State of Utah
GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

Alan Matheson
Executive Director

DIVISION OF WASTE MANAGEMENT
AND RADIATION CONTROL
Scott T. Anderson
Director

May 9, 2016

Theresa Ballaine, Site Manager
Rio Algom Mining LLC
P.O. Box 218
Grants, New Mexico 87020

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
7003 2260 0003 2353 6262

RE: Stipulation and Consent Agreement, Lisbon Valley Facility
Supplemental Site Assessment
Radioactive Materials License Number 1900481

Dear Ms. Ballaine:

A copy of the duly executed Stipulation and Consent Agreement (SCA) regarding the Lisbon Valley Facility Supplemental Site Assessment is enclosed. The SCA is dated and effective as of May 9, 2016.

If you have questions, please call Tom Rushing at (801) 536-0080.

Sincerely,

Scott T. Anderson, Director
Division of Waste Management and Radiation Control

Enclosure: Stipulation and Consent Agreement

STA/TR/ka

c: Worthy Glover Jr., MMHRM, CPM, Health Officer, San Juan Public Health Department
Rick Meyer, Environmental Health Director, San Juan Public Health Department (copy)

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Mailing Address: P.O. Box 144880 • Salt Lake City, UT 84114-4880
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UTAH DIVISION OF WASTE MANAGEMENT AND RADIATION CONTROL

IN THE MATTER OF RIO ALGOM MINING LLC BHP BILLITON P.O. Box 218 1803 West Santa Fe Ave. Grants, NM 87020	STIPULATION AND CONSENT AGREEMENT

STATUTORY AUTHORITY

This STIPULATION AND CONSENT AGREEMENT (Agreement) is hereby made between Rio Algom Mining LLC (RAML) and the Director (Director) of the Utah Division of Waste Management and Radiation Control (Division) pursuant to the Utah Solid and Hazardous Waste Act, Utah Code Ann. (UCA) §§ 19-6-101 to 125, the Utah Radiation Control Act, UCA §§ 19-3-101 to 320 and the Utah Administrative Procedures Act, UCA §§ 63G-4-101 to 601.

APPLICABLE STATUTORY AND REGULATORY PROVISIONS

1. The Director is authorized to review and approve plans and issue administrative authorizations and orders in accordance with UCA §19-6-107.

2. RAML has been issued Radioactive Materials License UT 1900481 (License). Condition 53 of the License requires RAML to implement a groundwater compliance monitoring program containing elements outlined therein which include compliance with maximum groundwater concentrations for distinct parameters, listed as *Alternate Compliance Limits*, *Compliance Limits* and *Target Action Levels* for specific monitoring wells.

FINDINGS OF FACT

1. RAML owns the Lisbon Uranium Milling Facility (Facility) located in the Lisbon Valley, San Juan County in southeastern Utah, approximately two miles south of the town of La Sal.

2. Uranium mining operations began at the Facility in May 1972 and continued until October 1988, when the Lisbon Mine was closed. Milling operations continued until October 1988.

3. The Facility is comprised of two tailings impoundments and various drainage and reclaimed areas. The upper tailings impoundment covers approximately 46 acres and the lower impoundment covers approximately 48 acres. A seven-acre former mine water treatment pond called Bisco Lake was located east of the Facility. Underground mine water was discharged to Bisco Lake where it was treated with barium chloride to precipitate radium in solution.

4. The Facility's upper and lower tailings impoundments have undergone reclamation, including the placement of covers approved by the U.S. Nuclear Regulatory Agency (NRC). Dams were constructed between the impoundments and at the western end of the lower impoundment. Neither of the impoundments has constructed bottom liners. All former and

related constructed facilities were decommissioned and or demolished in 1996 and buried at the toe of the upper dam of the tailings ponds including approximately 70,000 cubic yards of coal ash, contaminated mill wastes, waste rock and 80 percent of the Bisco Lake sediment.

5. A RAML Corrective Action Plan (CAP) to address continuing tailings seepage and groundwater contamination was approved by the NRC in 1990. The CAP included pumping contaminated groundwater from remedial wells and discharging the pumped water to lined evaporation ponds located on top of the upper and lower covered impoundments.

6. Active groundwater pumping at the Facility continued until 2004 when the NRC approved a RAML 2001 application for Alternate Concentration Limits (ACLs) and a Long-Term Groundwater Monitoring Plan (LTGMP). ACLs were deemed appropriate at the time based on findings of an environmental assessment that was completed by RAML and approved by the NRC. The environmental assessment reflected no significant impacts at the Facility area and observations by RAML that although a significant mass of contaminants had been removed from the site groundwater, the groundwater quality at the Facility had not significantly improved.

7. Primary regulatory oversight of the Facility was transferred from the NRC to the Director in 2004, shortly after NRC approval of the ACLs.

8. The Director issued the License to RAML on February 8, 2005. The License was amended on March 6, 2006, January 2, 2010 and February 6, 2012 (Amendment 4).

9. RAML conducts groundwater monitoring at the Facility in accordance with License Condition 53 (Groundwater Compliance Monitoring Program) and the currently approved Groundwater Monitoring Plan (July 31, 2015), which includes the current LTGMP as an appendix.

10. License Condition 53.C defines "out-of-compliance" status regarding groundwater monitoring as "two consecutive exceedances of any contaminant concentration specified in tables 1, 2, or 3 of this license in any well" and specifies follow up conditions, including initiation of accelerated monitoring in the event that out-of-compliance status is detected at a monitoring well.

11. RAML exceeded contaminant concentration limits listed in the License Table 1, 2, or 3 two consecutive times at specific Facility groundwater monitoring wells as follows:

    a. RAML exceeded the License Target Action Level (TAL) for uranium (42.1 mg/L) in monitoring well RL-1 during the April 2010 and August 2010 quarterly monitoring events (two consecutive exceedances).

    b. RAML exceeded the License TAL for uranium (0.03 mg/L) in monitoring well EF-8 during the May 2011 and August 2011 quarterly monitoring events (two consecutive exceedances).

c. RAML exceeded the License ACL for arsenic (2.63 mg/L) in monitoring well OW-UT-9 during the November 2012 and March 2013 quarterly monitoring events (two consecutive exceedances).

12. The DIRECTOR issued a Notice of Enforcement Discretion and Confirmatory Action Letter (CAL) to RAML, dated February 7, 2011, regarding the initial out-of-compliance status at monitoring well RL-1. In the CAL, the Director noted that concentration trends at monitoring well RL-1 were not in conformance with the ground water modeling predictions (analyzed conditions) which formed the basis for NRC approval of the current Licensed ACLs and TALs.

13. In accordance with the February 7, 2011 CAL, the following actions were agreed to by RAML:

a. "*Rio Algom will hire an independent consultant, qualified to; 1. Review pertinent information and documents, including the existing ACL model, relevant laboratory data, LTGMP and associated technical information, and; 2. Provide potential additional ground water modeling (revised ACL model) as appropriate. Per the January 27, 2011 e-mail, Rio Algom expects that a qualified consultant can be under contract within 1 month of receipt of this Confirmatory Action Letter (CAL). Rio Algom will notify DRC once the contract has been finalized and provide information regarding the contractor name and individual qualifications;*

b. *On or before May 1, 2011 Rio Algom will provide the Executive Secretary a detailed written action plan and schedule for the investigation. The action plan is subject to review and approval by the Executive Secretary. The action plan and schedule will include a logic diagram identifying all actions, including dates that those actions will be initiated and completed, necessary to achieve outlined performance objectives. Performance objectives include but are not limited to:*

i. Justify whether the current RL-1 data set is or is not sufficient to depict the U concentration trend;

ii. Conclude with definitive evidence whether the Lisbon Valley Facility is operating within or outside of the analyzed condition of the Nuclear Regulatory Commission (NRC) approved "Application for Alternate Concentration Limits" (Approved May 11, 2004), and LTGMP, and;

iii. Determine whether the ACL model should be revisited/revised to account for more recent data

c. *On or before August 1, 2011 Rio Algom will provide the Executive Secretary a written final report. The report shall provide conclusions for all performance objectives listed in the approved action plan and schedule.*"

14. To date, two phases of the supplemental site assessment (hydrogeological investigations) have been completed at the Facility by RAML as approved by the Director. RAML submitted a Final Report for the Supplemental Site Assessment dated July 22, 2014, (SSA). The SSA included revised groundwater conceptual and numerical modeling and proposed revised ACLs and TALs.

15. While the RAML studies associated with the SSA have greatly improved the understanding of area geology and site specific groundwater and contaminant flow, according to the Director's comments regarding the SSA (Letter dated October 17, 2014), the studies to date have not adequately conceptualized site geology, groundwater flow, contaminant transport, and source impacts to support the approval of revised groundwater modeling and revised ACLs and TALs for the Facility in order to protect public health and the environment.

16. RAML responded to the Director's comments regarding the SSA review findings in a letter dated March 26, 2015, which included an appended list of responses to specific comments made by the Director. As well as addressing specific comments, the RAML response: 1) proposed additional modeling and field investigations as outlined in the letter, and, 2) agreed to provide a detailed work plan for the additional study after some additional communication with the Director regarding specific objectives and studies to be undertaken.

17. The Director and RAML met on May 13, 2015 to discuss the revised work plan to be submitted for additional study at the Facility. RAML submitted the revised work plan dated December 3, 2015 for review and approval by the Director. RAML also submitted two separate addendums to the work plan dated January 12, 2016 and March 4, 2016.

18. Following additional meetings, the Director and RAML agreed that the revised work plan would be approved through a Stipulated Consent Agreement.

19. Corrective action for the out-of-compliance wells/parameters shall be in accordance with the terms of this Agreement and based on outlined studies, objectives and schedules outlined in the current RAML work plan and addendums as discussed in the section below.

AGREEMENT

1. This Agreement supersedes and closes the September 10, 2012 and July 23, 2013 Stipulated Consent Agreements entered into between RAML and the DIRECTOR.

2. RAML shall complete all studies and activities according to the schedules listed in the December 3, 2015 Work Plan and Addendums, dated January 12, 2016 and March 4, 2016. (Attached as part of this Agreement).

3. In accordance with the December 3, 2015 Work Plan and Addendums, RAML shall complete the following outlined studies for the Facility:

    a. Site Wide Soil Water Balance Model.

i. Install temperature/soil moisture sensors to evaluate runoff and shallow recharge at Coyote Wash.

ii. Install three drive point piezometers at Coyote Wash locations to evaluate regional recharge/discharge of Coyote Wash.

iii. Provide estimate of recharge from the LaSalle Mountains.

iv. Study and define the tailings solution seepage source term in accordance with the activities included in the March 4, 2016 Work plan Addendum.

b. Geologic Model.

i. Provide three dimensional representation of the spatial structure of the groundwater flow system.

c. Hydraulic Testing.

i. Install data loggers to evaluate confined aquifer conditions at key locations.

ii. Install borings and monitoring wells in accordance with the general locations included in the January 12, 2016 Work plan Addendum.

iii. Conduct visual inspections and provide lithologic description of all new borings.

iv. Determine formation water saturation adjacent to core holes using downhole geophysical logging.

v. Conduct logs on core holes including; caliper, resistivity, self-potential, natural gamma ray and neutron logs.

vi. Conduct straddle packer hydraulic testing (pressure injection and recovery) in five to ten foot increments.

vii. Conduct rising head slug tests at any increments/areas where visible porosity is evident using straddle packers.

viii. Conduct pneumatic slug hydraulic testing at monitoring wells MW-123, MW-124, and MW-129, pneumatic sinusoidal hydraulic test at monitoring well MW-128, traditional pumping test at well MW-127, and straddle-packer testing in the 4 core holes.

d. Geochemical Evaluation.

i. Determine fault zone effects on groundwater quality along the fault zone to determine if pre-existing conditions are impacting concentrations of constituents of concern (COCs).

ii. Conduct evaluation of at least 10 samples from each of four new cores

that will be drilled at the site to determine geochemical characterization including petrography of cores, visual examination, x-ray diffraction and hydrochemical characteristics.

iii. Compare and quantitatively model source term groundwater chemistry with chemistry of groundwater along the fault zone.

e. Hydrochemical evaluation.

i. Conduct a chemical investigation of site wide groundwater to determine chemical signatures.

ii. Provide time series and binary solute-solute correlation, Piper and Stiff diagrams, geostatistics and thermodynamic diagrams.

iii. Expand chemical sampling list at selected wells to include Al, Cu, Fe, Cd, and Zn.

f. Geochemistry of the Lisbon Fault Zone.

i. Study Eh-pH, phase-equilibrium solubility.

ii. Study supergene weathering along the fault zone.

iii. Provide fault zone geochemical modeling using "React" and Xlt.

g. Attenuation of constituents of concern in both the Site's north and south plumes.

i. Evaluate sorption process in favorable areas of contaminant flow.

ii. Determine Distribution Coefficients (K_ds) and Retardation Factors ($R = K_d$ x bulk density / porosity) for constituents of concern.

iii. Use existing core for measurement and determination of location specific K_ds based on the presence of hydrous ferric oxide (HFO).

iv. Develop a surface complexation model to represent sorption reactions in select zones.

h. Coring and Well Installation.

i. Use core and well data to delineate the boundaries of the north and south contaminant plumes.

ii. Determine whether the Lisbon Fault acts as a flow boundary.

iii. Determine whether the contaminant plume from the tailings is affecting groundwater contaminant concentrations at monitoring well MW-116.

iv. Conduct evaluation of whole rock chemistry at cores C-125, C-126, C-127, and C-128.

i. Prepare a Flow and Transport Model to Determine Modified Alternate Concentration Limits (ACLs) and Target Action Levels (TALs).

i. Communicate and coordinate with the Director to discuss appropriate boundaries for flow modeling.

ii. Provide flow and transport modelling and proposed modified ACLs and TALs for the Lisbon Facility.

4. RAML shall provide notification of field activities to be undertaken at the Facility at least 14 days prior to commencement of the activities.

5. RAML shall dispose of all wastes generated at the Facility at facilities or locations approved to accept the generated wastes.

6. RAML shall submit to the Director a copy of all Health and Safety Plans prepared for the Facility field work no later than two weeks after preparation.

7. RAML shall submit a draft final report of the findings as described in Part 2.6 and Appendix H of the December 3, 2015 Work Plan on or before June 18, 2017, unless an extended schedule has been previously approved in writing by the Director, in which case RAML shall follow that modified schedule. Documentation of all studies and tasks performed by RAML shall be provided in the draft final report. The draft final report shall include, at a minimum:

a. Site characterization activities (drilling logs, aquifer testing, well installation details, well sampling details, groundwater sample analysis and interpretation, calculations of hydrogeologic parameters, etc.).

b. An updated site conceptual model including interpretation and results of all field testing performed.

c. A detailed description of the flow and solute transport model including summary tables for all inputs used in the modeling and electronic access to all input/output files.

d. Presentation of all results, conclusions and recommendations, including the development of preliminary ACLs and TALs based on modeling results.

STIPULATED PENALTIES

RAML shall pay a stipulated penalty of $500 per calendar day per violation upon written determination by the Director that RAML has violated any provision of this Agreement. The penalty amount stipulated is consistent with penalties for groundwater permit violations administered by the Division under the Utah Water Quality Act, Utah Code Ann. (UCA) §§ 19-5- 101 to 124.

1. If the Director determines that any of the information required by this Agreement to be submitted to the Director has omissions, is deficient in content or fails to provide any of the study elements required by this Agreement, the Director shall notify RAML in writing and RAML shall remedy such omissions or failures on or before a due date as determined appropriate by the Director, provided that such due date shall allow RAML a reasonable time frame within which to remedy such omissions or failures. If RAML fails to remedy such omissions or failures on or before the due date, RAML agrees to pay stipulated penalties of $500 per calendar day per violation.

2. RAML agrees to pay any stipulated penalties within 30 calendar days of written notice from the Director, in the form of a check, made payable to the State of Utah, and delivered or mailed to:

Scott T. Anderson, Director
Division of Waste Management and Radiation Control
Utah Department of Environmental Quality
195 North 1950 West
P.O. Box 144880
Salt Lake City Utah, 84114-4880

FORCE MAJEURE

RAML agrees to perform all requirements of this Agreement within the time limits established under this Agreement, unless the performance is delayed by a *force majeure*. For purposes of this Agreement, a *force majeure* is defined as any event arising from causes beyond the control of RAML or of any entity controlled by RAML including, but not limited, to contractors and subcontractors that delay or prevent performance of any obligation under this Agreement despite RAML's best efforts to fulfill the obligation.

RAML shall provide written notice to the Director of the occurrence of a *force majeure* that will cause or has caused a delay. The notice will include a description of the events leading to the *force majeure* and an estimate of the new timeline to perform the requirements.

NOTICE

RAML shall comply with each of the provisions of this Agreement. Providing false information shall subject RAML to additional civil penalties or criminal fines in excess of those stated in this document, up to the maximum allowable by law.

AGREED to this 9th day of May, 2016.

RIO ALGOM MINING LLC

By _____
Marny Reakes
Vice President

UTAH DIVISION OF WASTE MANAGEMENT AND RADIATION CONTROL

By _____
Scott T. Anderson
Director

Attachment 1:
RAML Work Plan for the Lisbon Facility Hydrogeological Supplemental Site Assessment
December 3, 2015

Attachment 2
RAML Work Plan Addendum Proposed Well and Core Locations January12, 2016

Attachment 3
RAML Work Plan Addendum Tailings Characterization and Water Balance Assessment
March 4, 2016