



**Independent Environmental
Monitoring Agency**

AQUATIC EFFECTS MONITORING PROGRAM

**Kugluktuk, NU Community Presentation
August 24th, 2004**

Topics of Discussion

- **What is the Aquatic Effects Monitoring Program (AEMP)**
- **Findings of the AEMP**
- **Agency comments**
- **Open discussion**

What is the AEMP?

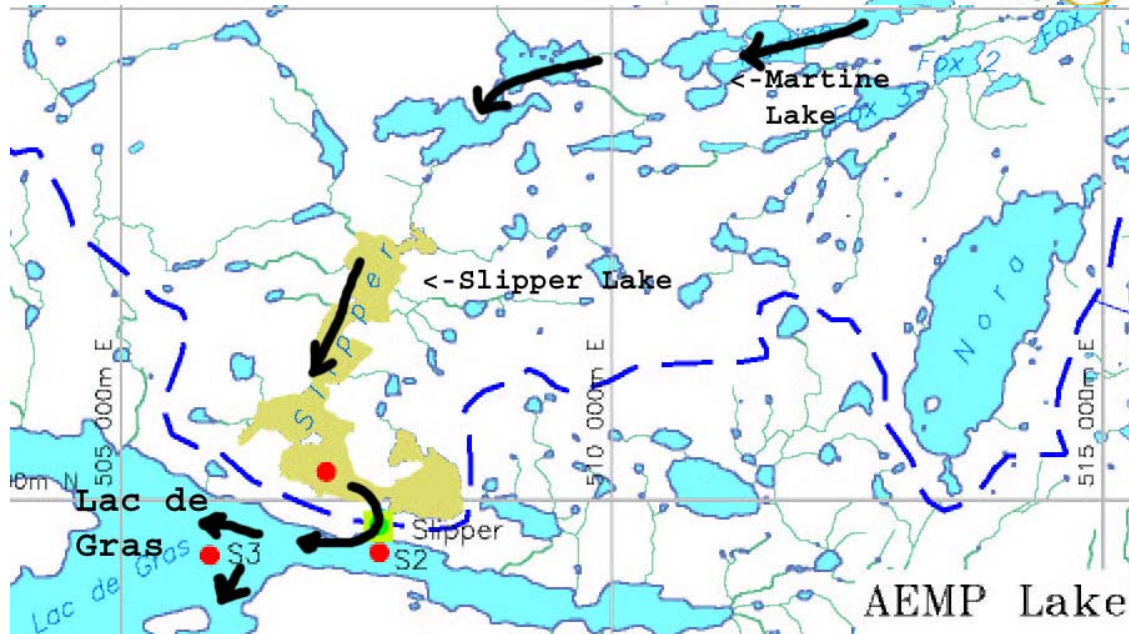
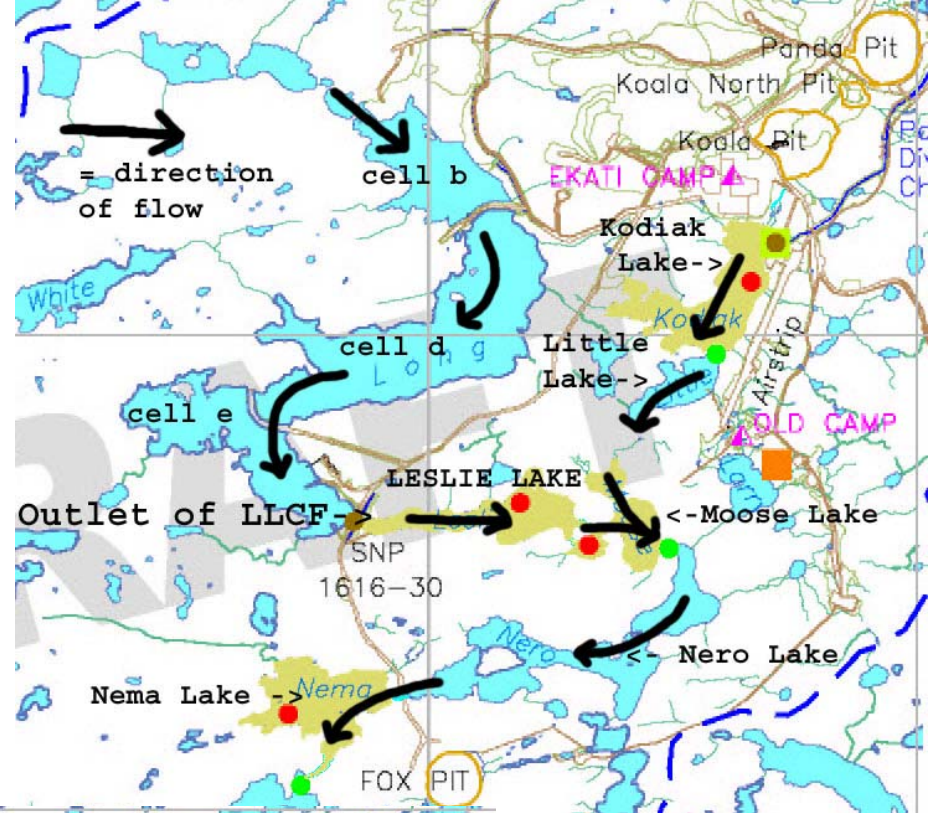
- Monitors water, fish and small plants and bugs to see if they are being affected by the mine
- Information used to determine if changes have happened downstream of the mine

What Watersheds are Monitored by the AEMP?

- Two main watersheds are currently monitored
 - The Koala Watershed (the Main mine)
 - The King-Cujo Watershed (the Misery mine)

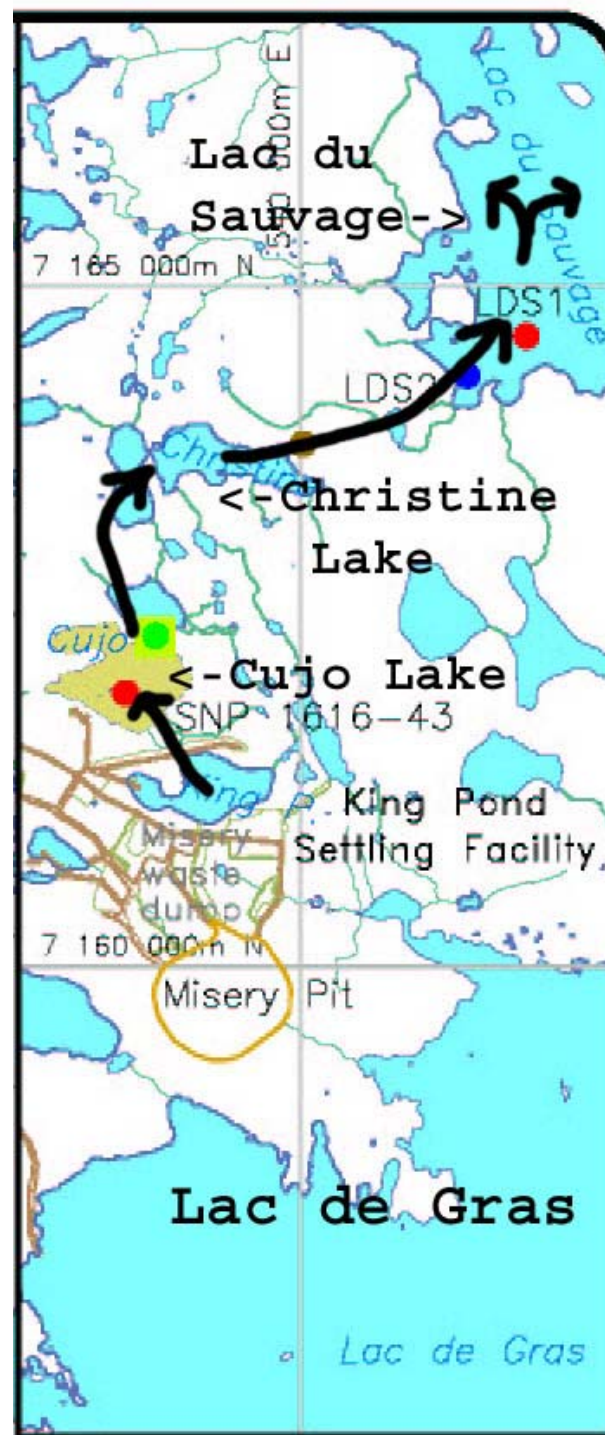
What lakes are immediately downstream of Ekati in the Koala Watershed?

Leslie, Moose, Kodiak, Little, Nero, Nema, Martine, Slipper, Lac de Gras



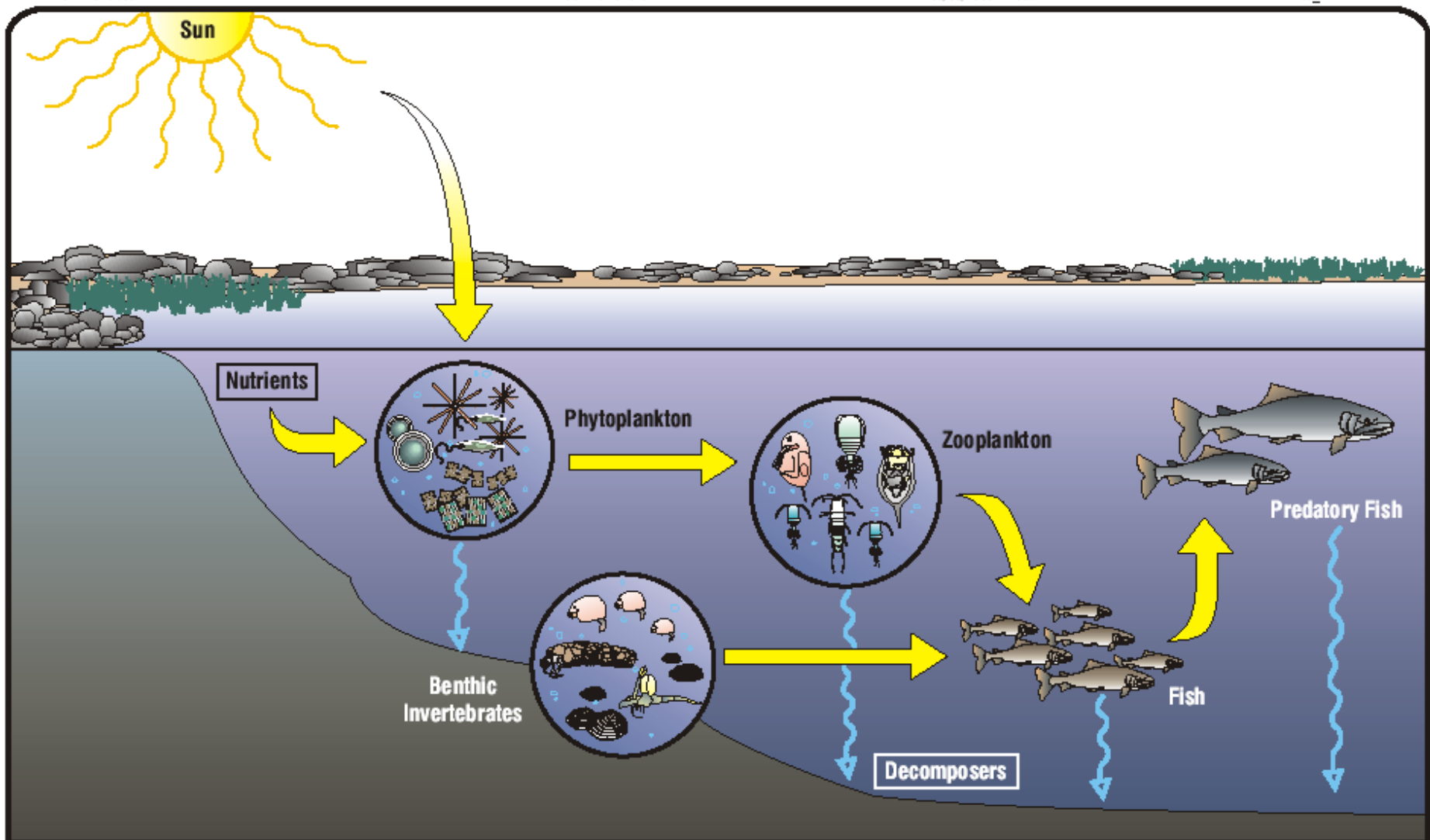
What lakes are immediately downstream of Misery Pit in the King Cujo Watershed?

King, Cujo, Christine,
Lac du Sauvage, Lac
de Gras



Outline of Studies

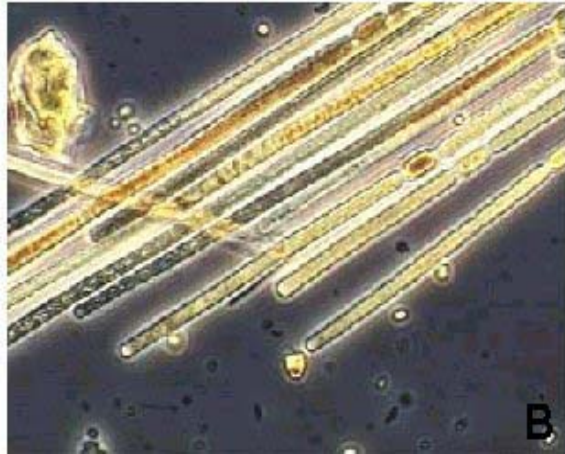
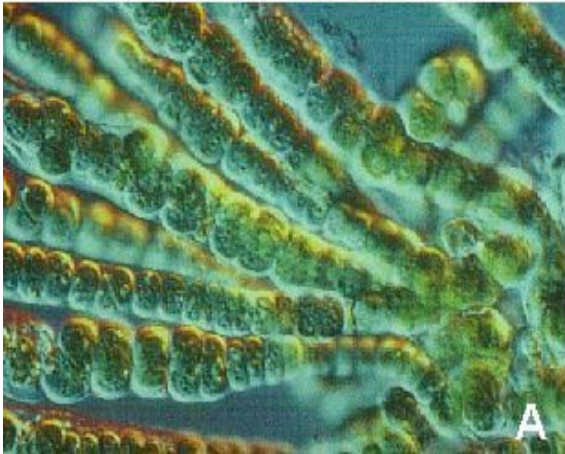
- **Water and aquatic life sampled annually**
- **Sediment quality sampled (every 3 years) and fish sampled (every 5 years)**
- **Animal plankton and plant plankton are monitored in August**
- **Winter sampling occurs under ice in April**



Animal Plankton



Plant Plankton



Zooplankton numbers in Moose Lake are changing

Photo: A magnified
image of the
Cladocera, Daphnia



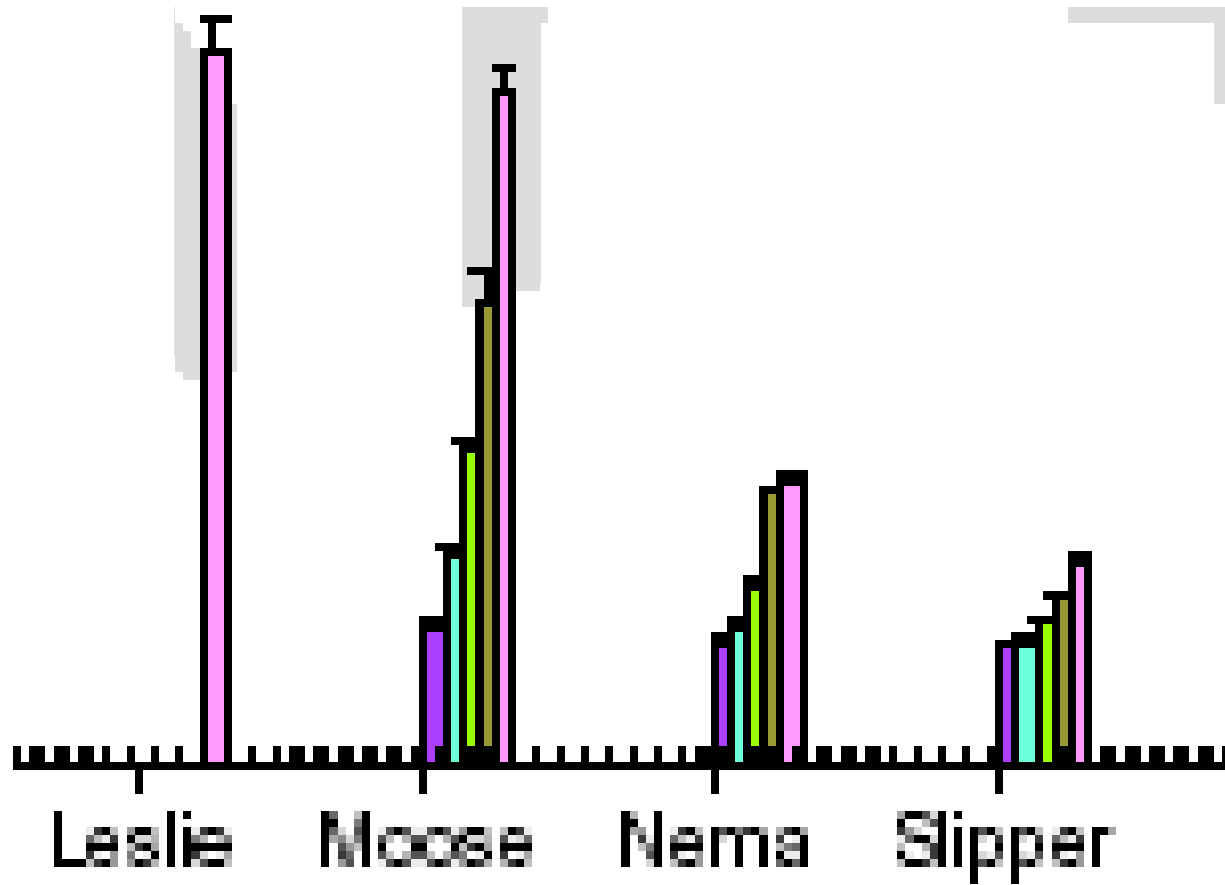
How Clean is the Water when it leaves Long Lake Containment Facility (LLCF)?

- Water discharged must meet levels outlined in the water licences and not harm aquatic life
- Water to be discharged from the new pits must meet stricter levels in the new water licence

What Contaminants have been found in the Water?

- A variety of nutrients, metals and ions have been identified downstream of Ekati
- These contaminants are found in low amounts and have not caused harm to the fish
- Generally the levels of contaminants decrease as you move farther downstream from the mine

Levels of contaminants decline downstream of Ekati but increase with every year



Downstream Direction Away from the LLCF →

How high are the levels of the contaminants?

- Past results show that contaminant levels are within CCME guidelines for the protection of aquatic life
- While trends for several contaminants have been increasing, levels generally remain within BHPB's predictions and water licence limits

Has Lac de Gras been affected by Ekati

- Lac de Gras had not been affected by Ekati operations through to 2002
- Changes have been measured downstream of Ekati as far as Slipper Lake
- Trace amount of a metal (molybdenum) detected in Lac de Gras in 2003, BHPB is investigating the source

Koala Watershed Effects in 2003

- 5 water quality parameters were elevated through to Slipper Lake as a result of project activities.
 - pH
 - Sulphate
 - Total Dissolved Solids
 - Potassium
 - Total Molybdenum
- Of these, only pH and sulphate were elevated in Lac de Gras as a result of project activities

King-Cujo Watershed Effects

- 8 water quality parameters elevated downstream of Misery pit as a result of project activities
- Of the 8 elevated parameters only sulphate and potassium reached the stream (Christine-Lac du Sauvage) emptying into Lac du Sauvage.

What has been found in past years?

- Small changes have been found in water quality and the fish and plants
- Most of these changes were predicted prior to the approval of the mine
- BHPB has changed its mining practices to help protect the water and fish
- The chemicals used to settle the water may be harmful to water bugs

Agency Comments

- Good to see some improvement in zooplankton diversity and cladocera abundance in Moose L in 2003.
- Presence of cladocera in the lower cells of LLCF is encouraging as well.
- We look forward to continued monitoring of these in Leslie & Moose Lakes in 2004.