special conditions that would affect dike and liner system integrity that may exist between Cell 1 and Cell 2 and between Cell 1 and the EPPC.*

### **BASIS FOR INTERROGATORY:**

*In general, the response and revised text in Section 3 address part of the interrogatory statement from Round 1. Another analysis of seismic stability was conducted by Inberg-Miller Engineers [IME] (dated January 2007) with a Safety Factor of 1.18. However, this did not constitute a worst case scenario with a failed liner and leakage as required by Utah Administrative Code and URCR. The new analysis from IME 'assumed no phreatic surface will develop through the earthen dam.' The UDRC rule reads, 'In ensuring structural integrity, it must not be presumed that the liner system will function without leakage during the active life of the impoundment' R313-24-4.*

*Seismic and slope stability analyses were conducted by the applicant for the Shootaring Canyon Dam and the Cross Valley Berm (section 3 & Appendix A, TMP). The reference documents within the application do not address piping, however this may not be wholly applicable since the cells have double layers (liners) technology. The documents do contain a slope stability analysis for the Cross Valley Berm.*

*The information requested is needed to demonstrate the long-term stability of the final cover, especially in consideration of the cited passage of URCR on the presumption of leakage of the liner system during the active life of the impoundment.*

**REFERENCES:**

*Plateau Resources, Ltd., “Tailings Management Plan for Shootaring Canyon Uranium Processing Facility,” Dated December 2005, Revised April 2007.*

*Plateau Resources, Ltd., “Tailings Reclamation and Decommissioning Plan for Shootaring Canyon Uranium Project”, Dated December, 2005.*

*Plateau Resources, Ltd., “Tailings Management Plan for Shootaring Canyon Uranium Processing Facility” Amended December, 2005.*

## **INTERROGATORY R313-24-4-24/02: BEST AVAILABLE TECHNOLOGY**

### **PRELIMINARY FINDING:**

*Refer to R313-24-4, R317-6-1 (1.3): "Best Available Technology (BAT)" means the application of design, equipment, work practice, operation standard or combination thereof at a facility to effect the maximum reduction of a pollutant achievable by available processes and methods taking into account energy, public health, environmental and economic impacts and other costs.*

*Refer to R317-6-6 (6.4): [“ISSUANCE OF DISCHARGE PERMIT - The Executive Secretary, may issue a ground water discharge permit for a new facility if the Executive Secretary determines, after reviewing the information provided under R317-6-6.3, that: ...(A.3) the applicant is best available technology to minimize the discharge of any pollutant...”].*

### **INTERROGATORY STATEMENT:**

*Please provide the following:*

- 1. Estimation of anticipated leachate flow rates and maximum capacity in the leachate collection systems.*
- 2. Complete Liner system design and construction drawings (plans) , as well as material and performance specifications. They are to be certified by a Professional Engineer licensed in the State of Utah, and shall include, but not be limited to, cell liner, leachate collection, leak detection, dewatering operations, tailings transfer and management, and storm water control layouts, cross sections, details, and profiles. They must include proposed elevations and horizontal coordinates at all key locations. The specifications must cover (but not limited to) all proposed components and materials, their respective material and equipment and installation requirements.*
- 3. An estimate of volumes and capacities of the cells as well as cut and fill quantities.*
- 4. The adequacy of the HDPE pipe buried at depths of up to 128 feet requires additional consideration. Refer to the discussion in the Basis of Interrogatory.*

### **BASIS FOR INTERROGATORY:**

*Review of the responses to the response to Round 1 Interrogatory found that the following concerns remain:*

- 1. Estimation of anticipated leachate flow rates and maximum capacity in the leachate collection systems has not been identified in the submittal and must be provided. Estimation of the anticipated flows will enable the leachate management system to be properly designed to accommodate the full flow conditions and will ensure that the tailings are dewatered in a reasonable timeframe. This estimation should then also be included as part of the Leachate Monitoring, Operations, Maintenance, and Reporting Plan.*
- 2. The liner system design and construction drawings and material and performance specifications need to be developed. These items are currently only addressed for the*

*cover system, but are not included for the liner system. Provide drawings (plans) and specifications in sufficient detail so they could essentially be used for bidding and construction. They are to be certified by a Professional Engineer licensed in the State of Utah. The drawings shall include, but not be limited to, cell liner, leachate collection, leak detection, dewatering operations, tailings transfer and management, and storm water control layouts, cross sections, details, and profiles. They shall include proposed elevations and horizontal coordinates at all key locations. The specifications shall cover (but not limited to) all proposed components and materials, their respective material and equipment and installation requirements*

*In addition, design exercises such as estimating volumes and capacities and creating filling and grading plans in advance of waste generation are critical to a successful project since these exercises help to ensure that estimated volumes are considered and that adequate storage space is planned (even if the storage is temporary). It is common practice to prepare for the estimated contaminated soil volume with a contingency volume included (contingency amount would be based on the confidence in the primary volume estimate). If the contingency volume is not used, then clean or lower level contaminated material can be placed as general fill. These concepts would all be blended into the detailed design drawings and specifications.*

- 3. The adequacy of the HDPE pipe buried at depths of up to 128 feet requires additional consideration. Various material vendors produce tables of recommended maximum cover depths that contain maximum depth values far less than those specified in the design (ADS-pipe.com, for example). The ADS-pipe.com website contains in it's Technical Note TN2.01, April 2007, "Minimum and Maximum Burial Depth for Corrugated HDPE Pipe", a maximum burial depth for 4 inch HDPE pipe of 44 feet (class I backfill). In addition, the American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design (LRFD) Bridge Design Specifications Section 12 - "Buried Structures and Tunnel Liners" presents a process for evaluation of pipe strength compared to burial depth. This procedure suggests that the pipe under consideration in place, may be subject to forces in excess of those needed for prevention of crushing. Further review and consideration of this pipe evaluation procedure is necessary.*

#### **REFERENCES:**

*Plateau Resources, Ltd., "Tailings Reclamation and Decommissioning Plan for Shootaring Canyon Uranium Project", Dated December, 2005.*

*Plateau Resources, Ltd., "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility" Amended December, 2005.*

*Plateau Resources, Ltd., "Shootaring Canyon Uranium Processing Facility Environmental Report, Source Material License No. UT0900480", Dated January 2006.*

*Plateau Resources, Ltd., "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility" Amended December, 2005, Revised April 2007.*

*Plateau Resources, Ltd., Responses to Round 1 TMP Interrogatories, April 2007*

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## **INTERROGATORY R313-24-4-26/02: INFILTRATION AND CONTAMINANT TRANSPORT MODELING**

### **PRELIMINARY FINDINGS:**

*Refer to R313-24-4(2)(J)(ii): Clarifications or Exceptions. "Utah Administrative Code, Rule R317-6, Ground Water Quality Protection" for ground water standards in "Environmental Protection Agency in 40 CFR part 192, subparts D and E" as found in the Introduction, paragraph 4; or "Environmental Protection Agency in 40 CFR part 192, subparts D and E (48 FR 45926; October 7, 1983)" as found in Criterion 5;*

*Refer to R317-6-1 (1.3): "Best Available Technology" means the application of design, equipment, work practice, operation standard or combination thereof at a facility to effect the maximum reduction of a pollutant achievable by available processes and methods taking into account energy, public health, environmental and economic impacts and other costs.*

*Refer to R317-6-6.3: [ "APPLICATION REQUIREMENTS FOR A GROUND WATER DISCHARGE PERMIT - Unless otherwise determined by the Executive Secretary, the application for a permit to discharge wastes or pollutants to ground water shall include the following complete information: (G) Information which shows that the discharge can be controlled and will not migrate into or adversely affect the quality of any other waters of the state, including the applicable surface water quality standards, that the discharge is compatible with the receiving ground water, and that the discharge will comply with the applicable class TDS limits, ground water quality standards, class protection levels or an alternate concentration limit proposed by the facility".*

*Refer to 10 CFR, Part 40, Appendix A, Criterion 6(1), which requires that the impoundment design "provide reasonable assurance of control of radiological hazards to be effective for 1,000 years to the extent reasonably achievable, and in any case, for at least 200 years".*

### **INTERROGATORY STATEMENT:**

*Please provide sufficient information to demonstrate that the cover system will not experience some potential long-term degradation through one or more processes (as discussed below in the Basis For Interrogatory), when active institutional control is no longer in effect to maintain the cover system.*

*Provide additional information to identify and evaluate the potential effects of long-term degradation processes on the components of the final cover system.*

*Conduct and report additional (infiltration sensitivity) analyses to assess the potential affects of such cover system component degradation on long –term infiltration rates through the cover during the cover’s design life.*

### **BASIS FOR INTERROGATORY:**

*The response does not provide sufficient information to support the contention that the compacted clay layer in the cover system (and/or other layers in the cover system as well) would not experience some potential long-term degradation through one or more processes, under the scenario where there the active institutional controls period is no longer in effect to maintain the*

cover system. Additional information should be provided to identify and evaluate the potential effects of long-term degradation processes on the compacted clay layer and on other components of the final cover system. Additional (infiltration sensitivity) analyses should be conducted and modeling results from such analyses provided to assess the potential effects of such cover system component degradation on long-term infiltration rates through the cover during the cover's design life. Specific information that should be considered includes the following:

- Additional information demonstrating that analyses of the closed facility's future performance have considered reasonably foreseeable degraded conditions that could occur within the final cover system after closure (e.g., up to several hundred years following closure) if the closed site were not actively maintained. For example, in the HELP Modeling simulations described in the December 2006 Tailings Reclamation Plan, it is not clear that the HELP Model simulations provided incorporate any reduction in the value of saturated hydraulic conductivity for either the fine sand layer or for the rock mulch capping layer to reflect potential (e.g., partial) clogging of these layers with windblown fines (rock mulch layer) or fines (sand drainage layer) that could invade these layers over time through ecological succession, or an increased value of saturated hydraulic conductivity of the radon barrier layer due to the effects of (e.g., moderately deep or possibly deeper-rooted) plant species. Other cover system physical parameters that could be affected over the long term due to environmental processes, such as porosity, field capacity, and wilting point of various cover layers, should be considered and incorporated as appropriate, into the infiltration analysis.
- A bioinvasion assessment/analysis, including information regarding the potential for shallow and/or possibly deeper-rooted plant species to become established on the final cover system and an analysis to evaluate the effects of such vegetation on long-term infiltration rates. For example, it has not been demonstrated whether or not it is possible that native vegetation, including one or more deep-rooted species (such as black greasewood in particular, or other deeper-rooted species that might be present in Shootaring Canyon area) might become established on areas of the cover after the 100-year period of institutional control.
- If the information compiled above indicates that establishment of moderately deep to deeper-rooted vegetation on the final cover system appears possible, please provide a sensitivity analysis in the HELP model to evaluate the effect of such deeper-rooted species becoming established on the final cover during the performance period on long-term infiltration rates through the cover. Phenomena to consider include a network of taproot/possible root decay-induced defects in the radon barrier layer and their effect on hydraulic conductivity of the radon barrier layer.
- A revised infiltration analysis that considers the potential for partial degradation of the 40-mil HDPE geomembrane, as a result of puncturing damage or other construction-related or post-construction static loading-related damage, if considered possible, as well as long-term deterioration of the HDPE geomembrane liner due to antioxidant depletion, oxidative induction (with resulting HDPE embrittlement and chain scission and environmental stress cracking), and other possible factors (e.g., biological agents).



- *The possibility of stress cracking with the HDPE geomembrane has not been addressed in the HELP model. Information addressing the issue of potential stress cracking in the geomembrane and its effects on cover infiltration needs to be provided.*
- *A frost depth analysis should be performed to determine the maximum projected frost penetration depth within the final cover.*

#### **REFERENCES:**

*Badu-Tweneboah, K., Tisinger, L.G., Giroud, J.P., and Smith, B.S., 1999, "Assessment of the Long-Term Performance of Polyethylene Geomembrane and Containers in a Low-Level Radioactive Waste Disposal Landfill," in Proceedings, Geosynthetics '99, Boston, Massachusetts, April 28-30, 1999.*

*DOE 2001. Disposal Cell Cover Moisture Content and Hydraulic Conductivity, Long-Term Surveillance and Maintenance Program Shiprock, New Mexico, Site, Grand Junction, Colorado. May 2001.*

*EPA 2002a. "Simulating Radionuclide Fate and Transport in the Unsaturated Zone: Evaluation and Sensitivity Analyses of Select Computer Models". EPA/600/R-02/082. 2002.*

*EPA 2002b. U.S. Environmental Protection Agency 2002. Assessment and Recommendations for Improving the Performance of Waste Containment Systems. EPA/600/R-02/099. Cincinnati, Ohio. December 2002.*

*EPA 2004. "Technical Guidance for RCRA/CERCLA Final Covers", USEPA - USACE Superfund Partnership Program Policy, Guidance, and Activities, Chapter 2 and Appendix B. <http://hq.environmental.usace.army.mil/epasuperfund/geotech/>*

*Hydro-Engineering, L.L.C. 2006. Ground-Water Monitoring of Shootaring Canyon Tailings Site - 2005.*

*Koerner et al. 2005. Koerner, R, Hsuan, Y.G., and Koerner, G. 2005. GRI White Paper #6 - on -Geomembrane Lifetime Prediction: Unexposed and Exposed Conditions. Geosynthetic Institute, Folsom, Pennsylvania. June 7, 2005.*

*National Committee on Radiation Protection, National Bureau of Standards(NBS) Handbook 69 (1959), "Maximum Permissible Body Burdens and Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure," Superintendent of Documents, U.S. Department of Commerce, U.S. Government Printing Office, Washington, D.C., June 5, 1959.*

*Plateau Resources, Ltd., "Revised Tailings Reclamation and Decommissioning Plan for Shootaring Canyon Uranium Project", Dated December 2006.*

*Plateau Resources, Ltd., "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility" Amended December, 2005, Revised April 2007.*

*Plateau Resources, Ltd., Responses to Round 1 TMP Interrogatories, April 2007*

## **INTERROGATORY R317-6-2.1-27/02: GROUNDWATER MONITORING**

### **PRELIMINARY FINDING:**

*Refer to R317-6-2.1: The Ground Water Quality Standards (GWQSs) as listed in Table 1 are adopted for protection of ground water quality (refer to Table 1 in the standard), however, this list is not required for analysis per the current January 2004 GWQDP.*

*Refer to R317-6-6.3.I: [“APPLICATION REQUIREMENTS FOR A GROUND WATER DISCHARGE PERMIT - Unless otherwise determined by the Executive Secretary, the application for a permit to discharge wastes or pollutants to ground water shall include the following complete information: (I) A proposed sampling and analysis monitoring plan which conforms to EPA Guidance for Quality Assurance Project Plans, EPA QA (EPA/600/R-98/018, February 1998) and includes the following...1. ground-water monitoring to determine ground water flow direction and gradient, background quality at the site, and the quality of groundwater at the compliance monitoring point...”*

### **INTERROGATORY STATEMENT:**

- 1. Please provide a proposed sampling and analysis plan for monitoring of the seep (or spring) located south of the mill site near Ant Knolls (as shown on Figure 1-1 of the revised Tailings Management Plan). Please also provide information to indicate whether sampling and analysis of springs or seeps located northwest of the mill site and proposed cells 1 and 2 and the spring or seep located northeast of proposed Cells 1 and 2 (e.g. Lost Spring) would be conducted, for example, for comparison purposes. Alternatively, please provide justification for not monitoring these seep/spring locations.*
- 2. Please confirm the location of the point of compliance groundwater monitoring wells.*
- 3. Please provide rationale for selecting parameters for groundwater sampling and analysis (as listed in Section 7 and in Appendix D of the Revised Tailings Management Plan (Plateau Resources, Ltd. And Hydro-Engineering, LLC 2007), including parameters to be used as key indicators of performance. Please provide additional information/rationale to support not specifying requirements for analysis of any parameters (e.g., Radium-228 and gross alpha) identified in R317-6-2.1, as applicable parameters for sampling and analysis.*
- 4. Please discuss how it will be ensured that monitored parameters would not exceed the Groundwater quality Standards listed Table 1 in R317-6-2.1. Please include information to address the potential for selenium exceedances and the potential applicability of the revised arsenic water quality standard which became enforceable in January of 2006.*
- 5. Please provide a proposal detailing the proposed methodology for establishing background groundwater quality for the proposed facility and site. Please provide as part of that methodology information regarding statistical approaches to be used for:*
  - Determining background groundwater quality characteristics and (background) groundwater quality compliance limits.*



- *Determining the occurrence of statistically significant temporal trends in groundwater quality at the compliance monitoring wells.*

**BASIS FOR INTERROGATORY:**

*The basis for the above Interrogatory includes information contained in the Basis for Interrogatory that was provided in the Round 1 Interrogatories, which, for convenience, is repeated below:*

*“A complete and concise plan that includes the details of the proposed groundwater monitoring to be done at the site is needed. It should include rationale for monitoring locations, frequency, parameters, sampling and analysis methodology, evaluation of results, reporting and documentation, and parameters limits.*

*Information needs to be provided detailing the statistical methods that will be used for establishing background water quality limits and for determining statistically significant trends in groundwater quality. NRC 2003, Section 4.2.3, and American Society for Testing and Materials Standard D 6312, provide guidelines regarding statistical analysis methods that can be used for determining background concentrations for constituents of concern and for evaluating potential groundwater quality trends.*

*Data reported in the “Ground-Water Monitoring Report of Shootaring Canyon Tailings Site – (Hydro-Engineering, L.L.C., February 2006) indicate selenium concentrations in water from Well RM 20 that exceed the currently-specified selenium threshold value (0.022 mg/L). If the licensee desires to have alternate concentration limits included in the GWQDP, as proposed in the 2005 Ground Water Monitoring Report, then the licensee should provide the data and associated analysis including a clear statistical basis for the proposed alternate concentration limits. Also, please clearly state the methodology and statistical basis that will be used to determine the (background) selenium concentration limit.*

*Uranium One must demonstrate that the GWQs are not exceeded per R317-6-2.1. This should be demonstrated via sampling and analysis and background determination of the constituents in Table 1 in R317-6-2.1 as appropriate. The GWQDP does not currently specify the requirement for analysis of Radium-228 and gross alpha per R317-6-2.1.”*

**REFERENCES:**

*ASTM D 6312. “Standard Guide for Developing Appropriate Statistical Approaches for Ground-Water Detection Monitoring Programs”. ASTM, West Conshohocken, PA.*

*Hydro-Engineering, LLC. Ground Water Monitoring of Shootaring Canyon Tailings Site – 2005. February 2006.*

*NRC 2003. NUREG-1620, Rev. 1, “Standard Review Plan for the Review of a Reclamation Plan for Mill Tailings Sites Under Title II of the Uranium Mill Tailings Radiation Control Act of 1978.” Washington, DC: NRC 2003.*

*Utah Department of Environmental Quality. Ground Water Quality Discharge Permit. Permit #UGW170003, issued January 14, 2004.*

*Utah Department of Environmental Quality. Division of Radiation Control. Radioactive Material License UT 0900480, Amendment # 2.*

*Plateau Resources, Ltd., "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility" Amended December, 2005, Revised April 2007.*

*Plateau Resources, Ltd., Responses to Round 1 TMP Interrogatories, April 2007*

## **INTERROGATORY R317-6-6.3F-28/02: INFORMATION ON EFFLUENT DISCHARGE RATES**

### **PRELIMINARY FINDING:**

*Refer to R317-6-6.3F: Unless otherwise determined by the Executive Secretary, the application for a permit to discharge wastes or pollutants to ground water shall include the following complete information:*

*F. The type, source, and chemical, physical, radiological, and toxic characteristics of the effluent or leachate to be discharged; the average and maximum daily amount of effluent or leachate discharged (gpd), the discharge rate (gpm), and the expected concentrations of any pollutant (mg/l) in each discharge or combination of discharges. If more than one discharge point is used, information for each point must be given separately.*

### **INTERROGATORY STATEMENT:**

*Estimate the leakage through the secondary liner in similar fashion to the method used to calculate leakage through the primary liner (Section 5.1.4.7 of the TMP). Prepare the estimate using assumptions of head based on the intended operating conditions within the secondary containment sumps (i.e., head caused by one day of leakage and reasonable assumptions as to the leakage through the liner into the underlying subgrade. State and justify the estimated discharge quality and quantity. State the estimated leakage rate for each of the areas, recognizing that the impoundments each will be lined with secondary containment, and that the ore pad will allow greater leakage through the clay liner*

*Please provide the maximum daily leachate (gpd) and discharge rate (gpm) in each discharge or combination of discharges. Include in this information any discharge that may result from leakage through the tailings cells liner systems, the ore pad liner, and the Evaporation and Process Pond Cell. Please provide the appropriate calculations for each discharge. Also, please state the expected concentrations of pollutants in each discharge and the basis for the determination.*

### **BASIS FOR INTERROGATORY:**

*Uranium One must provide the above requested information on all discharges of pollutants that impact or have the potential to impact ground water. This information must include all discharges or potential discharges associated with effluent discharge, storage, and liner systems.*

### **REFERENCES:**

*Plateau Resources, Ltd., "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility" Amended December, 2005.*

*Plateau Resources, Ltd., "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility" Amended December, 2005, Revised April 2007.*

*Plateau Resources, Ltd., Responses to Round 1 TMP Interrogatories, April 2007*

## **INTERROGATORY PR R317-6-6.3G-29/02: SURFACE WATER CONTROLS**

### **PRELIMINARY FINDING:**

*Refer to R317-6-6.3G: Unless otherwise determined by the Executive Secretary, the application for a permit to discharge wastes or pollutants to ground water shall include the following complete information:*

*G. Information which shows that the discharge can be controlled and will not migrate into or adversely affect the quality of any other waters of the state, including the applicable surface water quality standards, that the discharge is compatible with the receiving ground water, and that the discharge will comply with the applicable class TDS limits, ground water quality standards, class protection levels or an alternate concentration limit proposed by the facility.*

### **INTERROGATORY STATEMENT:**

*Please provide information on how surface water run-on and run-off controls will be applied to control the migration of contaminants from the site and associated operations. This is to include a hydraulic analysis for surface water flow and control that could impact the site during milling operations. The analysis needs to be the same level of detail as provided for the Tailings Reclamation and Decommissioning Plan (Section 6.3), and include:*

- *How (specifically) surface water flow from contaminated areas will be handled separately from surface water from non-contaminated areas.*
- *How impounded water will not alter or compromise the groundwater flow directions in the Upper Entrada Aquifer.*
- *Layout of flow patterns for surface water controls*
- *Design and details of surface water control structures and respective flow rates*
- *Design basis*
- *Operation and maintenance involved*

*Please justify statements that infer that no storm water will impact “waters of the State” in consideration that surface water will be impounded and has the potential to impact groundwater. This justification could be combined with a response to Interrogatory 28/02.*

### **BASIS FOR INTERROGATORY:**

*Uranium One’s response to Round 1 Interrogatory referred to Section 5.1.6 of the TMP that includes a limited summary of the surface water controls to be implemented during operation. No detailed information on the design and sizing of these controls was included, nor were there details on how water from contaminated areas will be kept and handled separately from water from non-contaminated areas. The same type of hydraulic analysis that was done for the Tailings Reclamation and Decommissioning Plan for storm water control after cell closure (Section 6.3) needs to be performed for the storm water control during mill operation.*

*In addition, the statement is made that no storm water will leave the site as surface discharge. However, water will be impounded and could be discharged to groundwater (see Interrogatory 28/02). According to R313-6-6.3G, the operator is required to determine that discharges will not affect “waters of the State” which includes groundwater.*

**REFERENCES:**

*Plateau Resources, Ltd., “Tailings Management Plan for Shootaring Canyon Uranium Processing Facility” Amended December, 2005.*

*Plateau Resources, Ltd., “Tailings Management Plan for Shootaring Canyon Uranium Processing Facility” Amended December, 2005, Revised April 2007.*

*Plateau Resources, Ltd., Responses to Round 1 TMP Interrogatories, April 2007*

## **INTERROGATORY R313-24-4-30/02: GEOLOGIC, HYDROLOGIC, AND AGRICULTURAL DESCRIPTION**

### **PRELIMINARY FINDINGS:**

*Refer to R313-24-4(2)(J)(ii): "Utah Administrative Code, Rule R317-6, Ground Water Quality Protection" for ground water standards in "Environmental Protection Agency in 40 CFR part 192, subparts D and E" as found in the Introduction, paragraph 4; or "Environmental Protection Agency in 40 CFR part 192, subparts D and E (48 FR 45926; October 7, 1983)" as found in Criterion 5;*

*Refer to R317-6-6.3: ["Application Requirements For A Ground Water Discharge Permit - Unless otherwise determined by the Executive Secretary, the application for a permit to discharge wastes or pollutants to ground water shall include the following complete information...: D. A plat map showing all water wells, including the status and use of each well, Drinking Water source protection zones, topography, springs, water bodies, drainages, and man-made structures within a one-mile radius of the discharge. The plat map must also show the location and depth of existing or proposed wells to be used for monitoring ground water quality. Identify any applicable Drinking Water source protection ordinances and their impacts on the proposed permit;]*

*Refer to R317-6-6.3: ["Application Requirements For A Ground Water Discharge Permit - Unless otherwise determined by the Executive Secretary, the application for a permit to discharge wastes or pollutants to ground water shall include the following complete information... E. Geologic, hydrologic, and agricultural description of the geographic area within a one-mile radius of the point of discharge, including soil types, aquifers, ground water flow direction, ground water quality, aquifer material, and well logs."]*

### **INTERROGATORY STATEMENT:**

*Please state the status of each well and seep shown in Figure 7-1 of the TRDP. Tie Figure 7-1 into the local survey plat. Include in Figure 7-1 information about the area within a one mile radius of the discharge point or within one mile of the perimeter of the tailing ponds. Include true and magnetic north, with declination and date of declination measurement. Refer to the preliminary findings stated above to ensure the Uranium One provides complete details that should be included in the plat. If a specific item from the preliminary findings is not applicable, clearly state this in both the response and text accompanying the revised Figure 7-1.*

### **BASIS FOR INTERROGATORY:**

*Figure 7-1, as provided contained in the TRDP revised December 2006, does not meet the June 2006 interrogatory request (repeated below for convenience).*

*"Please provide, in a readily accessible format, the hydrologic information specified under the stated requirements. Please also provide a current plat map showing all existing water wells, including the status and use of each well, Drinking Water source protection zones, topography, springs, water bodies, drainages, and man-made structures*

*within a one-mile radius of the discharge (or other information demonstrating that such features do not exist).”*

**REFERENCES:**

*Plateau Resources, Ltd., “Tailings Reclamation and Decommissioning Plan for Shootaring Canyon Uranium Project – 2005; Garfield County, Utah”, Dated December 2005, revised December 2006.*

*Plateau Resources, Ltd., “Tailings Reclamation and Decommissioning Plan for Shootaring Canyon Uranium Project”, Dated December, 2005.*

*Plateau Resources, Ltd., “Tailings Management Plan for Shootaring Canyon Uranium Processing Facility” Amended December, 2005.*

*Plateau Resources, Ltd., “Shootaring Canyon Uranium Processing Facility Environmental Report, Source Material License No. UT0900480”, Dated January 2006.*



## **INTERROGATORY R313-24-4-33/02: POST-CLOSURE DRAINAGE AND EROSION CONTROLS AND POSTCLOSURE MAINTENANCE**

### **PRELIMINARY FINDING:**

*Refer to R313-24-4 (10 CFR 40, Appendix A, Criterion 6 (1), (7)): In disposing of waste byproduct material, licensees shall place an earthen cover (or approved alternative) over tailings or wastes at the end of milling operations and shall close the waste disposal area in accordance with a design which provides reasonable assurance of control of radiological hazards to (i) be effective for 1,000 years, to the extent reasonably achievable, and, in any case, for at least 200 years, and (ii) limit releases of radon-222 from uranium byproduct materials, and radon-220 from thorium byproduct materials, to the atmosphere so as not to exceed an average release rate of 20 picocuries per square meter per second (pCi/m<sup>2</sup>s) to the extent practicable throughout the effective design life determined pursuant to (1)(i) of this Criterion. In computing required tailings cover thicknesses, moisture in soils in excess of amounts found normally in similar soils in similar circumstances may not be considered. Direct gamma exposure from the tailings or wastes should be reduced to background levels. The effects of any thin synthetic layer may not be taken into account in determining the calculated radon exhalation level. If non-soil materials are proposed as cover materials, it must be demonstrated that these materials will not crack or degrade by differential settlement, weathering, or other mechanism, over long-term intervals.*

*Refer to R313-24-4 (10 CFR 40, Appendix A, Criterion 6 (7)): The licensee shall also address the nonradiological hazards associated with the wastes in planning and implementing closure. The licensee shall ensure that disposal areas are closed in a manner that minimizes the need for further maintenance. To the extent necessary to prevent threats to human health and the environment, the licensee shall control, minimize, or eliminate post-closure escape of nonradiological hazardous constituents, leachate, contaminated rainwater, or waste decomposition products to the ground or surface waters or to the atmosphere.*

*Refer to R317-6-6.3.S.: Unless otherwise determined by the Executive Secretary, applicant for a groundwater discharge permit ..shall include the following information: S. A closure and postclosure maintenance plan demonstrating the measures to prevent ground water contamination during the closure and postclosure phases of operation.*

### **INTERROGATORY STATEMENT:**

*In accordance with UAC R317-6-6.3.S, please provide a plan for closure and post-closure maintenance that discusses post-closure maintenance requirements and identifies measures that will be taken to prevent groundwater contamination during the facility's closure and postclosure phases and to minimize the need for active maintenance following closure. Maintenance of the cover and erosion control systems should also be addressed.*

*Please provide analyses and discussion of the long-term performance of the cover system considering wind erosion, slope stability, settlement, seismic events, etc. Please describe and provide a basis for the demonstration period during the interim period of site transfer to the custodial party. Please demonstrate that the cover system will remain effective for 1000 years,*

*to the extent achievable, and for a minimum of 200 years and require minimal maintenance following closure.*

**BASIS FOR INTERROGATORY:**

*The licensee should demonstrate that the cover system and other closure design control features will remain effective for 1000 years, to the extent achievable, and for a minimum of 200 years and require minimal maintenance following closure without posing risks due to the release of radiological and potentially hazardous constituents.*

*The following portion of the 1st Round Interrogatory on Rock Cover (Interrogatory R313-24-4-17/01) is combined and moved to this section - Post-Closure Drainage and Erosion Controls and Post-Closure Maintenance; please provide analyses (or modeling) and discussion of the long-term performance of the cover system and associated erosion controls following closure. Section 6.0 of the Tailings Reclamation and Decommissioning Plan (Hydro-Engineering, L.L.C. 2006) discusses the design of the drainage and erosion control systems for reclamation, however, the section does not appear to thoroughly address post-closure performance required to demonstrate with reasonable assurance that the integrity of the cover system will be maintained and will control radiological and non-radiological hazards for a minimum of 200 years, and to extent achievable, for 1,000 years. Section 6.0 and prior responses indicate that the primary concern for disruption of the cover is erosion by water with the cover designed to accommodate a Probable Maximum Flood (PMF).*

**REFERENCES:**

*Plateau Resources, Ltd., "Tailings Reclamation and Decommissioning Plan for Shootaring Canyon Uranium Project", Dated December 2005, Revised December 2006.*

*Plateau Resources, Ltd., "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility," Dated December 2005, Revised April 2007.*

## **INTERROGATORY R313-24-4-34/02: RADON RELEASE MODELING**

### **PRELIMINARY FINDINGS:**

*Refer to R313-24-4(2)(J)(ii): Clarifications or Exceptions. "Utah Administrative Code, Rule R317-6, Ground Water Quality Protection" for ground water standards in "Environmental Protection Agency in 40 CFR part 192, subparts D and E" as found in the Introduction, paragraph 4; or "Environmental Protection Agency in 40 CFR part 192, subparts D and E (48 FR 45926; October 7, 1983)" as found in Criterion 5;*

*Refer to R313-24-4 and 10 CFR Part 40, Appendix A, Criterion 6(1): "In disposing of waste byproduct material, licensees shall place an earthen cover (or approved alternative) over tailings or wastes at the end of milling operations and shall close the waste disposal area in accordance with a design which provides reasonable assurance of control of radiological hazards to (i) be effective for 1,000 years, to the extent reasonably achievable, and, in any case, for at least 200 years, and (ii) limit releases of radon-222 from uranium byproduct materials, and radon-220 from thorium byproduct materials, to the atmosphere so as not to exceed an average release rate of 20 picocuries per square meter per second (pCi/m<sup>2</sup>s) to the extent practicable throughout the effective design life determined pursuant to (1)(i) of this Criterion. In computing required tailings cover thicknesses, moisture in soils in excess of amounts found normally in similar soils in similar circumstances may not be considered. Direct gamma exposure from the tailings or wastes should be reduced to background levels. The effects of any thin synthetic layer may not be taken into account in determining the calculated radon exhalation level. If non-soil materials are proposed as cover materials, it must be demonstrated that these materials will not crack or degrade by differential settlement, weathering, or other mechanism, over long-term intervals."*

*Refer to R313-24-4 [10 CFR 40 Appendix A(6)(6)]: The design requirements in this criterion for longevity and control of radon releases apply to any portion of a licensed and/or disposal site unless such portion contains a concentration of radium in land, averaged over areas of 100 square meters, which, as a result of byproduct material, does not exceed the background level by more than: (i) 5 picocuries per gram (pCi/g) of radium-226, or, in the case of thorium byproduct material, radium-228, averaged over the first 15 centimeters (cm) below the surface, and (ii) 15 pCi/g of radium-226, or, in the case of thorium byproduct material, radium-228, averaged over 15-cm thick layers more than 15 cm below the surface. Byproduct material containing concentrations of radionuclides other than radium in soil, and surface activity on remaining structures, must not result in a total effective dose equivalent (TEDE) exceeding the dose from cleanup of radium contaminated soil to the above standard (benchmark dose), and must be at levels which are as low as is reasonably achievable.*

### **INTERROGATORY STATEMENT:**

*Please provide additional justification for the moisture content and dry density values proposed or, alternatively, more conservative values should be substituted in the modeling (refer to the discussion included in the Basis for Interrogatory).*

*Please provide adequate justification to support taking any credit for the presence of the HDPE geomembrane for reducing radon release in the long-term after the geomembrane's radon release barrier efficiency is essentially no longer effective.*

*Provide adequate justification for not completing a radon release simulation where the radon attenuation effects of the cover system layers overlying the radon barrier layer component of the cover are neglected, or include this simulation.*

**BASIS FOR INTERROGATORY:**

*In their response to Round 1 of this Interrogatory, Uranium One has not demonstrated that the (long-term) moisture content (24 percent) and dry density values (90 percent for Shootaring Canyon Dam-derived clay materials and 86 percent for alternate clay source-derived clay materials) specifically selected for use in the radon release modeling are sufficiently conservative to bound the range of uncertainty associated with the long-term values of moisture content and dry density that could occur in the radon barrier layer. Variations in the moisture content and dry density of the compacted clay cover layer could likely occur over its design life and such variations need to be considered in evaluations performed to estimate long-term radon emission rates through the cover system (DOE 1989, Section 7.1; EPA 2004, Section 2.3.2.2.8). Additional justification should be presented for the values proposed or, alternatively, more conservative values should be substituted.*

*Applicable/relevant guidance for estimating long-term moisture content and dry density values for radon barrier layers, including the need for considering possible variations in climate, consideration of physical processes that would be involved, and the possibility of using the -15-bar moisture content of the radon barrier material as a reasonable lower bound estimate of the long-term radon barrier layer moisture content for conducting a worst-case radon release model simulation, are given in NRC Regulatory Guide 3.64 (NRC 1989, pp. 3.64-2 through 3.64-9) and DOE (1989, pp.163-176).*

*The HDPE geomembrane will have a finite effective service life (see Interrogatory R313-24-4-26/01: INFILTRATION AND CONTAMINANT TRANSPORT MODELING above). Therefore the HDPE geomembrane would provide a measure of conservatism for the radon release modeling only during the active service life of that geomembrane. Adequate justification needs to be provided to support taking any credit for the presence of the HDPE geomembrane for reducing radon release in the long-term after the geomembrane's radon release barrier efficiency is essentially no longer effective.*

*In addition, Uranium One has not provided adequate justification for not completing a radon release simulation where the radon attenuation effects of the cover system layers overlying the radon barrier layer component of the cover are neglected. Performance of such an analysis case is consistent with precedence that has been used for many years on the UMTRA Project where materials above the radon barrier layer were not modeled (DOE 1989, p. 170). Radon release simulations completed for other similar facilities designed and/or constructed in the State of Utah (Monticello tailings repository final cover system – Waugh and Richardson 1997, p. D-41; Moab tailings repository final cover system (Office of Environmental Management 2006) each*

*included one or more simulation cases where the cover layers overlying the radon barrier layer were not included in the radon release modeling.*

**REFERENCES:**

*Plateau Resources, Ltd., "Tailings Reclamation and Decommissioning Plan for Shootaring Canyon Uranium Project", Dated December, 2005.*

*DOE, 1989, "Technical Approach Document," Uranium Mill Tailings Remedial Action Project, Rev. II, Section 7.1, "Design of the Radon Barrier". U.S. Department of Energy, UMTRA-DOE/AL 050425.0002. Albuquerque, New Mexico. December 1989.*

*EPA 2004. "Draft Technical Guidance for RCRA/CERCLA Final Covers", USEPA - USACE Superfund Partnership Program Policy, Guidance, and Activities, Chapter 2. <http://hq.environmental.usace.army.mil/epasuperfund/geotech/>*

*Plateau Resources, Ltd., "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility" Amended December, 2005, Revised April 2007.*

*Plateau Resources, Ltd., Responses to Round 1 TMP Interrogatories, April 2007*

## **INTERROGATORY R313-24-4-36/02: OPERATIONAL DUST CONTROL**

### **PRELIMINARY FINDING:**

*Refer to R313-24-4, 10 CFR 40 Appendix A(8): To control dusting from tailings, that portion not covered by standing liquids must be wetted or chemically stabilized to prevent or minimize blowing and dusting to the maximum extent reasonably achievable. This requirement may be relaxed if tailings are effectively sheltered from wind, such as may be the case where they are disposed of below grade and the tailings surface is not exposed to wind. Consideration must be given in planning tailings disposal programs to methods which would allow phased covering and reclamation of tailings impoundments because this will help in controlling particulate and radon emissions during operation. To control dusting from diffuse sources, such as tailings and ore pads where automatic controls do not apply, operators shall develop written operating procedures specifying the methods of control which will be utilized.*

### **INTERROGATORY STATEMENT:**

*Please provide written procedures, material specifications, and supporting detail on dust suppression methods to be used on the tailings piles and drying and packaging operations. Please state the reasonable requirements for dust suppression for these operations.*

*Please provide specifications on the alternative reagents that might be used for dust suppression associated with both the tailings piles and the drying and packaging operations.*

*Include details on methods for dust suppression for interim covering a portion of a cell when not working in the area, and discuss the impact it will have the engineering properties of the tailings (long and short term), and state the justification for the impacts. Also, provide ALARA evaluations performed for dust suppression to ensure that airborne effluent releases are reduced to levels as low as reasonably achievable.*

### **BASIS FOR INTERROGATORY:**

*Sections 4.1.1 and 6.2 of the TMP briefly reference applying agents for dust suppression but do not provide sufficient information. The applicants' initial response stated "The RMTP methodology requires further evaluation and refinement, and the production of dust from the paste or moist tailings is not yet quantified. It will be necessary to conduct testing of the fluid extraction process, reduced moisture tailings properties, and available dust suppression agents prior to operation of the mill."*

*The Division requires a consideration of airborne effluent releases to ensure they are ALARA and that population exposures are reduced to the maximum extent reasonably achievable.*

### **REFERENCES:**

*Plateau Resources, Ltd., "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility," Dated December 2005, Revised April 2007.*

*Regulatory Guide 3.56, "General Guidance for Designing, Testing, Operating, and Maintaining Emission Control Devices at Uranium Mills," Task CE 309-4, USNRC, May, 1986.*



## **INTERROGATORY R313-24-4-37/02: COST ESTIMATES FOR DECOMMISSIONING AND RECLAMATION**

### **PRELIMINARY FINDING:**

*Referring to R313-24-4: Financial surety arrangements must be established by each mill operator prior to the commencement of operations to assure that sufficient funds will be available to carry out the decontamination and decommissioning of the mill and site and for the reclamation of any tailings or waste disposal areas. The amount of funds to be ensured by such surety arrangements must be based on Executive Secretary-approved cost estimates in a Executive Secretary-approved plan for (1) decontamination and decommissioning of mill buildings and the milling site to levels which allow unrestricted use of these areas upon decommissioning, and (2) the reclamation of tailings and/or waste areas in accordance with technical criteria delineated in Section I of this Appendix. The licensee shall submit this plan in conjunction with an environmental report that addresses the expected environmental impacts of the milling operation, decommissioning and tailings reclamation, and evaluates alternatives for mitigating these impacts.*

### **INTERROGATORY STATEMENT:**

*After all design changes are made for the facility and its component equipment, structures, and systems pursuant to this and subsequent rounds of interrogatories, please respond to the following general and specific directives and requests:*

- 1. Provide the basis for EACH quantity, duration, allowance, and lump sum identified in the cost estimates presented in Section 11 of the “Tailings Reclamation and Decommissioning Plan for Shootaring Canyon Uranium Project – Revised 2006.” This basis should be related in some way to the quantity of materials to be handled (based on relevant drawings) and a documented productivity for similar activities.*
- 2. Estimate and include the cost of providing an appropriate level of security at the facility during reclamation and decommissioning.*
- 3. Either (A) make a connection between the structures, components, and systems listed in the second paragraph of Section 8.0 and the cost estimate presented in Section 11.1 OR (B) estimate and include the costs of decommissioning each of the structures, components, and systems listed in the second paragraph of Section 8.0*
- 4. Justify and provide references for unit costs used with quantity (hour, volume, area, etc) estimates shown throughout Section 11.*
- 5. Include an adder of 31.7 percent in salaries for individuals listed in Sections 11.1.18, 11.2.10, and 11.3.10 to account for total benefits provided to workers by the contractor, consistent with the information provided for construction workers in Table 5 of the report located at page 11 of <http://www.bls.gov/news.release/pdf/ecec.pdf>*
- 6. Justify OR revise and justify the allowance for Living Costs of \$40, \$67, and \$66 per person per day in Sections 11.1.18, 11.2.10, and 11.3.10, respectively. Justify discrepancies between the crew sizes used in Sections 11.2.10 and 11.3.10 for calculating*



*the allowance for Living Costs and the crew sizes stated in Item 1 of Sections 11.2 and 11.3, respectively, OR revise them to make them consistent.*

- 7. Include in the cost of verifying that soils have been properly cleaned up the cost of remedial action support surveys (Section 11.1.16). Justify, on the basis of MARSSIM guidance, the estimate that final status surveys will require only 48 person-hours. Include in the estimate the costs of analyzing remedial action support and final status survey samples.*
- 8. Include the cost of excavating, hauling, spreading, and compacting sandy Interim/Grading material, clay cover material, and Rocky Soil Cover material from local borrow sites, lack of royalty notwithstanding, (Section 11.2.4).*
- 9. Justify that 44 bags of grout per well is adequate for the purposes of abandoning monitoring wells (Sections 11.2.8 and 11.3.8).*
- 10. Ensure that the costs of environmental monitoring are included in closure and decommissioning costs estimates as appropriate.*
- 11. Apply 25 percent of subtotal costs for contingency allowance in Tables 12-1-Cell-1 and 12-1-Cell-2, consistent with relevant NRC guidance on cost estimates supporting determination of financial assurances.*
- 12. Revise the Uranium One Management Overhead percentage allowed in Tables 12-1-Cell-1 and 12-1-Cell-2 to reflect the possibility that the Tailings Reclamation and Decommissioning Plan will be performed by an independent third-party contractor. This percentage should allow for:*
  - Labor Overhead and Profit*
  - Materials and Subcontract Overhead and Profit*
  - General Conditions*
  - Subcontract Administration and Engineering*
  - Construction Oversight*
- 13. Ensure that all revisions made in Section 11 and 12 are incorporated into other sections of the Tailings Reclamation and Decommissioning Plan and elsewhere in the License Amendment Request.*

**BASIS FOR INTERROGATORY:**

*As examples of providing the bases for quantities, durations, allowances, and lump sums, consider the following.*

- Uranium One should explain the basis for estimating that the duration of the ore hopper demolition (Section 11.1.4) is two weeks. This duration should be related in some way to the quantities of materials to be handled and a documented productivity for similar activities.*

- *Two examples (from numerous instances) of needed explanations: Uranium One should explain why allowances of \$500 per month for Miscellaneous Office Supplies and of \$40,000 for the “Environmental Radiological & Other Required Surveying, Quality control & Testing Equipment” (Section 11.1.18) are adequate and appropriate. Where quantity of an individual cost item is readily identifiable (e.g., collecting and analyzing environmental monitoring samples and neutralization), the cost estimate should be identified and supported through reference to those quantities.*

*Unit costs presented throughout Section 11 should be justified and referenced to published sources, such as R.S. Means Building Construction Cost Data.*

*The allowances for contingency, management, and overhead costs are too small and should be increased.*

**REFERENCES:**

*US Bureau of Labor Statistics, “Employer Costs for Employee Compensation – March 2007”, <http://www.bls.gov/news.release/pdf/ecec.pdf> as of July 10, 2007.*

*US Nuclear Regulatory Commission. “NMSS Decommissioning Standard Review Plan,” NUREG-1727, September 2000.*

*US Nuclear Regulatory Commission. “Revised Analyses of Decommissioning Reference Non-Fuel-Cycle Facilities,” NUREG/CR-6477, December 2002.*

*Plateau Resources Ltd., “Tailings Reclamation and Decommissioning Plan for Shooting Canyon Uranium Project –2005; Garfield County, Utah”, December 2005, Revised: December 2006.*

## **INTERROGATORY R313-24-4-38/02: LONG TERM SURVEILLANCE COSTS**

### **PRELIMINARY FINDING:**

*Refer to R313-24-4, 10 CFR 40 Appendix A(9); The surety must also cover the payment of the charge for long-term surveillance and control required by Criterion 10. In establishing specific surety arrangements, the licensee's cost estimates must take into account total costs that would be incurred if an independent contractor were hired to perform the decommissioning and reclamation work. In order to avoid unnecessary duplication and expense, the Executive Secretary may accept financial sureties that have been consolidated with financial or surety arrangements established to meet requirements of other Federal or state agencies and/or local governing bodies for such decommissioning, decontamination, reclamation, and long-term site surveillance and control, provided such arrangements are considered adequate to satisfy these requirements and that the portion of the surety which covers the decommissioning and reclamation of the mill, mill tailings site and associated areas, and the long-term funding charge is clearly identified and committed for use in accomplishing these activities.*

### **INTERROGATORY STATEMENT:**

*Justify OR revise and justify the allowance of \$752,600 for DOE to provide Long Term Maintenance (as shown in Table 12-1-Cell-1 and 12-1-Cell-2). Base the allowance on EITHER:*

- 1. A detailed listing of activities and cost components (expressed as quantities with unit costs), together with an orderly estimate of associated costs, including an explanation of basis. This cost estimate should address planned and expected costs for a period of at least 100 years following reclamation and decommissioning and should consider a rate of return on secure financial instruments of 2 percent real.*
- 2. Justifying, including explanation of basis*
  - A value that was acceptable to DOE in 1978,*
  - That DOE still honors the 1978 basis for determining costs that should be covered for it providing Long Term Maintenance, and*
  - Cost escalation from 1978 to 2007 using an appropriate construction cost index.*

### **BASIS FOR INTERROGATORY:**

*Although the response to Round 1 Interrogatory R313-24-4-38/01 might be reasonable, no basis is provided that allows intelligent evaluation of the allowance for the cost of Long Term Maintenance by DOE. The basis for estimating the present value of costs for DOE to provide long-term surveillance and maintenance should be clearly elaborated.*

### **REFERENCES:**

*Plateau Resources Ltd., "Tailings Reclamation and Decommissioning Plan for Shootaring Canyon Uranium Project –2005; Garfield County, Utah", December 2005, Revised: December 2006.*