

Appendix V5-10B

2008 Roberts Bay Fisheries Authorization
Monitoring Report



2008 ROBERTS BAY FISHERIES AUTHORIZATION MONITORING REPORT

FINAL REPORT



Engineering Earth's Development, Preserving Earth's Integrity



**2008 ROBERTS BAY JETTY
FISHERIES AUTHORIZATION
MONITORING REPORT**

- FINAL REPORT-

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December 2008

08-1373-0026-8000

Cover Photo Notation: Looking west across the habitat compensation shoals before submersion of the shoals. Photo courtesy of SRK Consulting. 11 July 2008.

Suggested Citation: Golder Associates Ltd. 2008. 2008 Roberts Bay Fisheries Authorization Monitoring Report. Report prepared for Hope Bay Mining Ltd., North Vancouver, BC by Golder Associates Ltd., Edmonton, AB. Golder Report No. 08-1373-0026-8000: 35 p. + 2 app.

EXECUTIVE SUMMARY

The previous owner of Doris North Project, Miramar Hope Bay Ltd (MHBL) proposed to construct and operate a gold mine in the West Kitikmeot Region of Nunavut (NU) in 2005. The project area is located 685 km northeast of Yellowknife and 125 km southwest from Cambridge Bay, NU. As part of the infrastructure required to construct and operate the Doris North mine, MHBL constructed a jetty in Roberts Bay to accommodate barge shipments to the mine in 2007.

Transportation Canada and the Department of Fisheries and Oceans (DFO) authorized construction of the jetty in June 2007. The DFO authorization for works or undertakings affecting fish habitat requires the implementation of a sediment transportation and deposition monitoring program, a photographic record of construction activities, and implementation of a fish habitat compensation plan. This report addresses these conditions of the DFO authorization.

MHBL was purchased by Hope Bay Mining Ltd (HBML), a wholly owned affiliate of the Newmont Mining Corporation in December of 2007. HBML has assumed MHBL's Fisheries Authorization and its obligations.

This document is submitted as part of the obligations under Section 5 of the Authorization for Works or Undertakings Affecting Fish Habitat – Conditions related to Monitoring. These obligations include the following:

5.1 The approved monitoring plan shall be implemented in the following years: 2008 (deferred), 2009, the year prior to mine construction, year of mine construction, year-2 of mine operation, year-2 of active post-mine closure (i.e., year prior to jetty lowering below high water level), year-1 post-lowering of jetty and year-2 post-lowering of jetty. The detailed monitoring plan shall include, but not be limited to, the following:

5.1.1 The stability and successful utilization of all compensation features shall be assessed according to the schedule in 5.1 above.

5.1.2 If at any time during the monitoring period, compensation features are not functioning as intended, measures shall be identified to reduce the risk of future failure and additional compensation shall be created to

meet the No-Net-Loss guiding principle using an adaptive management approach.

- 5.2 A photographic record of before, during and after construction, showing that all works and undertakings have been completed according to the approved Plan and conditions of this Authorization, shall be submitted to the Iqaluit, NU office of the Department of Fisheries and Oceans, Fish Habitat Management, Eastern Arctic Area, on or before December 31, 2008 and according to the schedule in 5.1 above.
- 5.3 A written report summarizing the above monitoring results shall be submitted to the Iqaluit, NU office of the Department of Fisheries and Oceans, Fish Habitat Management, Eastern Arctic Area, on or before December 31, 2008 and according to the schedule in 5.1 above.
- 5.4 The effects of the jetty on nearshore sediment transport shall be monitored during the following years: 2008, 2009, year of mine construction, year-2 of mine operation, year-2 of active mine post-closure (i.e., year prior to jetty lowering to below high water level), year-1 post-lowering of jetty.

This report addresses Sections 5.2 through 5.4 of the Authorization. Section 5.1 relates to monitoring of the compensation structures, which is scheduled to begin in 2009.

Photographic Records

The Roberts Bay jetty construction commenced on 6 July 2007 and continued until 14 July 2007, when the final load of fill material was placed. Silt curtains remained in place until after 19 July 2007 and were removed prior to winter freeze-up. Due to settling and wave action eroding the face of the jetty, the jetty was upgraded between 5 and 9 September 2008. The silt curtain was redeployed prior to 5 September 2008 and remained in place until 16 September 2008. An environmental monitor was on-site for the construction and upgrading of the jetty.

Four fish habitat compensation shoals were built west of the jetty by placing piles of rock on the ice in Roberts Bay in May 2008 by HBML, just prior to spring thaw. The shoals settled into place, to a minimum depth of 1 m below the mean water surface level, by mid-August 2008.

Sediment Transport and Deposition Monitoring

As part of the DFO authorization, HBML was required to conduct an annual bathymetric survey near the jetty to assess sediment transport and the extent of sediment deposition adjacent to the jetty (Condition 5.4).

The only substantial changes in bed elevations in Roberts Bay were due to the actual construction of the jetty and fish habitat compensation shoals, with increased bed elevations between 0.3 and 4.0 m. Bed elevation changes due to sediment transport were small in the area west of the jetty, with elevation changes between -0.1 and 0.1 m. The area east of the jetty showed very little change in elevation.

Fish Habitat Compensation Monitoring

HBML is required to monitor the stability and successful use of all fish habitat compensation structures according to Condition 5.1 of the DFO authorization. Successful use of the compensation features is defined as the establishment of primary and secondary productivity on the compensation structures, as well as documented use of the structures as rearing and feeding habitat for fish. The first year of biological monitoring was scheduled to begin in 2008; however, approval was granted by DFO to delay this initial monitoring program because the compensation shoals were still settling into place throughout the 2008 open-water season.

ACKNOWLEDGEMENTS

The authors would like to thank Chris Hanks, Director of Environment and Social Responsibility for Hope Bay Mining Ltd., for offering us the opportunity to work on this project. We would also like to thank Matt Kawei and Jill Turk of Hope Bay Mining Ltd. for their assistance during the field programs, SNC Lavalin employees for coordinating site access and accommodations for field crews, and SRK Consulting Inc. for providing construction drawings.

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Appendix I	Jetty and Habitat Compensation Structure Design and As-Built Drawings
Appendix II	Request and Authorization to Defer Biological Monitoring until 2009

1 INTRODUCTION

The previous owner of Doris North Project, Miramar Hope Bay Ltd (MHBL) proposed to construct and operate a gold mine in the West Kitikmeot Region of Nunavut (NU) in 2005. The project area is located 685 km northeast of Yellowknife and 125 km southwest from Cambridge Bay, NU, and the jetty construction site in Roberts Bay is located at the north end of the property (Figure 1.1). As part of the infrastructure required to construct and operate the Doris North mine, MHBL constructed a jetty in Roberts Bay to accommodate barge shipments to the mine in 2007.

The Doris North Project was approved by the Nunavut Impact Review Board (NIRB) and a subsequent Project Certificate was issued for the project in September 2006. As part of the infrastructure required to construct and operate the mine, HBML constructed a jetty in Roberts Bay to accommodate barge shipments to the mine. Transportation Canada and the Department of Fisheries and Oceans (DFO) authorized construction of the jetty in June 2007.

MHBL was purchased by Hope Bay Mining Ltd (HBML), a wholly owned affiliate of the Newmont Mining Corporation, in December of 2007. HBML has assumed MHBL's Fisheries Authorization and its obligations.

The DFO authorization for works or undertakings affecting fish habitat requires the implementation of a fish habitat compensation plan. The habitat compensation plan proposed in the "no net loss" plan included the construction of four near shore rock shoals located on the southeastern shore of Roberts Bay, west of the jetty (Golder 2007). Construction of these shoals was approved in June 2007, and the shoals were constructed on-ice in late winter 2008. The shoals were fully submerged by early August 2008, and had settled to the required minimum depth of 1 m below the water surface by mid-August 2008.

Due to settling and erosion, a subsequent authorization to repair the jetty was issued by DFO in August 2008. The jetty was constructed during the open water season in 2007, and repairs were performed in September 2008.

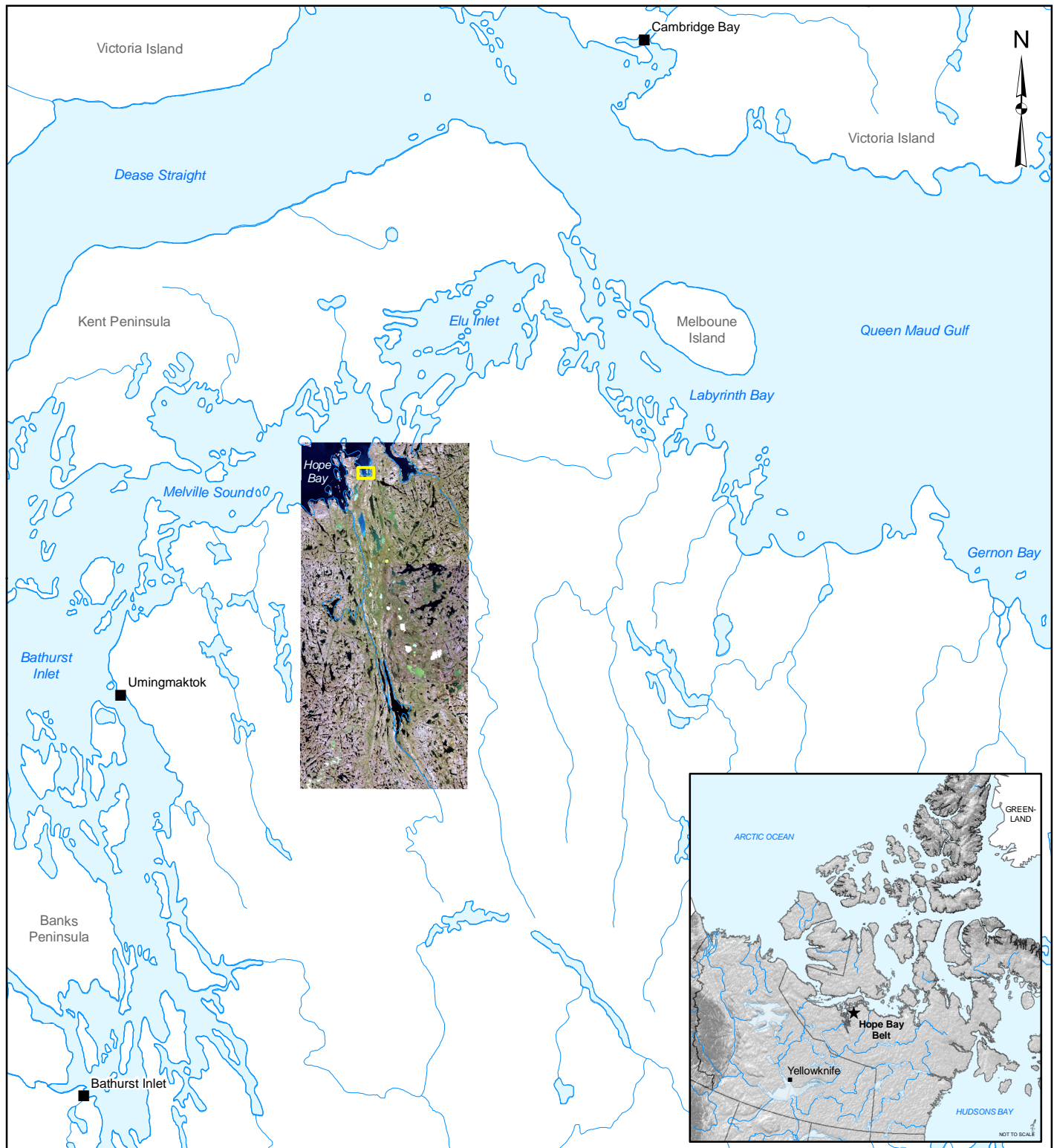
This document is submitted as part of the obligations under Section 5 of the Authorization for Works or Undertakings Affecting Fish Habitat – Section 5 Conditions related to Monitoring (DFO File NU-2-0117 Authorization No. 2 dated 28 August 2008). These obligations include the following:

- 5.1 The approved monitoring plan shall be implemented in the following years: 2009, the year prior to mine construction, year of mine construction, year-2 of mine operation, year-2 of active post-mine closure (i.e., year prior to jetty lowering below high water level), year-1 post-lowering of jetty and year-2 post-lowering of jetty. The detailed monitoring plan shall include, but not be limited to, the following:
 - 5.1.1 The stability and successful utilization of all compensation features shall be assessed according to the schedule in 5.1 above.
 - 5.1.1.1 The use of rock shoal structures as rearing and feeding habitat for fish shall be monitored using a Control/Impact (CI) design study as described in the Plan and according to the schedule in 5.1 above.
 - 5.1.1.2 Fish presence shall be monitored using sampling methods as described in the Plan and according to the schedule in 5.1 above.
 - 5.1.2 If at any time during the monitoring period, compensation features are not functioning as intended, measures shall be identified to reduce the risk of future failure and additional compensation shall be created to meet the No-Net-Loss guiding principle using an adaptive management approach.
- 5.2 A photographic record of before, during and after construction, showing that all works and undertakings have been completed according to the approved Plan and conditions of this Authorization, shall be submitted to the Iqaluit, NU office of the Department of Fisheries and Oceans, Fish Habitat Management, Eastern Arctic Area, on or before December 31, 2008 and according to the schedule in 5.1 above.
 - 5.2.1 The photographic record shall include, but not be limited to, a record of the sediment and erosion control measures and compensation measures (i.e., nearshore rock shoals).
 - 5.2.2 The photographs for each pre-construction, during construction, post-construction time periods shall be taken from the same vantage point(s) and general direction.
 - 5.2.3 All photographs shall be clearly labeled as to the date and vantage points. The photographic vantage points and viewing directions shall be indicated, and clearly indexed to the

photographs, on a plan view drawing of the construction site(s).

- 5.3 A written report summarizing the above monitoring results shall be submitted to the Iqaluit, NU office of the Department of Fisheries and Oceans, Fish Habitat Management, Eastern Arctic Area, on or before December 31, 2008 and according to the schedule in 5.1 above.
- 5.4 The effects of the jetty on nearshore sediment transport shall be monitored during the following years: 2008, 2009, year of mine construction, year-2 of mine operation, year-2 of active mine post-closure (i.e., year prior to jetty lowering to below high water level), year-1 post-lowering of jetty.
 - 5.4.1 Annual bathymetric surveys shall be conducted to determine the extent of sediment deposition adjacent to the jetty.
 - 5.4.2 A written report summarizing the results of the bathymetric surveys shall be submitted to the Iqaluit, NU office of the Department of Fisheries and Oceans-Fish habitat Management, Eastern Arctic Area on, or before, December 31 of each year, according to the schedule in 5.4 above.

This report addresses Sections 5.2 through 5.4 of the Authorization. Section 5.1 relates to monitoring of the compensation structures, which is scheduled to begin in 2009.





LEGEND

- COMMUNITY
- WATERCOURSE
- WATERBODY
- JETTY CONSTRUCTION SITE

REFERENCE

Base data obtained from Government of Canada, Natural Resources Canada, Centre for Topographic Information (1:50 000). Landsat 7 imagery capture in 2007, obtained from CanImage.
Projection: UTM Zone 13 Datum: NAD 83



PROJECT		HOPE BAY MINING LTD.			
					
TITLE					
PROJECT LOCATION MAP					
 Edmonton, Alberta		PROJECT NO. 08-1373-0026	SCALE AS SHOWN	REV. 0	
		DESIGN	AH	24 Sep. 2008	FIGURE: 1.1
		GIS	RC	6 Oct. 2008	
		CHECK	AH	16 Dec. 2008	
		REVIEW	GA	22 Dec. 2008	

2 PHOTOGRAPHIC CONSTRUCTION RECORDS

The DFO authorization specified that a qualified biologist or environmental inspector be on site during in-water work and compensation structure installation (Condition 3.2). A qualified biologist was on-site to monitor and document construction of the jetty in 2007 and the repairs to the jetty in September 2008. Surveys conducted by Sub-Arctic Surveys at the time of rock placement document that the shoals were constructed according to the approved design dimensions (Appendix I). All in-water work was conducted outside of the restricted work period of 15 July to 30 August of any year (as stated in the authorization), with the exception of the removal of the silt curtains after allowing for settling in July 2007 (this was agreed to by DFO prior to the 15 July deadline).

The as-built drawings for the completed jetty were submitted to DFO by SRK Consulting Ltd. in late 2007 (Appendix I). The as-built drawings for the habitat compensation shoals, provided by SNC-Lavalin, show estimated depths of the shoals after settling based on on-ice placement and dimensions (Appendix I).


As part of the DFO authorization for construction of the jetty and habitat compensation shoals (Condition 5.2), HBML must provide a photographic record of before, during, and after construction to show that construction was completed according to the approved plans and conditions. The locations and aspect of the individual photos are indicated on Figure 2.1.

2.1.1 Jetty Construction

The Roberts Bay jetty construction commenced on 6 July 2007 with the installation of silt curtain side panels. Construction continued until 14 July 2007, when the final load of fill material was placed. Silt curtains remained in place until after 19 July 2007. Golder Associates Ltd. was hired by HBML to monitor the jetty construction activities. The environmental monitor was present on-site during the jetty construction, and photographed Roberts Bay before, during and after construction activities. The photos indicate measures taken to control sediment and erosion as well as daily construction progress (Photos 2.1 to 2.21).



LEGEND

-  PHOTO VANTAGE POINT
-  JETTY
-  CONTOUR (10 m INTERVAL)
-  WATERCOURSE
-  WATERBODY
-  COMPENSATION SHOAL

REFERENCE

Base data obtained from Government of Canada, Natural Resources Canada, Centre for Topographic Information (1:50 000). Landsat 7 imagery capture in 2007, obtained from CanImage.
Projection: UTM Zone 13 Datum: NAD 83

100 0 100
SCALE 1:4000 METRES

PROJECT



HOPE BAY MINING LTD.

TITLE

2007 AND 2008 PHOTOGRAPHIC RECORD, VANTAGE POINTS



PROJECT NO. 08-1373-0026			SCALE AS SHOWN	REV. 0
DESIGN	AH	23 Oct. 2008	FIGURE: 2.1	
GIS	RC	10 Dec. 2008		
CHECK	AH	16 Dec. 2008		
REVIEW	GA	22 Dec. 2008		



Photo 2.1 **Aerial View Facing East at Roberts Bay (Pre-construction; note sediment plume in Roberts Bay), July 2006.**



Photo 2.2 **Aerial View Facing West at Roberts Bay (Pre-construction), 6 July 2007.**



Photo 2.3 Facing North-West During Silt Curtain Deployment in Roberts Bay, 6 July 2007.



Photo 2.4 Aerial View of Silt Curtain Deployment in Roberts Bay, 6 July 2007.



Photo 2.5 Facing North at the Jetty Location During Geo-Grid Placement in Roberts Bay, 7 July 2007. Note Silt Curtain Surrounding the In-Water Construction Area.



Photo 2.6 Facing South in Roberts Bay During Initial Fill Placement for the Jetty Construction, 7 July 2007.



Photo 2.7 Facing East as Rock Truck Unloads Material onto the Root of the Jetty, 7 July 2007.



Photo 2.8 Looking North at the Jetty in Roberts Bay, End of the First Day of Fill Placement, 7 July 2007.



Photo 2.9 **Aerial View of Roberts Bay Jetty Construction Progress, Facing South, 7 July 2007.**



Photo 2.10 **Aerial View of Roberts Bay Jetty Construction Progress, Facing North, 8 July 2007.**



Photo 2.11 Facing North During Geo-Grid Placement, 8 July 2007.



Photo 2.12 Facing East During Rock and Geo-Grid Placement, 8 July 2007.



Photo 2.13 Roberts Bay, Aerial View of Jetty Construction Progress, 9 July 2007.



Photo 2.14 Facing North-East on Jetty as Geo-Grid is Rolled Out, 9 July 2007.



Photo 2.15 **Aerial View of Geo-Grid Placement Before Fill Placement, 9 July 2007.**



Photo 2.16 **Facing South in Roberts Bay – View of the Jetty Extension, 10 July 2007.**



Photo 2.17 **Aerial View of Jetty, Facing South, 14 July 2007.**



Photo 2.19 **Facing North-East – View Towards the Jetty During Grading of the Jetty Head, 14 July 2007.**



Photo 2.19 Facing West Along the Jetty Head - Note the Slope Grading and the Settlement Beacons, 16 July 2007.



Photo 2.20 Facing North-East from the Shoreline at Roberts Bay, 10 July 2007.



Photo 2.21 Aerial View of the Roberts Bay Jetty Five Days After Completion of Construction, 19 July 2007.

2.1.2 Shoal Construction

Four fish habitat compensation shoals were built by placing piles of rock (31.25 m long by about 12 m wide) on the ice west of the jetty in Roberts Bay in May 2008, just before spring thaw. The fill material used in the construction of the shoals was clean quarried rock that met specifications outlined in the plan design (Golder 2007). Photo 2.22 shows the bay, with the completed jetty, during the open water season prior to construction of the habitat compensation shoals. Photos taken of the shoals are during the post-construction period (Photos 2.22 to 2.28). The shoals melted through the ice surface by late June 2008, and settled into place, to a minimum depth of 1 m below the mean water surface level, by mid-August 2008.



Photo 2.22 Facing West Towards Near Shore Compensation Shoals, 5 June 2008
(Photo: Nuna Logistics).



Photo 2.23 Compensation Shoals Above Ice, 11 June 2008
(Photo: Nuna Logistics).



Photo 2.24 Facing North-West Along Compensation Shoals Showing Shoals Resting on the Frozen Substrate, 11 July 2008 (Photo: Matt Kawei, HBML).



Photo 2.25 Facing South-East Along the Compensation Shoals, Showing Shoals Resting on the Frozen Substrate, 11 July 2008 (Photo: Matt Kawei, HBML).



Photo 2.26 Looking South-East at Compensation Structures, 13 July 2008. Note the Structures are Settling as the Ice Below Them Melts.



Photo 2.27 Facing North-West From Shore Towards Compensation Structures, 13 July 2008.



Photo 2.28 **Aerial view of submerged compensation structures, 12 October 2008**
(Photo: Matt Kawei, HBML).

2.1.3 Jetty Upgrade

After initial construction of the Roberts Bay jetty in 2007, the fill materials had settled and wave action eroded the face of the jetty. The jetty was upgraded between 5 and 9 September 2008. A Golder environmental monitor was on-site for the in-water work. Prior to the Golder monitor arriving at Roberts Bay, Nuna Logistics had installed a silt curtain around the jetty to prevent silt dispersion and potential impacts to fish habitat. The sediment boom remained in place until 16 September 2008, 10 days after the in-water work was completed. Photos of the jetty upgrade were taken from three main vantage points along the shoreline at Roberts Bay and from a helicopter (Photos 2.29 to 2.38).



Photo 2.29 Facing North at Jetty Before Upgrade, 5 September 2008.



Photo 2.30 Facing North-East as the Upgrade Began, 5 September 2008.



Photo 2.31 Facing East as Rock Truck Unloads Fill, 5 September 2008.



Photo 2.32 Facing North-West in the Early Stages of the Roberts Bay Jetty Upgrade, 5 September 2008.



Photo 2.33 Facing South on the Jetty, Looking at the Western Edge Expansion, 6 September 2008.



Photo 2.34 Aerial View of the Roberts Bay Jetty Upgrade Progress, 6 September 2008.



Photo 2.35 Facing North-West as Jetty Upgrade Passes the Halfway Point, 6 September 2008.



Photo 2.36 Aerial View of the Jetty With Upgrade Completed, 13 September 2008.



Photo 2.37 Facing North, Looking at Jetty Post-Upgrade with Top Gravel Layer, 17 September 2008.



Photo 2.38 Aerial View Facing West, Looking at Jetty Post-Upgrade with Top Gravel Layer, 17 September 2008.

3 SEDIMENT TRANSPORT AND DEPOSITION MONITORING

As part of the DFO authorization, HBML was required to conduct bathymetric surveys near the jetty to assess sediment transport and extent of sediment deposition adjacent to the jetty according to the schedule defined in Condition 5.4. The bathymetric survey was done on 13 September 2008.

3.1 METHODS

The bathymetric survey was conducted with a Teledyne RD Instruments Workhorse Rio Grande ADCP (Acoustic Doppler Current Profiler) instrument designed to operate from a moving boat, with GPS integration capability. The Rio Grande ADCP unit was connected to a Leica GPS 1200 system (RTK GPS), which is an advanced Global Navigation Satellite System and uses real time kinematic algorithms for highly accurate positioning. The Rio Grande ADCP unit was calibrated to account for offset values such as the salinity of the ocean and transducer depth. Pitch and roll corrections were incorporated by Rio Grande ADCP unit internal sensors.

On each side of the jetty, 15 transects were established. Each transect extended 200 m out into Roberts Bay and transects were approximately 20 m apart. This allowed for a survey area that extended approximately 330 m on each side of the jetty, with a total area of approximately 12 ha.

Bed elevation data were collected along each transect using a boat with the Rio Grande ADCP unit connected to the RTK GPS unit. For land and shallow water areas near the shore, where boat access was not possible, bed elevations were measured by wading and walking with the RTK GPS rover sensor.

The area between the shoreline and the 0.5 m isobath was covered with few survey points, because the fine sediments in this area resulted in the operator sinking through the top layer of sediments while wading. In the nearshore area adjacent to the jetty, a silt curtain (see Photo 2.36) was also present during the surveys, making access more difficult and meaning that sediments may have been disturbed during silt curtain installation.

Approximately 150 m to the west of the jetty, Subarctic Surveys established a benchmark on a bedrock outcrop on the shoreline (Table 3.1).

Table 3.1 Benchmark UTM Coordinates and Elevation, 2008

Benchmark	UTM Coordinates (Zone 13 NAD 83)		Elevation
	Easting	Northing	
Base_Station	432383.018 m	7563208.431 m	1.515 m

The raw elevation point data collected during the bathymetric surveys were corrected for tide effects and were referenced to the Base_Station benchmark on the shore. The corrected data were then imported into ArcGIS software to create the bathymetry maps.

3.2 RESULTS

A previous bathymetry survey in the Roberts Bay was done in 2006, prior to jetty construction (Figure 3.1; Golder 2006). The 2008 bathymetry surveys show the same general characteristics in bed elevation in the Roberts Bay area (Figure 3.2). Survey results from specific areas of interest are discussed in the following sections.

3.2.1 Rock Placement Areas

Major changes to bed elevations occurred in the area where the jetty and fish habitat compensation shoals were constructed (Figure 3.3). Shoal modifications occurred in the area between the 0.5 and 2.0 m isobaths in the jetty area of the bay. The shoal locations are visible west of the jetty on the map presented in Figure 3.2.

At the jetty, the greatest changes occurred at its north end, where the jetty is in the deepest water with the steepest natural bed slope. Here, the increase in bed elevation is between 1 and 4 m. Bed surface elevations at the shoals have increased by 0.3 to 1.0 m relative to the natural bed elevation before rock placement (Figure 3.3).

These changes to bed elevation were designed to meet the purpose of these structures. Rock placement may have also physically displaced bed sediments, displacing them outwards and upwards. In addition, manoeuvring of the barges has been observed to cause substantial disturbance to the sediments.

3.2.2 Nearshore Areas

Fine sediment was present in the shallowest nearshore areas, proximate and distant from the jetty, during the surveys in 2008. This type of sediment was also present prior to jetty construction. The sediment made wading surveys difficult, so some nearshore areas were not surveyed if they were not accessible by boat. In addition to this, construction was ongoing at the jetty during the surveys (see Photo 2.36) and bed conditions were affected by recent silt curtain installation and rock fill placement. Bed elevations to the east and west of the jetty were surveyed where water depths were greater than approximately 0.5 m.

On the west side of the jetty, the majority of the surveyed area showed little change in bed elevation, with measured differences mainly being between -0.1 and 0.1 m. East of the jetty, the bed elevations showed little change for the shallow, nearshore areas (Figure 3.3).

There does not appear to have been a consistent pattern of bed elevation increase or decrease on either side of the jetty in the nearshore area.

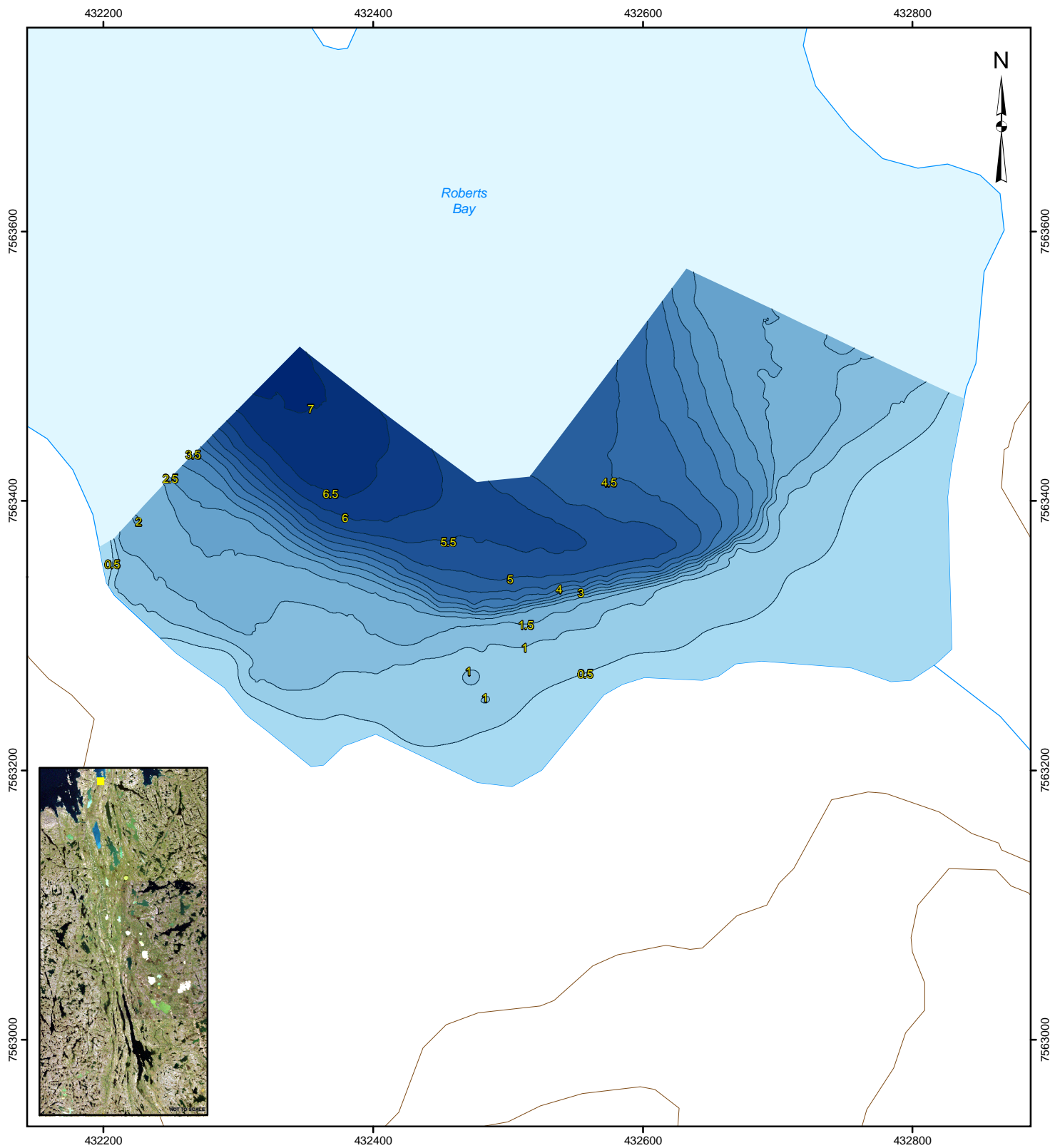
3.2.3 Offshore Areas

Offshore areas refer to the areas with depths above approximately 2.0 m, progressing outwards from the shore to the area where bed slopes steepen dramatically. Some of the largest bed elevation changes measured during the surveys were in this area. Changes could be due to disturbance of this slope during construction, during barge operations and manoeuvring or during natural storm events. Additionally, because of the steep slope, the magnitude of change is very sensitive to small discrepancies in location measurements in the horizontal plane between the 2006 and 2008 surveys.

Only a small area in the steep slope region west of the jetty showed lower bed elevations in 2008, of between -0.1 and -0.3 m compared with the 2006 surveys (Figure 3.3).

The steep slope region east of the jetty displayed a larger area with bed elevations between -0.3 and -0.5 m lower in 2008 than in 2006, with a smaller area with bed elevations reduced by between 0.7 and 0.9 m. East of this area, the bed elevations over the steep slope showed values increased by 0.5 to 1.0 m for a small area.

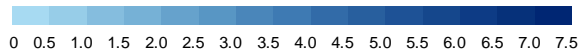
M:\Projects\2008\1373\0026_HBML_Doris_North_Environmental_Programs\MapDocs\mxd\Current\VDFO_Report\Fig3_1_AQ_BM_RobertsBay_Bathy_2006_12Dec2008_FINAL.mxd



LEGEND

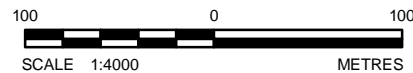
- CONTOUR (10 m INTERVAL)
- ISOBATH (0.5 m INTERVAL)
- WATERCOURSE
- WATERBODY

WATER DEPTH (m)



REFERENCE

Base data obtained from Government of Canada, Natural Resources Canada, Centre for Topographic Information (1:50 000). Landsat 7 imagery capture in 2007, obtained from CanImage.
Projection: UTM Zone 13 Datum: NAD 83



PROJECT



HOPE BAY MINING LTD.

TITLE

2006 ROBERTS BAY BATHYMETRY



PROJECT NO. 08-1373-0026			SCALE AS SHOWN	REV. 3
DESIGN	PE	19 Nov. 2008	FIGURE: 3.1	
GIS	RC	12 Dec. 2008		
CHECK	DC	22 Dec. 2008		
REVIEW	NS	22 Dec. 2008		