Appendix V5-6E

Hope Bay Belt Project: 2010 Freshwater Fish and Fish Habitat Baseline Report

Hope Bay Mining Limited

HOPE BAY BELT PROJECT
2010 Freshwater Fish and Fish Habitat Baseline Report

NEWMONT™
NORTH AMERICA

Rescan™ Environmental Services Ltd.
Rescan Building, Sixth Floor - 1111 West Hastings Street
Vancouver, BC Canada V6E 2J3
Tel: (604) 689-9460 Fax: (604) 687-4277

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HOPE BAY BELT PROJECT

2010 FRESHWATER FISH AND FISH HABITAT BASELINE REPORT

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NEWMONT™
NORTH AMERICA

Hope Bay Mining Limited

Prepared by:

Rescan™
Engineers and Scientists

Rescan™ Environmental Services Ltd.
Vancouver, British Columbia

Executive Summary

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Executive Summary

Environmental baseline studies were conducted by Rescan Environmental Services Ltd. (Rescan) on behalf of Hope Bay Mining Ltd. (HBML) at the Hope Bay Belt Project in 2010. The Hope Bay Belt property is located approximately 125 km southwest of Cambridge Bay, Nunavut, on the southern shore of Melville Sound.

This report presents the results from the Freshwater Fish and Fish Habitat portion of the 2010 Phase 2 environmental baseline program.

The primary objective of the 2010 freshwater fish and fish habitat baseline work was to characterize fish habitat and fish communities in the Project area. Specific objectives of the 2010 program were to:

1. Characterize fish habitat and fish communities in lakes, ponds, rivers and streams of the Phase 2 Project area, including those water bodies potentially affected by mine development and reference areas outside the Project area.
2. Describe the type of lake habitat (i.e., substrate or bottom type) near the proposed Ore Deposit site and a reference site in Aimaokatalok Lake.
3. Estimate the population number (with 95% confidence intervals) and spatial distributions of lake trout in the Ore Deposit and reference areas in Aimaokatalok Lake.
4. Determine the type, quantity and rating of stream habitat found along road alignments and within proposed waste rock and tailings management areas in the Phase 2 Project area.

Fish habitat was defined as those environmental components that are required either directly or indirectly by fish to carry out their life processes, including spawning and rearing areas, food production areas, migration routes and over-wintering areas. These areas included lakes, ponds, rivers and streams. The fish communities were defined in terms of total number and number-by-species at each sampling location, total catch-per-unit-effort (CPUE) and species-specific CPUE for each type of assessment gear. Biological features of fish such as length, weight, condition, age and diet were also measured. Lake trout (*Salvelinus namaycush*) tissue metal concentrations were evaluated at Aimaokatalok Lake and Reference Lake D. Ninespine stickleback (*Pungitius pungitius*) tissue metal concentrations were evaluated at 5 streams within the Phase 2 Project Area. Hydroacoustic methods were also used to estimate absolute fish abundance and evaluate fish habitat in Aimaokatalok Lake.

Studies of fish habitat found that fines were the predominant substrate in streams that could be influenced by project development, while cobble and boulder substrates were most prevalent in streams outside the project area. Large rivers and lake outlet streams supplied good quality habitat for fish. Ninespine stickleback and Arctic grayling (*Thymallus arcticus*) were the predominant species captured from streams. Ponds and small, ephemeral streams assessed were generally non-fish-bearing and rated as poor habitat quality. Hydroacoustic studies of Aimaokatalok Lake indicated that the area adjacent to the ore deposit area was dominated by soft fines and mud, while the reference site in the northern section of the lake was dominated by cobble and boulder.

The fish communities of lake, river, stream and pond habitats were also assessed. The fish communities of lakes were assessed using gillnets and/or hydroacoustic gear. Large river sites were assessed with a combination of gillnets, minnow traps and electrofishing gear. The fish community of stream sites was primarily assessed using backpack electrofishing gear. Fish communities displayed very low species

richness. A total of eight species were identified in freshwater environments, including Arctic char (*Salvelinus alpinus*), Arctic grayling, burbot (*Lota lota*), cisco (*Coregonus artedi*), lake trout, lake whitefish (*Coregonus clupeaformis*), ninespine stickleback and slimy sculpin (*Cottus cognatus*). Lake trout, lake whitefish and ninespine stickleback represented the majority of fish captured.

Hydroacoustic gear was used to estimate fish density at the Ore Deposit area and the Reference Area in Aimaokatalok Lake. Results from the hydroacoustic surveys indicated that the overall mean density of fish in the ore deposit area was 12 fish/ha. The overall mean density of fish in the reference area was 48 fish/ha. The highest fish densities were observed in the southwest portion of the reference area in 10 to 15 m of water, and the highest densities in the ore deposit area were observed along the western shoreline of the study area. Fish densities ranged from 0 to 935 fish/ha in the ore deposit area, while densities in the Reference area ranged from 0 to 1,026 fish/ha. Concentrations of fish were typically associated with deep water habitat (e.g., 10 to 15 m) with lake cisco were found in higher proportions at these depths.

Taxonomic analysis of stomach contents was conducted on lake trout and lake whitefish. Lake trout were primarily piscivorous, while lake whitefish mainly fed on mysid crustaceans. Lake trout muscle and liver tissue samples were analysed for total metal concentrations from Aimaokatalok Lake and Reference Lake D. In Aimaokatalok Lake, lake trout had mean concentrations above the Health Canada guideline for mercury in both muscle and liver tissue. In Reference Lake D, all lake trout samples, both muscle and liver, had concentrations below the Health Canada guideline for mercury. Whole body samples of ninespine stickleback from streams that could potentially be influenced by mine development were also analysed for total metal concentrations. All ninespine stickleback samples had concentrations below the Health Canada guideline for mercury.

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1. Introduction

The Hope Bay Belt Property is located approximately 125 km southwest of Cambridge Bay, Nunavut, on the south shore of Melville Sound (Figure 1-1). The nearest communities are Omingmaktok (75 km to the southwest of the property), Cambridge Bay, and Kingaok (Bathurst Inlet; 160 km to the southwest of the property).

The property consists of a greenstone belt running in a north/south direction, approximately 80 km long, with 3 main gold deposit areas. The Doris and Madrid deposits are located in the northern portion of the belt, and the Boston deposit is located in the southern end. The northern portion of the property consists of several watershed systems that drain into Roberts Bay, and a large river (Koignuk River) that drains into Hope Bay. Watersheds in the southern portion of the belt ultimately drain into the upper Koignuk, which drains into Hope Bay.

Hope Bay Mining Limited (HBML) is proceeding with the development of the Doris North Project. Required licences and permits are in place for the development of the Doris North Gold Mine, and construction of the project commenced in 2010.

HBML plans to develop additional deposits in the belt, and planning for this Phase 2 Project development has commenced. Baseline studies to support the permitting of the Phase 2 Project were carried out in 2009, and were continued in 2010. The environmental baseline program conducted in 2010 was intended to fill in information gaps in order to support the permitting process for the Phase 2 Project. The site layout options considered for the 2010 Phase 2 environmental baseline program are shown in Figure 1-2.

Results from the 2010 Phase 2 Project environmental baseline program are being reported in a series of reports, as follows:

- 2010 Hydrology Baseline Report
- 2010 Freshwater Baseline Report
- 2010 Freshwater Fish and Fish Habitat Baseline Report
- 2010 Marine Baseline Report
- 2010 Marine Fish and Fish Habitat Baseline Report
- 2010 Terrain and Soils Baseline Report
- 2010 Country Foods Baseline Report
- 2010 Ecosystems and Vegetation Baseline Report
- 2010 Marine Wildlife Baseline Report

In addition, numerous reports are being produced as part of the Doris North Project compliance requirements, and many of these reports cover the geographical areas of the proposed Phase 2 Project. Examples of Doris North Project compliance reports generated in 2010 that are relevant to the proposed Phase 2 Project include:

- 2010 Meteorology Compliance Report, Doris North Project

Figure 1-1

Hope Bay Belt Project Location

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