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File: EA1011-001

September 27, 2010

Paul Mercredi
Environmental Assessment Officer
Mackenzie Valley Environmental Impact Review Board
P.O. Box 938
YELLOWKNIFE NT X1A 2P1

VIA EMAIL

**Re: Scoping submission for the environmental assessment of Avalon Rare
Metals Inc.'s Nechalacho Rare Earth Element Project – EA1011-001**

Dear Mr. Mercredi:

Thank you for the opportunity to comment on the scope of the environmental assessment for the above-noted project. Indian and Northern Affairs Canada (INAC)'s detailed comments are attached for the Mackenzie Valley Environmental Impact Review Board (Review Board)'s consideration.

During the Technical Scoping Session held in Yellowknife on September 9-10, 2010, INAC identified the need for further information regarding Avalon's revised tailings management option and strategy for the proposed hydrometallurgical plant, including information on alternatives and contingencies. Avalon's new approach for the proposed hydrometallurgical plant deviates from the containment strategy described in the April 2010 Project Description Report submitted to the Mackenzie Valley Land and Water Board.

As indicated in the Technical Scoping Session, INAC anticipates that Avalon will provide additional information about its project plans as part of the Developer's Assessment Report (DAR). However, it is INAC's view that a description of tailings management is important to help define the Review Board's Terms of Reference (TOR) for the DAR. INAC therefore requests that Avalon provide this additional information as quickly as possible so that the Review Board can specifically capture it in the TOR.

INAC recognizes that the proposed project is of interest to Aboriginal peoples in the North and South Slave region. As you are aware, the federal departments' approach to the Crown's duty to consult builds upon consultative processes that already occur, which in this case includes the environmental assessment process. It should be noted that INAC and the other federal departments will also take into account any engagement activities undertaken by Avalon Rare Metals Inc. when assessing the

extent of consultation conducted with respect to this project proposal.

As is the case in any environmental assessment, INAC anticipates that as this environmental assessment process progresses, some of the issues identified in the attached submission may be resolved and may not require further examination, or new issues may be added.

If you have any questions regarding INAC's comments, please contact Charlotte Henry at (867) 669-2616 or Nathen Richea at (867) 669-2657.

Sincerely,

A handwritten signature in blue ink, consisting of a series of vertical lines followed by a horizontal line, with the name "F. Jackson" written in cursive below it.

FOR Teresa Joudrie
Director, Renewable Resources and Environment

Encl.

**Avalon Rare Metals Inc.'s
Nechalacho Rare Earth Element Project
EA1011-001
Scoping Questions - INAC Submission**

1. What biophysical, socio-economic and cultural issues should the Review Board consider during the environmental assessment and why?

BIOPHYSICAL

a. Water Quality

INAC will be looking for direct evidence on background conditions at and near the proposed sites and will be relying heavily on baseline data and assessments conducted by Avalon to assist the development of appropriate water quality objectives. INAC will also be relying on detailed descriptions and assessments of how Avalon's tailings discharges will affect the receiving environment both spatially and temporally, which will in part aid the establishment of appropriate effluent quality criteria. The above aspects, along with the following items, should be addressed:

- Current (resubmitted) as well as updated and complete water balances, including different recycling scenarios. The analysis should include a description of expected long-term quality of recycled water and describe the assimilative capacity of the Drizzle-Murky lake, direct pumping between Drizzle and Thor Lake, and the entire Thor system and Pine Point system(s);
- Describe the refresh rate of Thor Lake (relate this to the volume used in the mining process) and other lakes in the downstream environment;
- Established and delineated baseline and background water quality should be provided. Differentiate what represents natural background water quality versus what is a result of previous activity (i.e. exploration and previous work). Outline the selection process and overall characterization of reference lake(s);
- Technical evaluations of the efficiency of the Tailings Facility discharge to meet objectives in the downstream environment over time. Include an explanation on how the facility meets and exceeds discharge water quality requirements for Metal Mining Effluent Regulation (MMER) metals but also for other metals not listed in the regulations. Consider flocculent and reagent toxicity and potential pH, salinity, sulphate and other water quality changes and interactions;
- Describe the conditions and volumes that will initiate pumping from Drizzle Lake to Thor Lake through the proposed pipeline.
- Establish proposed receiving water mixing zones and describe the changes that will be observed in water quality in the mixing zones and systems including seasonal effects on the efficiency of the tailings management areas and strategies;

- Compare expected effluent discharge concentrations to background water quality and describe how discharge will meet levels protective of aquatic life in the immediate and downstream environment;
- Describe the potential for concentration of conservative parameters (e.g. ammonia, chloride, nitrate, etc.) over the long term at the mine site due to the cyclical nature of the water management scenario and timelines associated with reaching levels that may be detrimental to the ecology of the system (e.g. trophic status);
- Determine the magnitude and extent of any acceptable change to the aquatic environment; describe proposed levels of effects (low, medium, high) or the highest expected level of effect anticipated. Propose potential mitigation actions that could be implemented if the magnitude or extent of actual changes exceeds the proposed levels; and,
- Describe any impacts to potable water quality for the camp and other downstream users.

b. Hydrogeology

- Impacts to groundwater flow as a result of underground mining operations at the mine site;
- Describe the deep groundwater quality and provide updates with supporting documentation on expected volumes of groundwater inflow at the mine site;
- Provide a hydrogeological characterization of the shallow groundwater in the active layer at the mine site;
- Describe how changes in the permafrost conditions and active layer melt may change the quality of groundwater that enters the mine workings over time, particularly from the active layer at the mine site;
- Complete hydrogeological characterization of groundwater and aquifer conditions including potential impacts to groundwater in the open pit disposal method preliminarily proposed for the Pine Point site at the Technical Scoping Session; and,
- If exfiltration through an existing pit is selected as one of the preferred options for the Pine Point site, the hydrogeological information must include a review of impact on local aquifer, travel time to Great Slave Lake, volume of ex-filtrate, migration pathway (location and depth), monitoring points, distinct points of control and contingencies for non-compliant discharges.

c. Flotation Tailings Management

- Descriptions of the static and kinetic testing data, acid generating and metal leaching characteristics of the various tailings and sludge materials. Describe how the tailings will behave during operations and following closure;
- Describe the volumes of all tailings including moisture content (solids vs. liquid fractions) and the characteristics and expected volume of backfill tailings;
- Describe how pore water quality of the tailings will be monitored and studied during the course of the mine;

- Describe the required capacity of the tailings facility over the course of the mine and how modifications or raises to the tailings facility will be coordinated and scheduled; and,
- Outline potential closure methods of the Tailings Management Area (including alternative locations). Different closure methods should be considered and evaluated.

d. Waste Rock Management

- Descriptions of the static and kinetic testing data, acid generating and metal leaching characteristics of waste rock stored above or below ground. Describe how the waste rock will behave during operations and following closure;
- Describe the volumes of all waste rock generated during mining;
- Describe the waste rock management strategy for the site, including storage locations; and,
- Outline potential closure methods for any waste rock storage areas (including alternative locations). Different closure methods should be considered and evaluated.

e. Hydrometallurgical/Processing

- Current (resubmitted) as well as further updated and complete water balance from the proposed source and alternative sources;
- Thoroughly detail the processing of the concentrate and the physical characteristics of the concentrate as it passes through the hydrometallurgical plant including end products;
- Clearly identify all waste streams, characteristics, volumes and disposal methods (i.e. tailings, scrubber sludge, spent solvent, coal ash (bottom and fly), etc.);
- Fully describe the condition of the tailings, including potential constituents and contaminants, percent water content, supernatant volumes, and disposal contingencies;
- Provide clear concepts for tailings disposal and tailings containment area closure including full discussion, evaluation and ranking of other potential options;
- Specify details for types of tailings disposal including storage capacities, alternative treatment and storage options, contingencies for additional storage capacity if there are shifts in the mine plan, and descriptions of the disposal options for supernatant water over time and its drainage pathways;
- Fully describe reagent storage methods and evaluation of potential water quality issues including those associated with run-off from stockpiles of coal and limestone;
- Describe how the addition of limestone to neutralize the tailings stream will influence the chemical characteristic of the waste stream and any by-products that are created;
- Fully outline the plan and source of “clean” coal including contingencies in the event that clean coal is in short supply or completely unavailable and outline the worst case scenario from using other types of coal;

- Evaluate the potential for impacts to site water quality from airborne emissions including dusting from stockpiles and process and stack emissions; and,
- Fully evaluate the benefits of processing the ore on site vs. trucking it out to other processing locations. Discussion of the differences in transport, use and storage of reagents, chemicals and other materials on-site and off-site should be included as well as the potential risks to the environment.

f. Monitoring

- How and what type of monitoring will be performed to ensure that environmental objectives are met during construction and operation at all potential development sites; and,
- INAC has prepared *Guidelines for Designing and Implementing Aquatic Effects Monitoring Programs for Development Projects in the Northwest Territories*, which were released in 2009. The Guidelines outline 'Steps' for assessing potential effects in the aquatic environment, some of which are applicable to the environmental assessment stage. INAC would like to see aspects of the initial 'Steps' as part of the DAR or Appendices, which include:
 1. Identify issues and concerns associated with the project relative to potential effects on the aquatic ecosystem;
 2. Problem formulation for aquatic effects and monitoring; and,
 3. Development of data quality objective within a conceptual study design.

g. Closure and Reclamation

- Conceptual descriptions and assessments of reclamation options and activities should be developed to meet conceptual closure objectives as identified in a preliminary Closure and Reclamation Plan. Closure planning should include designing-for-closure and attempt to provide sustainable closure options; and,
- Information related to the potential for proposed progressive reclamation should be provided.

h. Waste Management

- Information is needed on the requirements for and location of any landfill, landfarms and disposal sites, including containment method and the types of materials to be disposed of;
- Describe the proposed option for the disposal of sewage sludge and any other options or alternatives that have been considered; and,
- Describe how hazardous and non-hazardous waste will be managed and disposed on site.

i. Soil / Quarries

- It is implied that some construction materials will be required for initiation of mine development which may come from underground or stockpile locations, however, if source quarries or stripping is required to attain these materials then they must be clearly indicated and described in the DAR;

- Description of how overburden will be stripped and stockpiled including methods intended for record keeping (type, volume, etc.) such that the materials can be used for reclamation activities; and,
- Description of the source, location and volumes required for limestone at the hydrometallurgical site including implications of this quarry on the local environment (land, air and water).

j. Truck Transportation and Barging Activities

- Information related to increased truck traffic and increased risk of highway incidents; and,
- Information related to increased barge traffic and how barging incidents will be handled (i.e. intentions for barge and contents that may end up in water).

k. Other

INAC expects that the following areas will be included in the environmental assessment: impacts to wildlife, wildlife habitat including vegetation, wildlife harvesting, species at risk, migratory birds, impacts to fish, fish habitat and fish harvesting. INAC will not be providing detailed comments on these areas at this time. INAC provides the following general biophysical comment:

- Impacts of the environment on the general project should also be considered in the assessment, e.g. how changes in the climate could affect the project.

SOCIO-ECONOMIC & CULTURAL

- INAC requests that the developer provide an ongoing record of community engagement, which provides a summary of any issues or concerns raised and any resolution or next steps;
- Employment, training opportunities, community capacity, traditional harvest and land use are all issues that merit consideration; and,
- Both scientific and traditional knowledge should be considered in the assessment.

2. What physical works and activities should the Review Board consider as part of the development?

The scope of the development should be based upon Avalon’s Land Use Permit (MV2010D0017) and Water Licence (MV2010L2-005) applications which should be subject to term (18-25 years) and type of mining activity (underground mining). The emphasis should be on planned site infrastructure:

- Mine (underground);
- Flotation plant;
- Hydrometallurgical plant;
- Water supply (at both sites);

- Tailings management facilities (at both sites);
- Camp facilities and infrastructure (at both sites);
- Sewage treatment facilities (at both sites);
- Transportation routes within the sites (roads, trails and airstrip);
- Collection (interception) trenches and sediment collection ponds;
- Pump house and water intake;
- Fuel, chemical and explosives storage facilities;
- Coal and limestone storage;
- Concentrate loading and storage (at both sites);
- Proposed drainage controls along camp facilities;
- Dock facilities (at both sites);
- Utility and piping routes;
- Service complex and mine equipment management building;
- Power generation and heat recovery facilities;
- Waste management facilities;
- Vents and underground raise areas; and,
- Temporary camp facilities.

3. What area and what time period should the Review Board use for assessing potential impacts (including project-specific and cumulative impacts) from this proposed development?

Project-specific

- The temporal scope should be specific to each valued component. Generally speaking, the scope may begin as early as exploration of the site and could extend to post mine closure. For hydrology, the effects should be considered in perpetuity, as the changes to the landscape will become permanent features at the site.
- The spatial scope should also be specific to each valued component. Generally speaking, the scope of the assessment should include the immediate receiving environment and downstream drainage areas, including Great Slave Lake.

Cumulative Effects

- Paragraph 117(2)(a) of the *Mackenzie Valley Resource Management Act* requires that every environmental assessment “include a consideration of ... any cumulative impact that is likely to result from the development in combination with other developments”. INAC notes that the Review Board has developed cumulative effects assessment guidance (see the Review Board’s *Environmental Impact Assessment Guidelines* (2004), Appendix H) to provide further details around the implementation of this requirement.
- All aspects of transportation (truck, barge and train) should be considered within the scope of the cumulative effects assessment.

- The temporal scope should be specific to each valued component. Generally speaking, the scope may begin as early as exploration of the site and could extend to post mine closure.
- The spatial scope should be specific to each valued component. With respect to water quality and quantity, the scope of the cumulative effects assessment should include the immediate receiving environment and downstream drainage areas, including Great Slave Lake.

4. What evidence (if any) from previous studies, management plans, or environmental assessments should the Review Board transfer onto the public record for this environmental assessment, and why?

INAC recommends that its *Mine Site Reclamation Guidelines* (2007) and *Mine Site Reclamation Policy for the Northwest Territories* (2002) be added to the public record for this environmental assessment. These documents will assist the developer in preparing a preliminary closure and reclamation plan, which outlines the proposed methods of closure of the various mine components. A conceptual and preliminary closure and reclamation plan should be submitted by the developer for review. INAC's *Guidelines for Spill Contingency Planning* (2007) should also be added to the public record.

In addition to the above documents, INAC also recommends that its *Guidelines for Designing and Implementing Aquatic Effects Monitoring Programs for Development Projects in the Northwest Territories* (2009) be added to the public record for this environmental assessment. This document will assist the developer and the environmental assessment process by identifying the potential impacts of the development and the receptors which should be monitored. An AEMP will provide an early warning of negative effects on the water and aquatic environment which is then to be used to manage the project and reduce potentially significant adverse effects. The AEMP program is to work in conjunction with MMER-EEM requirements.

The abovementioned publications are available online at:

- *Mine Site Reclamation Guidelines* (2007): <http://www.ainc-inac.gc.ca/ai/scr/nt/ntr/pubs/MSR-eng.asp>
- *Mine Site Reclamation Policy for the Northwest Territories* (2002): <http://www.ainc-inac.gc.ca/nth/mm/pubs/recpolnwt/recpolnwt-eng.pdf>;
- *Guidelines for Spill Contingency Planning* (April 2007): [http://www.ainc-inac-inac.gc.ca/ai/scr/nt/pdf/SCP-EUD-eng.pdf](http://www.ainc-inac.gc.ca/ai/scr/nt/pdf/SCP-EUD-eng.pdf) ; and,
- *Guidelines for Designing and Implementing Aquatic Effects Monitoring Programs for Development Projects in the Northwest Territories* (2009): <http://www.mvlwb.ca/mv/Registry/2010/MV2010L1-0001/app/MV2010L1-0001%20-%20AEMP%20Guidelines%20-%20Vol%206%20-%20May2010.pdf>

5. What alternative ways of developing the proposed project – to prevent potential significant adverse impacts - should the Review Board consider during the environmental assessment?

INAC recommends that the following alternatives to developing the proposed project be fully considered:

- The impacts to the environment related to alternative ore processing options and techniques;
- Alternative tailings management (including alternative management and disposal techniques and locations) should be evaluated and considered; and,
- Alternative final processing options including trucking it out for processing outside of the Northwest Territories.