

**Yukon Environmental & Socioeconomic Assessment Act**  
**Final Decision Document**

This document meets the Yukon government's requirements as a Decision Body as set out in the *Yukon Environmental & Socioeconomic Assessment Act* APPL. NO. 0206-074

**Decision Document Issued By**

<b>YG Decision Body:</b>	Assessment and Abandoned Mines Branch, Energy, Mines and Resources
<b>Federal Decision Body(ies):</b>	n/a
<b>First Nation Decision Body(ies):</b>	n/a

**Project**

<b>Project Name :</b>	<b>Care and Maintenance for the Keno Hill Mines</b>	YESAA File Number <b>2006- 0293</b>
<b>Proponent Name:</b>	Elsa Reclamation and Development Company Ltd.	
<b>Project Description:</b>		
<p>The principal purpose of this project is to discharge waste water while carrying out care and maintenance activities associated with the existing treatment facilities and supporting infrastructure at the Keno Hill property. A water use licence will be required.</p> <p><u>Principal activities:</u></p> <ul style="list-style-type: none"> <li>• Direct use of water and waste water for lime mixing operations</li> <li>• Deposit of waste into water and receiving environment</li> <li>• Operation and maintenance of existing 5 waste water treatment facilities and associated settling ponds</li> <li>• Storage of waste water in the treatment settling ponds and Valley Tailings Area</li> <li>• Maintenance of existing diversion channels (Porcupine Creek) and ditches</li> </ul> <p><u>Accessory activities include:</u></p> <ul style="list-style-type: none"> <li>• Maintenance and operation of site infrastructure related to water treatment systems and access roads</li> <li>• Transport of milk of lime solutions to site</li> <li>• Periodic desludging of treatment settling ponds and transportation or pumping of sludge to sludge storage areas</li> <li>• Water sampling (effluent and receiving waters)</li> <li>• Physical inspection and monitoring of adits, adit structures and facilities including those known as Silver King, Husky SW, Husky, valley tailings facilities, valley pumping facilities (Pumphouse Pond), Elsa Townsite, No Cash 500, Dixie, Ruby 400, Birmingham, Hector 400, Galkeno 300 &amp; 900, Bellekeno 600 &amp; 200, Keno 700, Shamrock J18 Raise, Lucky Queen, Onek 400, and Wernecke Camp</li> <li>• Removal and clean up of infrastructure related to adits, adit structures and</li> </ul>		

facilities

- Waste water treatment studies and test programs related to potential closure design options
- Receiving environment monitoring and sampling programs
- Operation, inspection and maintenance of the Valley Tailings Area
- Storage of sludge from treatment facilities and periodic decanting

The proposed project has been assessed based on the above activities as they relate to waste water treatment and care and maintenance for the Keno Hill mines. This assessment did not consider mine closure, development plans or exploration activities

**Other Decision Bodies**

<b>Other Decision Body Consultation:</b>	n/a
<b>Consolidated Decision Document:</b>	N/A

**Non-Self Governing First Nations**

<b>Non-self governing First Nation Consultation:</b>	n/a
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**Decision**

Pursuant to ss. 75, 76 and 80, the Yukon government has considered the <i>YESAA</i> Assessment and:	
<input type="checkbox"/>	a) Accepts the following recommendation(s) <ul style="list-style-type: none"> <li>• <i>[List Terms and Conditions and responsible YG department where applicable]</i></li> <li>•</li> </ul>
<input type="checkbox"/>	b) Rejects the following recommendation(s) for the following reason(s): <ul style="list-style-type: none"> <li>• <i>[List specific reasons]</i></li> <li>•</li> </ul>
<input checked="" type="checkbox"/>	c) Varies the following recommendation(s) as follows for the reason(s) specified: <p><b>The following recommendations remain unchanged:</b></p> <ol style="list-style-type: none"> <li>1. The proponent shall continue to sample and measure contaminant levels in waters being discharged in order to meet the needs of the AMP below.</li>   <li>5. Construct and or maintain water treatment and retention infrastructure in order to</li> </ol>

	<p>not release non compliant water into the environment.</p> <p>6. Ensure that all settling ponds are lined to prevent release of non-compliant water through ground.</p> <p>8. Care and maintenance water licence term revised to a five years.</p> <p>9. Ensure all adits and other historic mine workings that are potentially dangerous are secured from public access or, at a minimum, well signed to inform of risks to public and site employees;</p> <p>11. Proponent shall ensure that all solid waste from project activities is transported to and deposited at an approved solid waste disposal facility.</p> <p>12. The proponent shall ensure employees have adequate training and comply with Occupational Health and Safety Regulations with regard to the handling and use of hydrated lime and the entry into confined spaces.</p> <p>13. Treatment areas that could entrap wildlife should be suitably configured to prevent such entrapment using such implements as gates and fences.</p>
	<p><b>The following recommendations are varied with reasons provided:</b></p> <p>2. Water samples from all treatment facilities should be collected from end of pipe.</p> <p><b><u>Replaced with:</u></b> Water samples from all treatment facilities should be collected from end of pipe or last point of control.</p> <p><b><u>Rationale:</u></b> There may be situations where end of pipe sampling is not possible.</p> <p>3. Levels of zinc, cadmium, lead and arsenic being discharged should endeavor to meet CCME discharge standard for aquatic life guidelines and as a minimum the contaminant water levels at discharge should be no higher than those of the previous water licence QZ96-001 and required at all treatment sites.</p> <p><b><u>Replaced with:</u></b> Discharge standards for treated effluent should be such that they do not allow an increase in the contaminant loading to the receiving environment from the levels allowed under the previous water licence QZ96-001.</p> <p><b><u>Rationale:</u></b></p>

CCME Canadian Water Quality Guidelines for the Protection of Aquatic Life outlines conditions for healthy aquatic life and are not discharge standards.

There are more sources of contaminant loading of the receiving environment from this site, than have yet been identified. Data from receiving waters sampling over the past ten years, supplied by the proponent, shows some improvement in receiving water quality since 1988. While water treatment has removed a considerable load of metal contaminants from entering the environment, the downstream concentrations of some metals remain higher than CCME Canadian Water Quality Guidelines for the Protection of Aquatic Life.

Closure planning activities for the site, which are currently underway, include the development of a comprehensive mass loading and water balance model. This model will allow treatment resources to be focused in a more efficient way. Until that time, contaminant loading from treatment sites should be kept to a practical minimum.

4. The proponent shall develop and maintain a receiving environment monitoring program for both macro and benthic invertebrate sampling at all receiving water sites to determine any changes or long-term trends in the aquatic health of receiving waters downstream of the Keno Hill mine site properties. Results shall be submitted to the appropriate regulator at a minimum, annually.

**Replaced with:**

The proponent shall develop and maintain a receiving environment monitoring program for both fish survey and benthic invertebrate sampling at all receiving water sites to determine any changes or long-term trends in the aquatic health of the receiving waters downstream of the Keno Hill mine site properties. Results shall be submitted to the appropriate regulator at a minimum, annually.

**Rationale:**

The word “macro” has been changed to “fish survey” for clarification.

7. Proponent must develop an Adaptive Management Plan with appropriate regulators that considers the following:

**Adaptive Management Plan (AMP)**

Adaptive management plans can be an effective way of identifying and responding to potentially adverse effects that may arise due to unpredictable change in the project environment. The proposed project involves the monitoring and treatment of metal laden water discharges coming out of old adits in a number of locations on the UKHM property. A complete understanding of the area hydrology is not understood at this time and requires the implementation of

programs to characterize hydrology and hydrogeology. In order to effectively mitigate potential effects of drastic changes in the hydrogeological regime (e.g. Galkeno 300) an adaptive management plan including the following information must be developed, for approval by the appropriate regulator.

Plan Objective – Develop a process that measures and identifies any changing, or new, water discharges and increases in contaminant concentrations on site, and triggers appropriate actions based on the potential environmental and socioeconomic effects of those changes.

Plan Goals – Establish and apply appropriate site specific water quality standards, with consideration of zinc, cadmium, lead and arsenic that protect aquatic life and the environment. Where possible acceptable metal concentrations detailed in the CCME Canadian Water Quality Guidelines for the Protection of Aquatic Life should be the objective, and as a minimum the contaminant water levels should be no higher than those of the previous water licence QZ96-001 should be required at all treatment sites. The plan should explicitly manage low level and incremental changes to flow and contaminant levels (Adaptive Management Plan) and drastic changes to flow and contaminant levels (Emergency Response Plan).

#### **Adaptive Management**

- Description of flows and contaminant concentrations from mine workings and historic conditions (baseline conditions)
- Routinely monitor existing treatment sites and mine workings to detect any increases in flow or contaminant concentrations.
- Routinely monitor untreated adits and discharges to detect any increases in flow or contaminant concentrations.
- Develop appropriate triggers/thresholds for response
  - a. Increases in a contaminant level approaching thresholds at a site should result in more frequent monitoring at that site.
  - b. If increases in flow and or concentration are approaching thresholds at a site, an action plan must be developed.
  - c. If flow and/or concentrations exceed a threshold at a site immediate notification to the appropriate regulator, and implementation of the action plan are required.
  - d. Action plans must be approved by the appropriate regulator.
  - e. Periodic review of the AMP with the appropriate regulator.
  - i. Regular reporting on all plans and studies is imperative.

#### **Emergency Response**

Development of a plan that will respond to drastic or unforeseen discharges or infrastructure failure to control large volumes of water and/or high contaminant concentrations from entering the environment. The plan should include but is not limited to the following:

- Details on the managing formangement of spring freshet volume.

- Describe immediate actions to control water flow until the contaminant levels can be measured and the risks or effects can be determined at which point appropriate actions are triggered.
- Where effluent volumes and contaminant levels are known, appropriate plans for dealing with infrastructure failure should be presented by the proponent and approved by the appropriate regulator.

**Replaced with:**

Proponent must develop an Adaptive Management Plan with appropriate regulators that considers the following:

**Adaptive Management Plan (AMP)**

Adaptive management plans can be an effective way of identifying and responding to potentially adverse effects that may arise due to unpredictable changes in the project environment. The proposed project involves the monitoring and treatment of metal laden water discharges coming out of old adits in a number of locations on the UKHM property. A complete understanding of the area hydrology is not understood at this time and requires the implementation of programs to characterize hydrology and hydrogeology. In order to effectively mitigate potential effects of drastic changes in the hydrogeological regime (e.g. Galkeno 300) an adaptive management plan including the following information must be developed, for approval by the appropriate regulator.

Plan Objective – Develop a process that measures and identifies any changing, or new, water discharges and increases in contaminant concentrations on site, and triggers appropriate actions based on the potential environmental and socioeconomic effects of those changes.

Plan Goals – Establish and apply appropriate site specific water quality standards, with consideration of zinc, cadmium, lead, arsenic and other contaminants, that protect aquatic life and the environment. Where possible, efforts must be made to minimize contaminant loading to the receiving environment. The plan should explicitly manage low level and incremental changes to flow and contaminant levels (Adaptive Management Plan) and drastic changes to flow and contaminant levels (Emergency Response Plan).

**Adaptive Management**

- Description of flows and contaminant concentrations from mine workings and historic conditions (baseline conditions)
- Routinely monitor existing treatment sites and mine workings to detect any increases in flow or contaminant concentrations.
- Routinely monitor untreated adits and discharges to detect any increases in flow or contaminant concentrations.
- Develop appropriate triggers/thresholds for response.
  - a. Increases in a contaminant level approaching thresholds at a site should result in more frequent monitoring at that site.

- b. If increases in flow and or concentration are approaching thresholds at a site, an action plan must be developed.
- c. If flow and/or concentrations exceed a threshold at a site immediate notification to the appropriate regulator, and implementation of the action plan are required.
- d. Action plans must be approved by the appropriate regulator.
- e. Periodically review the AMP with the appropriate regulator.
- i. Regular reporting on all plans and studies is imperative.

**Emergency Response**

Development of a plan that will respond to drastic or unforeseen discharges or infrastructure failure to control large volumes of water and/or high contaminant concentrations from entering the environment. The plan should include but is not limited to the following:

- Details on management of spring freshet volumes.
- Describe immediate actions to control water flow until the contaminant levels can be measured and the risks or effects can be determined at which point appropriate actions are triggered.
- Where effluent volumes and contaminant levels are known, appropriate plans for dealing with infrastructure failure should be presented by the proponent and approved by the appropriate regulator.

**Rationale:**

A change was made to the Plan Goals section to reflect the need to focus on loading rather than concentrations. Since the volume of unpredicted flows is unknown, establishing concentration standards would be inappropriate.

10. The proponent, in cooperation with the Government of Yukon, must manage the glaciation on the silver trail where flows from the Galkeno 300 in order to ensure icing does not affect the safe use of the trail.

**Replaced with:**

The proponent must manage the glaciation on the Silver Trail Highway, in cooperation with the Government of Yukon, where it flows from the Galkeno 300 in order to ensure icing does not affect the safe use and efficient maintenance of the Highway. Management shall include compensation to YG Highways for additional costs incurred beyond normal maintenance costs and identify long term solutions to permanently correct the hazard.

**Rationale:**

This recommendation has been varied at the request of Highways and Public Works.

**The following recommendation has been added with reasons provided:**

14. The proponent, in conjunction with Government of Yukon, develop a protocol dealing with the alteration or remediation of any historic site and for the removal of any historic objects, prior to undertaking any activities that may affect a historic site.

**Rationale:**  
This recommendation has been added at the request of the Cultural Services Branch of Yukon Tourism and Culture to acknowledge requirements of the Historic Resources Act.

**Dates**

<b>Project Recommendation Issued:</b> February 15, 2007	<b>Decision Document Issued:</b> March 9, 2007
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**Recommendation Received From**

Designated Office	<input checked="" type="checkbox"/>	Location: Mayo
Executive Committee	<input type="checkbox"/>	
Panel	<input type="checkbox"/>	a) Panel of the YESAB
	<input type="checkbox"/>	b) CEEA Panel
	<input type="checkbox"/>	c) Joint Panel (YESAB and other assessment body)

**Authority**

By signing below, the Yukon government has exercised its authority as per YESAA s. 75 or s. 76 to issue a decision document on this project.

Name: Marg Crombie                      Position: Director, Assessment and Abandoned Mines Branch

Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
Original signed by [Delegated YG Decision Body]

**Copies Forwarded to (as required by YESAA s. 81)):**

- Other Decision Bodies                      [list]\_\_\_\_\_
- Project Proponent                              ERDC\_\_\_\_\_
- DAP Branch, Executive Council Office      \_\_\_\_\_
- YESAB Designated Office                      Mayo\_\_\_\_\_
- YESAB Executive Committee                      [when applicable]\_\_\_\_\_
- Minister Environment (Canada)                      [when applicable]\_\_\_\_\_
- Yukon Surface Rights Board                      [when applicable]\_\_\_\_\_
- Yukon Water Board                              [when applicable]\_\_\_\_\_
- Land Use Planning Commission:                      [when applicable]\_\_\_\_\_
- Independent Regulatory Agency                      [when applicable]\_\_\_\_\_

Other Body/Person as Required

[list] \_\_\_\_\_