

Aquatic Habitat and Aquatic Organisms Session

Afternoon

- ◆ Snap Lake Levels
- ◆ Phytoplankton Community Shifts
- ◆ Dissolved Oxygen Levels
- ◆ Small Lake Habitat

Small Lake Habitat Criteria

◆ Purpose:

- to clarify the criteria used to evaluate fish habitat potential in small lakes and streams within or near the project footprint

Topic Has Been Addressed:

- ◆ Environmental Assessment Report
 - Section 9.5.2.1
 - Appendix IX.9
 - Appendix IX.12
- ◆ Responses to Information Requests
 - IRs 2.1.1, 3.10.12, 3.10.14, 3.10.16, 4.11.12, 4.11.14

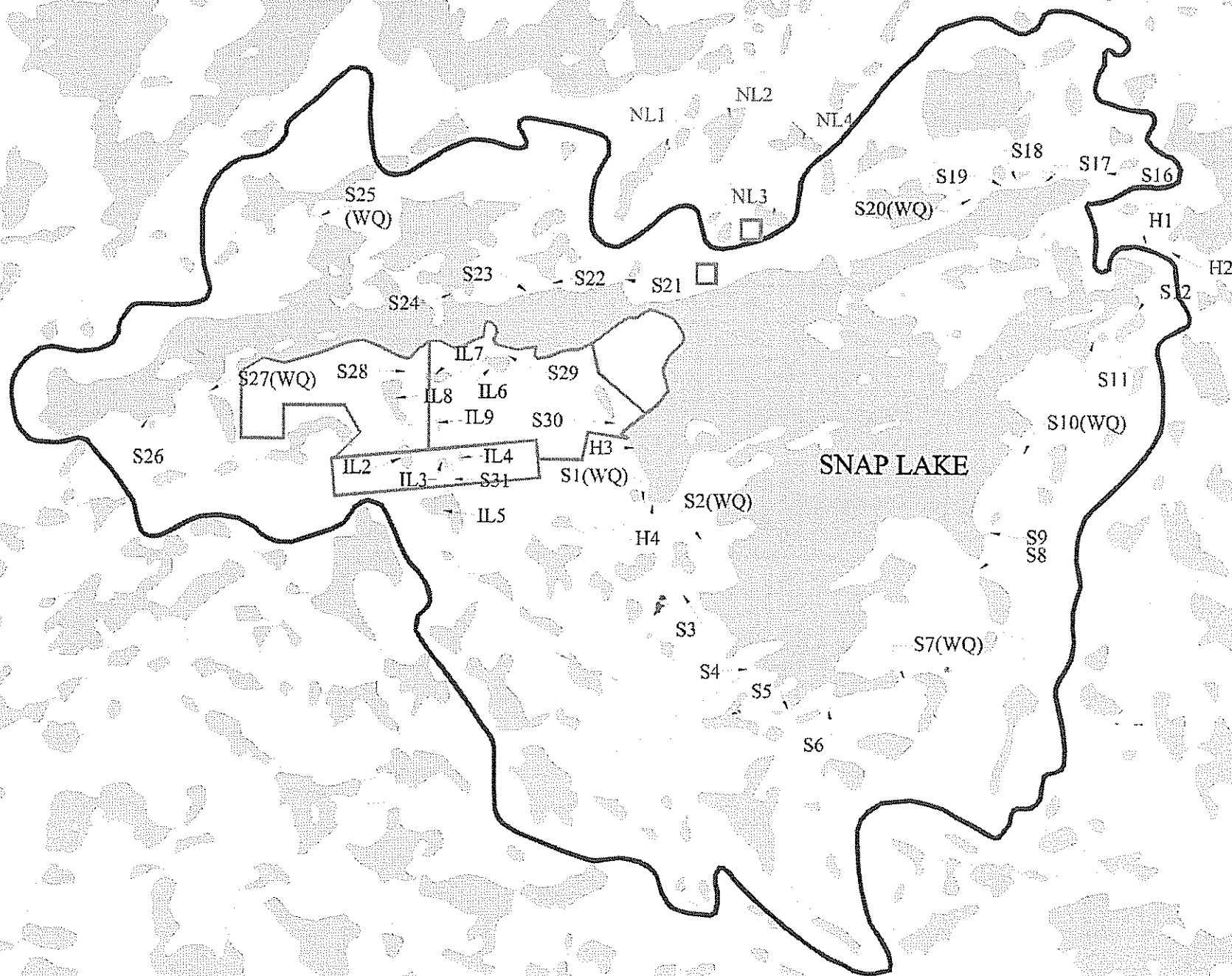
Small Lake Habitat Criteria

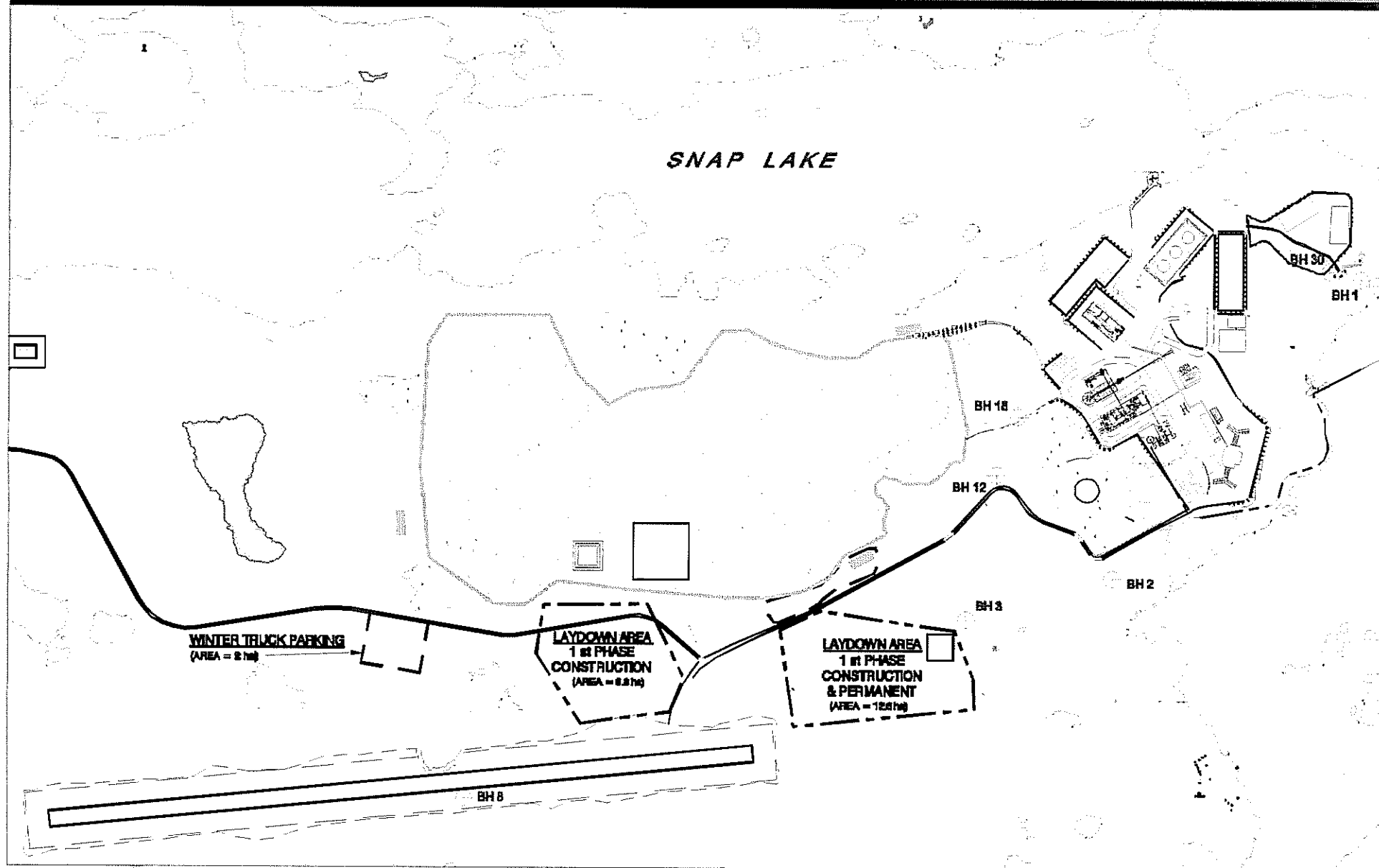
◆ Impact Assessment Process:

- **Step 1:** Establish habitat criteria for small lakes and streams
- **Step 2:** Determine which lakes have the potential to be directly or indirectly affected by the project
- **Step 3:** Assess the habitat of the lakes chosen
- **Step 4:** Compare habitat features of lakes with habitat criteria

Small Lake Habitat Criteria

- ◆ Potentially affected water bodies included water bodies:
 - Directly affected by infrastructure (sedimentation ponds, water management pond)
 - Located within a sub-basin with infrastructure resulting in run-off alteration
 - In close proximity to mine activity





Small Lake Habitat Criteria

- ◆ Water body depth
 - <2 m – no overwintering potential
 - 2 to 3 m – marginal overwintering potential
 - > 4 m – overwintering available
- ◆ Connectivity to other water bodies
 - Is there a passable channel?
 - How persistent is the channel?
- ◆ Observation or capture of fish

Small Stream Habitat Criteria

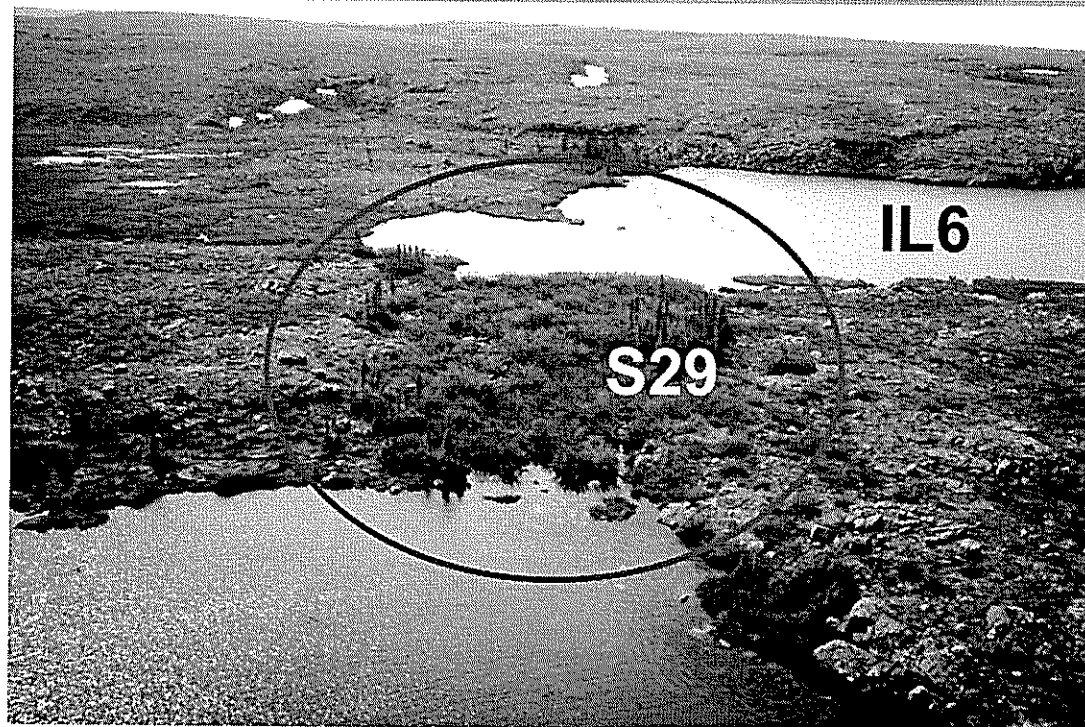
- ◆ Physical characteristics of the flow path
 - Is there a channel?
 - Observations of depth, width, and obstructions
- ◆ Sub-basin size
 - What is the expected flow pattern for a stream in this basin (seasonal flow duration and volume of flow)?

Small Lake Example: IL6

- ◆ Is the lake potentially affected? Yes, as a sedimentation pond
- ◆ Habitat Evaluation:
 - Maximum depth is 2.5 m, 2.88 ha in size
 - Ephemeral flow to Snap Lake – no access
 - No fish captured or observed
- ◆ Evaluation effort:
 - Fished using minnow traps and gill nets in 1999, 2001
 - Habitat assessed in spring and summer 1999, summer 2001, and spring 2002 – on-the-ground surveys



Small Stream Example: S29 (Between IL6 and Snap Lake)



- ◆ No defined or visible stream channel, dispersed flow through vegetated terrain, areas of completely sub-surface flow
- ◆ No access for fish, no migration corridor to other habitat
- ◆ Located in sub-basin "O" with an area of 0.89 km², run-off conditions expected to be short-term spring flow (approximately 1-2 week duration)

Conclusions

- ◆ Criteria were established to determine the fish-bearing status of small lakes
- ◆ Lakes that will be affected by the project footprint were determined to be non-fish bearing
- ◆ Contribution of non-fish bearing lakes to Snap Lake fishery were evaluated as negligible due to very low, seasonal and dispersed flows

Dissolved Oxygen in Snap Lake

◆ Purpose:

- to determine whether a reduction of dissolved oxygen of 1-2 mg/L could impact fish and fish habitat

Topic Has Been Addressed

- ◆ Environmental Assessment Report
 - Section 9.4.2.2.4
- ◆ Responses to Information Requests
 - IR 2.1.6
 - IR 3.4.6

Dissolved Oxygen Concentrations – Snap Lake

- ◆ Dissolved oxygen (DO) levels in Snap Lake in winter remain high near surface and decline with depth
- ◆ A gradual decline in DO levels in lakes over the winter period is common

Dissolved Oxygen - Predicted

- ◆ Worst case prediction for DO in Snap Lake is a decrease to 3 mg/L
- ◆ CCME guideline is 5.5 mg/L
- ◆ This would occur in the deepest holes
- ◆ Effect would be limited to late winter
- ◆ Overall impact to aquatic community would be low since exposure to reduced DO would occur over a limited area and over a limited time