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July 8, 2010

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Mackenzie Valley Land and Water Board  
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*Sent by Email*

**RE: MV2009L8-0008 – Sediment and Erosion Control Plan**

As per Part D, Item 38 of the Water License MV2009L8-0008, INAC-CARD would like to provide this Incineration Management Plan of the Tundra Mine. If you have any questions or require additional information please do not hesitate to call me.

Regards,

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Indian and Northern Affairs Canada  
Contaminants and Remediation Directorate  
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# **Erosion, Sediment and Drainage Control Plan 2010**

**Prepared by**

**Aboriginal Engineering Limited**

**Wednesday July 8<sup>th</sup> 2010**



## ***Erosion, Sediment and Drainage Control Plan 2010***

**PROJECT ID:** *TUNDRA MINE PHASE 2 REMEDIATION*

**DATE OF RE-SUBMISSION:** July 7, 2010

**SUBMITTED BY:** Karen Lau (AEL)

**SUBMITTED TO:** Brad Thompson (PWGSC)

**CC.:** Bob Johnson (AEL), Jane Amphlett (INAC), Melanie Burgess (INAC)

### **1.0 INTRODUCTION**

Herein is contained the details of AEL's Erosion, Sediment and Drainage Control Plan for the Tundra Mine Phase 2 Remediation Project. This plan is designed specifically for the 2010 summer construction season, where only water treatment work is expected to occur. A more in depth plan will be developed when major earthworks and hydrocarbon excavation work commences.

### **2.0 REVISION LIST**

The following table tracks the process of Erosion, Sediment and Drainage Control Plan revision and ensures that all stakeholders have the most up to date copy. The table must be updated each time a revision is made to the document.

**Figure 1 Plan Revision Table**

REVISION NO.	AEL REVIEW	DATE	CROWN REVIEW	DATE	SECTIONS REVISED	COMMENTS	REVISION DISTRIBUTION DATE
1	BOB JOHNSON	July 1, 2010					
2			INAC	July 2 <sup>nd</sup> , 2010			
3	REUBEN MAKOHO NIUK	July 7, 2010			1.4 Acts Regulations and Guidelines 1.10 Contingency Plans		July 7, 2010



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## ➤ Erosion, Sediment and Drainage Control Plan

### 1.1 Potential Issues

The following scenarios are possible risks of impacts to Erosion, Sediment and Drainage on this project:

- Rain Fall
- Breach of Pumping System;
- Erosion at Discharge Location at Hambone Lake;
- Erosion along the discharge path to Whale Tail Lake
- High Winds;
- Erosion at Upper or Lower Pond Dams

### 1.2 Roles and Responsibilities

The following outlines the roles and responsibilities of employees with respect to the Response to Erosion, Sediment and Drainage Concerns.

**Table 1 Roles and Responsibilities for Response to Erosion, Sediment, and Drainage Concerns**

POSITION	RESPONSIBILITY
Project Manager	Preparing Plan to control Erosion, Sediment and Drainage Protection and ensuring the necessary resources are available to efficiently implement the plan.
Site Superintendent	Implementing and monitor the Erosion, Sediment and Drainage Protection Plan at site when required (i.e., Primary Designate)
	Ensuring that monitoring inspections are conducted.
	Shut Down pumping as required to should issues arise.
	Consult with PM for mitigation measures in response to potential issues.
Site Engineer	Maintain communications with PM to ensure monitoring and responses are appropriate.
	Implementing and monitor the Erosion, Sediment and Drainage Protection Plan at site when required (i.e., Secondary Designate)
Site Team Members	Write weekly Erosion Report for submittal
	Monitor for Erosion, channel Flow around Upper/Lower Pond and along the pumping channel and discharge location.
	Inform the superintendent to shut down pumping if required, and implement.

### 1.3 Training

Employees will be trained to inspect the site with the Superintendent and Field Engineer. The team members will be trained in the following:

- Measure the water level of Upper/Lower pond, if required
- Continuously monitor the intake and discharge lines for breaks, leaks and other malfunctions



- Be aware of the INAC Surveillance Monitoring Program and Monitoring Station Locations
- Monitor the discharge at Hambone Lake to ensure water is dissipating at a non-erosive velocity

Employees will be instructed to alert the superintendent immediately should a situation require pumping shut down.

### **1.4 Acts, Regulation and Guidelines**

The Erosion, Sediment and Channel Protection Plan has been developed in accordance with:

- requirements set forth in the Water License,
- Specification put forward by PWGSC for this project.

For additional information, please reference INAC’s monitoring plan, “Development of Tundra Mine Construction Monitoring, Long Term Monitoring, and Status of the Environment Programs”. This report will provide data from additional monitoring work, including tests for turbidity, TSS and TDS at various locations during the discharge.

### **1.5 Environmental Protection Supplies**

There will be silt fence on-site as an environmental protection supply in the event that we will require it to prevent/minimize impact of sedimentation and siltation to water bodies.

### **1.6 Emergency Numbers**

The following is the applicable list of emergency numbers for wildlife response:

**Table 2 Overall List of Emergency Numbers**

Name	Position	CONTACT #	ORGANIZATION
<b>PROJECT MANAGEMENT</b>			
<b>Brad Thompson</b>	Project Manager	Ph: 780-497-3862 Cell: 780-918-6277 Fax: 780-497-3842	Public Works and Government Services Canada
<b>Jane Amphlett</b>	Project Manager	Ph: 867-669-2773 Fax: 867-669-2721	Indian and Northern Affairs Canada
<b>Melanie Burgess</b>	Project Officer	Ph: 867-669-2566 Fax: 867-669-2721	Indian and Northern Affairs Canada
<b>TBA</b>	Departmental Representative	Ph: TBA	TBA
<b>Robert Johnson</b>	Project Manager	Ph. (867) 669.9481 Cell: (867) 445-4523 Fax (867) 669.9482	TLICHO
<b>Peter Stenne</b>	Site Superintendent	Site Ph: TBA Office Ph: (867) 669.9481	TLICHO
<b>John Mackenzie</b>	Health & Safety	Ph. (867) 920-7288	TLICHO



Name	Position	CONTACT #	ORGANIZATION
	Manager	Cell: (867) 446-0452 Fax (867) 920-7328	
<b>TBA</b>	Health & Safety Officer/Medic	Site Ph: TBA	TLICHO
<b>Karen Lau</b>	Field Engineer	Site Ph: TBA Office Ph: (867) 669.9481	TLICHO
<b>OCCUPATIONAL HEALTH AND SAFETY</b>			
<b>Peter Bengts</b>	Chief Inspector of Mines	(867) 669 4412	NWT Workers Compensation Board – Mine Safety
<b>WORKERS' COMPENSATION BOARD</b>			
<b>WCB Accident-Incident Reporting</b>	WCB	Ph. 1-800-661-0792 Fax: 1-866-277-3677	Workers Compensation Board

### ***1.7 Upper/Lower Pond***

The water level at Upper and Lower Pond will be monitored and recorded. There will also be weekly inspections along the Dam roads to look for rutting, cracking, or any other signs of degradation. If there is heavy rainfall, the Superintendent will inspect the Dam roads prior to heavy equipment travel on it.

All events will be reported to the Departmental Representative on a regular basis.

### ***1.8 Intake and Discharge Lines***

The field team will conduct a full inspection of the intake and discharge lines at least once every 3 hours. There will be spare parts (valves, lines, etc) in the event that repairs are needed. If major repairs are needed, parts of the water treatment plant, intake, or discharge lines will be shut down. The superintendent or field engineer will decide when this is necessary. All crew will be trained to shut off the intake and discharge pumps. Only Water Treatment Plant Operators will be allowed to perform any actions on the Water Treatment Plant.

A large water catchment area will be put in place to catch the water flowing out of the geotubes. This will allow the discharge pump to continually pump the treated water at a low velocity to prevent breakage in the discharge lines. It will also allow for the discharge pump to be shut down in the event that a discharge line does have to be replaced.

A backup 6 inch pump will also be on-site for emergency situations.

### ***1.9 Discharge at Hambone Lake***

In the 2009 season, discharge at Hambone Lake was at 150m<sup>3</sup>/hour. There was no visual erosion impact, nor did it increase water levels at downstream locations for the duration of the water treatment season. As the discharge rate has increased to 275m<sup>3</sup>/hour this season, we are planning to split out the discharge into two locations to mitigate against



erosion at Hambone Lake. We would like to put one discharge line at the same location as last year – which was at an outcrop of fractured rock in the wetlands draining into Hambone Lake. We will find another appropriate fractured rock pile in the wetlands for the second discharge location. By discharging at an outcrop in the wetlands prior to Hambone Lake, it will have the following advantages:

- maximize energy dissipation prior to entering the wetland and maximize the filtration through the wetland prior to entering Hambone Lake.
- The rock acts as a water diffuser so when the discharge water reaches the wetland, the velocity is tranquil and the flow has been reduced to laminar with little to no erosive force.
- Longer water lines require a higher pressure to move the water. By reducing the length of the line, the pressure will reduce, which will minimize and mitigate against line blowouts along the discharge.

This rock outcrop wetland location was chosen last year and did not have any visual erosion impact, nor did it increase water levels at downstream locations for the duration of the water treatment season; therefore, we would like to use this location again this year. Below is a picture from last treatment season of the discharge location at Hambone Lake.





## **1.10 Contingency Plans**

AEL has identified various potential issues with respect to erosion control. There will be ongoing monitoring to ensure that the outflow at Hambone Lake is not causing erosion. If this monitoring program detects erosion, AEL has several options to mitigate these effects:

- Reduce treatment rate and therefore, the discharge rate
- Reduce the outflow from the discharge lines by adding an additional discharge line at a new location at Hambone Lake
- Relocate the second discharge line to outflow directly into Hambone Lake, utilizing silt fences in order to block the migration of silt down the outflow pathway

Furthermore, AEL has also identified potential problems that might arise with respect to equipment failure. Contingency plans for these events include:

- Increasing the catchment area after the geotubes in case something happens to the discharge lines or pumps; this will allow time for water to build up while lines or the pump are replaced
- A back up pump will be located at the catchment area
- Spare parts for pipe lines and connections will be available on site
- Regular maintenance and inspection of lines and connections will be made