Appendix V5-1G

Hope Bay Belt Project: 2011 Hydrology Baseline Report

MAC RESOURCES

Hope Bay Mining Limited

HOPE BAY BELT PROJECT
2011 Hydrology Baseline Report

NEWMONT™
NORTH AMERICA




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HOPE BAY BELT PROJECT
2011 HYDROLOGY BASELINE REPORT

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Prepared for:

NEWMONT NORTH AMERICA

Hope Bay Mining Limited

Prepared by:

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Executive Summary

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Executive Summary

The Hope Bay Belt Property is located approximately 125 km southwest of Cambridge Bay, Nunavut, on the south shore of Melville Sound. The property consists of a greenstone belt running in a north/south direction. The belt is approximately 80 km long, with three main gold deposit areas. The Doris and Madrid deposits are located in the north end of the belt and the Boston deposit is located in the south end of the belt.

The potential Phase 2 Project involves developing deposits in the Madrid and Boston areas and includes a proposed all-weather road connecting the north and south areas of the belt. Rescan Environmental Services Ltd. (Rescan) was contracted by Hope Bay Mining Ltd. (HBML) to carry out baseline studies to support the permitting of the Phase 2 Project in 2011.

This report presents the findings of the 2011 hydrology baseline study. The objective of the 2011 hydrology program was to collect additional hydrometric data to support permitting of the Phase 2 Project. This report presents the methods used to collect and analyze hydrometric data for 2011 as well as the results obtained for the basins located within the Doris/Madrid and the Boston areas. The report also includes a comparison of the 2011 results to on-site historical data and regional data.

A network of 19 hydrometric monitoring stations within the belt was operated during 2011. In the Doris/Madrid area, 10 hydrometric monitoring stations were remobilized, one new station was installed, and two existing lake level stations were maintained. In the Boston area five hydrometric monitoring stations were remobilized and one new station was installed.

The 2011 open water period extended from early-June until mid-November. In 2011, runoff estimates for drainage basins located within the belt varied. The estimated mean annual runoff was 185 mm for basins in the Doris/Madrid area and 158 mm for basins in the Boston area.

Hydrologic conditions in 2011 were wetter than the two previous monitoring years. The estimated 2011 annual runoff values were approximately 31% higher than in 2010. In terms of annual runoff, the mean estimate for the Doris/Madrid area exceeded the magnitude associated with a 1-in-100 year recurrence interval.

The timing of the annual peak flows varied among the monitored watersheds located within the Phase 2 Project Area. Two distinct high water events were observed at the stations located in the Doris/Madrid area. The first event occurred during the spring freshet period in mid-June and was largely driven by snowmelt. This event was the annual peak for stations Patch-Hydro, Ogama-Hydro, PO-Hydro, Reference-B-Hydro, and Koignuk-Hydro. The second event occurred in early July and was largely driven by 32 mm of rain that fell between June 30 and July 1. This event was the annual peak for stations TL2 (Doris Upstream), TL3 (Doris Downstream), and Roberts-Hydro. Annual peak flows in the Doris/Madrid area ranged from 2.53 m^3/s at Patch-Hydro to 299.5 m^3/s at Koignuk-Hydro. Two distinct high water events were also observed in the monitored basins located within the Boston area. However, unlike the basins in the Doris/Madrid area, the annual peak in the Boston area occurred during the freshet period in mid- to late-June and was driven by snowmelt. The annual peaks in the Boston area ranged from 0.51 m^3/s at Stickleback-Hydro to 95.41 m^3/s at Aimao In-Hydro. Peak flows in most of the drainage basins in the Phase 2 Project Area exceeded the magnitude of events associated with a 1-in-100 year recurrence interval.

Observed low flows for the drainage basins in the Doris/Madrid area occurred between early-to late-September and ranged from 0.084 m^3/s at PO-Hydro to 7.58 m^3/s at Koignuk-Hydro. The observed low flows for the drainage basins in the Boston area occurred in mid-August in most watersheds and ranged from below 0.01 m^3/s at the station East Tailings-Hydro to 3.29 m^3/s at Aimao Out-Hydro.

In the Doris/Madrid area, changes in lake water levels recorded from June 1 to October 3 ranged from 0.235 m at Windy Lake to 0.737 m at Doris Lake, respectively. In the Boston Area lake level variation for Aimaokatalok Lake was 2.46 m.

Tide levels were measured by a hydrometric station installed near the existing jetty located in the southern part of Roberts Bay from July 24 to September 28. The tides in Roberts Bay were microtidal (< 2 m tidal range) and semi-diurnal. Daily tide ranges were generally between 0.25 and 0.35 m (average: 0.30±0.07 m), with a maximum tidal range (the difference between high and low water in one tidal cycle) of 0.33 m on September 20, 2011 during the spring tide.

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Glossary and Abbreviations

Glossary and Abbreviations

Terminology used in this document is defined where it is first used. The following list will assist readers who may choose to review only portions of the document.

ADCP	Acoustic Doppler current profiler.
7-day low flow	The minimum average 7-day flow that occurs over a specified period, such as a month, season or year.
Active Layer	Surface layer of earth materials that thaws and refreezes on an annual basis.
Annual Runoff	Annual runoff is a measure of the hydrologic response of a watershed. It is often presented as a depth, in mm, over an entire watershed allowing direct comparison with precipitation totals.
Arctic-Nival	A hydrological region located in continuous permafrost regions where deep infiltration is impeded by perennially frozen ground, thus base flow and winter flow to rivers is low or non-existent.
Bankfull Stage/ Discharge	The stage or discharge of a watercourse in which the stream completely fills its channel and the elevation of the water surface coincides with the bank margins.
E	Estimated. Part of a system that assigns different grades to the data collected. In order of decreasing quality, the following grades are used: A, B, C, E (estimated), and U (unknown).
EC	Environment Canada
ESR	Environmental and Social Responsibility Department. Hope Bay Mining Limited.
FFA	Flood frequency analysis. Analytical technique that involves using observed annual peak flow discharge data to calculate statistical information such as mean values, standard deviations, skewness, and recurrence intervals. These statistical data are then used to construct frequency distributions, which indicate the likelihood of various discharges as a function of recurrence interval or exceedance probability.
Flood Frequency	The frequency that a flood of a specified magnitude occurs, inversely related to flood return period (see Return Period).
Freshet	In channels, the relatively high annual peak water discharge period resulting from spring/summer meltwater runoff of the snowpack accumulated over the winter.
HBML	Hope Bay Mining Limited
HSLP	HBML Health, Safety, and Loss Prevention Department
Hydrograph	A graphical plot of water discharge versus time.
ISO	International Organization for Standardization
MAD	Mean annual discharge
n/a	Not applicable

NAD	North American Datum. A datum is a reference system for computing or correlating the results of a survey. All Universal Transverse Mercator coordinates mentioned in this report are referenced to the NAD83 datum. This datum is based on the GRs80 spheroid.
Negative degree-day	The sum of average daily temperatures that are consecutively below a defined base temperature.
Permafrost	Rock or soil that remains below 0°C for at least two years.
QA/QC	Quality assurance and quality control
Qn (Q2, Q20, Q100, Q200)	The water discharge that is equalled or exceeded on average once every *n* years.
Rescan	Rescan Environmental Services Ltd.
Return Period	The average interval at which an event occurs, calculated from the probability of its occurrence in a given year.
Stage	The depth of water in a water course or channel
Stage Discharge Curve	A curve derived from concurrently measured stage and discharge data that is used to estimate the discharge for any given observed stage. Often referred to as a rating curve for a hydrometric station.
WSC	Water Survey of Canada
USGS	United States Geological Survey
UTM	Universal Transverse Mercator. A mathematical transformation (map projection) of the earth's surface to create a flat map sheet.

1. Introduction

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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 three 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 2010, and were continued in 2011. The environmental baseline program conducted in 2011 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 2011 Phase 2 environmental baseline program are shown in Figure 1-2.

Results from the 2011 Phase 2 Project environmental baseline program are being reported in a series of reports, as follows:

- 2011 Meteorology Baseline Report
- 2011 Hydrology Baseline Report
- 2011 Marine Wildlife Baseline Report
- 2011 Country Foods Baseline Report
- 2011 Socio-Economic and Land Use 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 2011 that are relevant to the proposed Phase 2 Project include:

- 2011 Meteorology Compliance Report, Doris North Project
- 2011 Hydrology Compliance Report, Doris North Project
- 2011 Wildlife Monitoring and Mitigation Report, Doris North Project
- 2011 Wildlife DNA Study, Doris North Project

Figure 1-1

Hope Bay Belt Project Location

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