

## **Appendix 8.0**

In Response to AANDC-NIRB #7: Hope Bay Stage 2  
Overburden Characterization Report



# Hope Bay Gold Project: Stage 2 Overburden Characterization Report

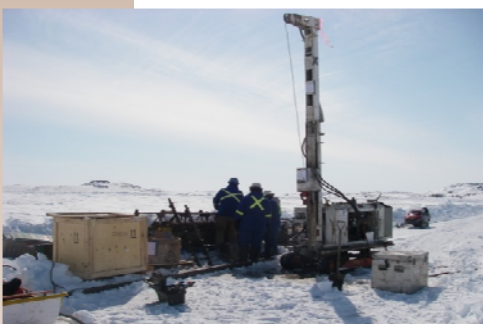
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Hope Bay, Nunavut, Canada

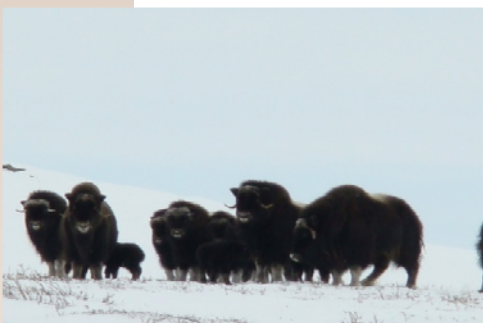


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SRK Project No. 1CH008.002

September 2009

# **Hope Bay Gold Project: Stage 2 Overburden Characterization Report, Nunavut, Canada**

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**SRK Project Number 1CH008.002**

**September 2009**

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### **External Reviewer**

Pete Stacey, STACEY Mining Geotechnical Ltd.

## Executive Summary

Hope Bay Mining Ltd. (HBML), a wholly owned subsidiary of Newmont Mining Corporation (NMC) is conducting a Stage 2 Study (Study) on their Hope Bay Gold Project (Project) in Nunavut, Canada. This Project includes three distinct mining areas, geographically separated along the north-south trending Hope Bay Greenstone Belt. At each of these mining areas, proposed development includes multiple potential open pits, underground operations, waste rock piles, tailings deposition sites, and other supporting mine infrastructure components. In all instances mining will be both onshore (i.e. on land) as well as offshore (i.e. extending into, or beneath Doris, Patch and Spyder Lakes).

An important part of completing the Study is characterization of overburden (soil) geotechnical conditions. This geotechnical data is required as input towards Stage 2 design of surface infrastructure elements, open pits, and potential dewatering dikes in Doris, Patch and Spyder Lakes, located at the Doris, Madrid and Boston mining areas respectively.

This report documents specific geotechnical field work completed during two seasons of data collection (winter of 2007 and 2008) in order to characterize overburden conditions both onshore and offshore. The report also provides a comprehensive summary of all previous overburden characterization work conducted at the site to demonstrate site-wide geotechnical consistency.

There is general agreement between overburden characterization data obtained from the Winter 2007 onshore geotechnical drill hole data at the Madrid mining area and historic onshore overburden characterization data at Doris and Boston mining areas. The general overburden profile consists of ice-rich (10 to 30% by volume on average, but occasionally as high as 50%) marine silty clay and clayey silt. The ice is most commonly found as interstitial ice or thin ice lenses (less than a few centimetres thick). The only area where massive ice (i.e. ice lenses greater than 1 m thick) has been observed is at the Madrid mining area, and even then it was only encountered in two drill holes. The area where this was observed is within the confines of the proposed Naartok open pit and represents a poorly drained area where typical permafrost patterned ground features are apparent.

The overburden profile consists of a thin veneer of hummocky organic soil covered by tundra heath vegetation. Typically this layer is poorly drained. Under this organic zone is a layer of marine clay (silty clay and clayey silt) typically between 5 and 20 m thick; however, since the terrain is glaciated with significant bedrock control, there are areas where overburden is less than 5 m thick as well as areas where the overburden exceeds 30 m in thickness. In areas where the overburden exceeds 20 m in thickness, it appears to be underlain by clayey morainal till, which contains moderate amounts of cobbles and boulders. The bedrock contact zone is easily recognized and typically consists of a relatively thin rubble zone of weathered blocky host rock.

With the exception of the occurrence of massive ice at the Madrid mining area, overburden conditions within the confines of the Doris North and Naartok pits are similar. At the Boston mining

area overburden soil conditions are similar in nature, although the overall thickness does appear to be slightly less, averaging less than about 10 m.

The overburden soils under Doris, Patch and Spyder Lakes are of the same origin as onshore overburden soils, i.e. silty clays and clayey silts. Preliminary data, based on deep thermistors installed beneath each of the lakes in question in 2008 (SRK 2009c, d, e), seem to suggest that each lake supports an open talik.

In all three lakes there is a layer of limnic sediments ranging between a few centimetres to as much as 2 m thick. The remainder of the profile consists of a normally consolidated layer of marine silty clay and clayey silts between 10 and 20 m thick at Doris and Patch Lakes. Beneath Spyder Lake, the layer of unconsolidated material is generally less than 10 m thick, and often cone refusal was encountered near surface, which according to site geologists are due to the presence of the bedrock contact zone which consists of boulder sized frost shattered bedrock fragments.

Beneath Patch Lake a sand layer, up to 3 m thick was encountered in about half of the test holes, at a depth of about 10 m below lake bed surface. Based on CPT data this layer appears to suggest that the marine clay underlying this layer is slightly more consolidated.

This report contains a summary of the most important overburden engineering properties from all available overburden characterization programs completed at the Hope Bay Belt. This summary is intended to be used in support of generalized design assumptions where site specific characterization data is not available.

The results presented in this report are sufficient for the Hope Bay Gold Project Stage 2 Study engineering designs. In order to improve the designs to a level of engineering that will satisfy a Stage 3 Study, specific overburden characterization data gaps will have to be addressed. These data gaps are identified in this report, complete with recommendations for further field characterizations work.

The report is concluded with an estimate of the total Professional fees associated with completing the recommended Stage 3 Study overburden characterization program. This includes costs associated with instrumentation (thermistors) and laboratory testing.

## PEER REVIEW FORM

**Subject:** PEER REVIEW OF **MINE ENGINEERING – GEOTECHNICAL & HYDROLOGY**

### **Introduction**

Project:	Hope Bay Project
Stage:	2
Function:	MIN.S2.150.10 - Geotechnical Program Development Open Pit MIN.S2.150.20 – Geotechnical Pit Slope Recommendations, MIN.S2.160.10 - Hydrogeology – Open Pit & Underground, MIN.S2.510.10 - Geotechnical Program Development Underground, MIN.S2.510.20 - Geotechnical Design Parameters Underground
Peer Reviewers:	Pete Stacey, STACEY Mining Geotechnical Limited
Date of Review:	Concurrent with Drilling, Design and Reporting in 2008 and 2009
Place of Review:	1384 Lawson Avenue, West Vancouver BC V7T 2E7 Canada phone 604.926.0999 fax 604.926.0095 patstacey@staceymgl.com

Other relevant background Information:

### **Review and Recommendations**

The following deliverables have been reviewed and **are of sufficient quality and content to pass the current gate requirements:**

The following deliverables are not complete. **The listed additional work must be completed before the project can pass the current gate:**

The following deliverables are substandard or of concern. The concern is not significant enough to stop the project at the gate, but should be addressed early in the next stage of work.

I have reviewed the Scope of Work for the next Stage and find it to be sufficient/insufficient. The following items should be added to or removed from the scope:

**Conclusions:**

**Document List (recommended)**

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