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Memo

To:	Chris Hanks, Bill Patterson, Lea-Marie Bowes-Lyon	**Date:**	September 24, 2010
cc:	Deborah Muggli, Christine Kowbel	**From:**	Megan Kinsey, Maritz Rykaart
Subject:	Design Brief: Doris North Project Airstrip Expansion and Airstrip Bypass Road	**Project #:**	1CH008.027

1 Introduction

Hope Bay Mining Limited (HBML), a wholly owned subsidiary of Newmont Mining Company (NMC) is currently in the process of constructing their Doris North Project (Project) in the Kitikmeot region of Nunavut, Canada. All-weather air access is serviced through a 746 m long, 23 m wide non-instrumented airstrip. The largest planes that this airstrip accommodates are Dash 8 and Buffalo. This airstrip also doubles as the primary access road between Roberts Bay and the Doris Camp. During periods when the aircraft are taking off or landing, site access is stopped.

To ensure uninterrupted use of the airstrip as well as improve site safety, HBML proposed to construct an all-weather airstrip bypass road immediately east of the airstrip and expand the airstrip to the south to an overall length of 1,795 m and width to the east to 46 m. The airstrip is not located optimally with respect to prevailing winds, and due to the presence of the Doris Mesa, this expansion will significantly improve the operational safety of the airstrip. The expanded airstrip would also accommodate larger aircraft which would significantly improve site logistics.

This memo provides complete details of the airstrip bypass road design and the airstrip expansion. This should be read in conjunction with the attached set of detailed engineering drawings (Attachment A).

2 Design Concept

The existing roads at the Doris North Project have been designed in accordance with the Nunavut Mine Safety Act pertaining to haul roads. Although the site roads are currently not classified as true haul roads, HBML opted to choose this as the primary design criteria. The existing airstrip has been designed in accordance with Transport Canada's Aerodrome Standards and Recommended Practices (Transport Canada 2005).

Since the Doris North Project is being constructed on KIA land, HBML has secured a Commercial Lease for the property. The proposed location of the airstrip bypass road as well as the expanded airstrip is within the Commercial Lease boundary. The KIA has approved this proposal.

3 Expansion Alternatives

HBML considered a number of alternative airstrip locations rather than expanding the existing Doris North Airstrip; however, alternative locations were not within the general confines of the Doris North Project. These sites would require extensive additional all-weather roads, outside of the defined footprint of the Project for access. Subsequently, expanding the airstrip was the only viable alternative presented.

Two airstrip bypass road alternatives were considered. The following is a summary of these alternatives:

- Bypass to the west of the airstrip. This road would be accessed immediately south of the Lower Reagent Pad, past Quarry #5 before re-joining the Roberts Bay access road immediately north of the north airstrip apron. This road would be at least 3.5 km long. There are at least three known fish bearing streams that would have to be crossed. To ensure all obstacle limitations are met, a portion of the rock outcrop north of the north airstrip apron would require drilling and blasting. These challenges resulted in the elimination of this alternative from further consideration.

- Bypass road to the east of the airstrip. This road starts from the Upper Reagent Pad and ends about 300 m north of the north apron. The road is about 2.9 km long and does not cross any fish bearing streams. A portion of the rock outcrop at the road entrance must be drilled and blasted to ensure obstacle limitation clearance. This would require drilling and blasting even if the bypass road was not in that area. This is the preferred alternative.

4 System Design

4.1 Design Criteria

4.1.1 Airstrip

The airstrip is for private use and will support year round operations of the Project. Normal use would include routine crew change, cargo capability and emergency medical evacuation support. The airstrip will be a non-instrumented runway in accordance with the Aerodrome Standards and Recommended Practices (Transport Canada 2005) and recommended airstrip geometry from First Air (2004). Visual approach procedures will be utilized.

The design aircraft for the Hope Bay airstrip expansion is a Lockheed L382G Hercules with a length of 112’9” (34.4 m), a wing span of 132’7” (40.4 m), and a maximum payload of 23 tonnes.

The design length chosen for the airstrip expansion is 1,795 m, greater than the recommended length of 5,000 ft (1,524 m) for a Lockheed L382G Hercules aircraft (First Air 2004). This airstrip length was chosen to compensate for the fact that the airstrip alignment is not optimal with respect to the prevailing wind. A summary of the design geometry of the Airstrip Expansion can be seen in Table 1.

Table 1: Design Geometry of Doris North Airstrip Expansion

Design Component	Design Criteria
Aircraft	L382G (Hercules).
Runway Length	1795 m (5889').
Runway Width	46 m (150').
Taxiway	Single airstrip, therefore no Taxiway.
Ramp/Apron	Apron located at each end of the airstrip. North apron includes small laydown area; dimensions are 87 m x 61 m. South apron dimensions are 61 m x 61 m.
Slope	Maximum longitudinal slope of the runway of 1.5% up or down. Maximum longitudinal slope change of 1.5%. Symmetrical 1.0% crown for drainage. 3H:1V side slopes.
Waviness	The runway is designed so that no undulations occur, if undulations occur over time they should be filled in during regular maintenance.
Obstacle Clearance Requirements	No buildings, cargo or other obstructions shall be within 23 m of the runway centerline. Beyond that, any object must be below the obstacle limitation surface which rises with a slope of 7H:1V (14.3%), to an outer surface 45 m above the runway reference point. The outer surface of the obstacle limitation surface extends 4000 m from the centerline of the runway 360º. The crest off all roads must be 4.3 m below the obstacle limitation surface to be trafficable during takeoff/landing.
End Clearance Requirements	At the end of each runway there is a 60 m of level surface beyond which the end clearance surface of the airstrip rises with a slope of 50H:1V (2.5%) to a distance of 2500 m.

4.1.2 Airstrip Bypass Road

The design vehicle for the airstrip bypass road is a Super B-Train. To allow duel lane traffic of this vehicle, the minimum crest road width will need to be 8 m. Where the road shoulder exceeds 3 m above ground, the road will be widened by 1 m and a safety barrier will be constructed at least 1 m high. Larger vehicles and equipment will occasionally travel this road and therefore turnouts (4 m wide and 30 m long) are strategically located along the road. Where the road fill is less than 2 m it will have side slopes of 1.5H:1V, and for fill thicknesses greater than 2 m the slopes will be 2H:1V.

4.2 Survey Data

The design of the airstrip expansion and airstrip bypass road was based on topographical contour maps produced from 2008 aerial photography supplied by HBML.

4.3 Foundation Conditions

Comprehensive geotechnical investigations have been carried out at the Doris North Site (SRK 2009). This information confirms that the area lies within the zone of continuous permafrost, with the permafrost being up to 550 m deep. Permafrost temperature at the surface is about -8ºC and the active layer is generally less than 1 m thick. Laboratory and in-situ tests on disturbed and undisturbed samples indicate that the overburden soils are predominantly comprised of marine silts and clays, and the pore-water in these soils have high salinity, depressing the freezing point to -2ºC. The ice-rich overburden soils are typically between 5 and 20 m deep, before encountering competent bedrock, predominantly basalt. Bedrock is frequently exposed, rising columnar 5 to 100 m above the surrounding landscape.

4.4 Airstrip and Bypass Road Design

Thermal modeling was completed to determine how much fill would be required over the tundra to ensure the permafrost would be preserved for infrastructure construction such as the airstrip expansion and bypass road (SRK 2006). Based on this assessment, the airstrip expansion will have a minimum fill thickness of 2 m, to match the existing airstrip. The airstrip bypass road will be three fill thicknesses (Zone 1, Zone 2 and Zone 3) and each of these zones is based on site specific ground conditions. Details of this are presented in Attachment A.

The airstrip and bypass road will be constructed from Run of Quarry (ROQ) material obtained from local approved and permitted rock quarries. This material will be placed in lift thicknesses that do not exceed 1.85 m and compacted using a vibratory drum compactor using a site specific compaction specification. The surfacing layer of the road consists of a 150 mm thick layer of 1¼ inch crush, while the airstrip has another layer of 150 mm thick ¾ inch crush over this material.

4.5 Airstrip Profile

The longitudinal profile of the airstrip expansion can be seen in Attachment A. From the edge of the north apron to station 0+470 the airstrip expansion has no longitudinal slope, but south of station 0+470 the airstrip slopes upwards at an angle of 1.5%. A vertical curve with a radius of 15,000 m connects these slopes.

4.6 Bypass Road Profile

The bypass road profile is included in Attachment A. Generally the slope is less than 3%; however, in some small sections the slope does reach 5%. This is below the overall maximum design slope of 10%.

4.7 Obstacle Limitation Surface

The obstacle limitation surface is a theoretical surface extending from all edges of an airstrip, which limits the height of obstacle in the vicinity of an airstrip. The slope and extents of the obstacle limitation surface of the airstrip expansion is provided in Table 1, and is based on the requirements set out by Transport Canada (2005). The ground elevations in three areas surrounding the airstrip have been determined to be above the obstacle limitation surface, as illustrated in Attachment A. To meet the requirements of the aerodrome standards, these areas will have to be blasted; however, as the airstrip is a private airstrip a decision on levelling these areas will have to be reached between HBML and their charter company. Development plans for these areas to be cut are discussed below. It is assumed that the Mesa will not be cut; therefore a cut development plan for this area is not discussed.

At this time HBML does not intend to develop Quarry 5 for construction purposes. Quarry 5 development will be limited to the one area where the ground surface has been identified as above the obstacle limitation surface of the airstrip. If this area is excavated, the minimum amount of rock required will be removed, and the floor of the blasted area will be sloped for natural drainage. Rock in Quarry 5 has been geochemically characterized and determined to be non-acid generating, the material produced from this cut could be used for construction (Attachment B).

Drawings in Attachment A display the cut development plan for the area along the south west side of the airstrip which is above the obstacle limitation surface. This area would be cut to an average depth of 3 m with the cut floor sloping towards the west. It is estimated that 19,000 m^3 of material would be removed from this location. Attachment C discusses the geochemical properties of this rock and the suitability of use for construction material.

All areas will be developed such that the blasted floor of each area will drain naturally and the final elevation of the floor will be a minimum of 1 m above tundra.

4.8 Construction Methodology

The airstrip bypass road will be constructed with ROQ material excavated from drilling and blasting the new Roberts Bay tank farm base, as well as any cut required to meet the obstacle limitations. The airstrip expansion will be constructed from other designated rock quarries forming part of the Doris North Project.

Crush for both the bypass road and airstrip expansion will be from the crusher located in Quarry #2. Complete material quantities are included in Attachment A.

5 References

First Air, 2004. Private Airport Standards. November 1, 2004.

SRK Consulting (Canada) Inc., 2006. Doris North Project – Thermal modeling to support design thickness for granular pads. Technical Memorandum, Prepared for Miramar Hope Bay Limited, Project Number: 1CM014.008, August 20, 2006.

Transport Canada, 2005. Aerodrome Standards and Recommended Practices. Air Navigation System Requirements Branch. 4th Edition, March 1, 1993, revised March, 2005. Document TP 312E.

Attachment A
Drawings

Engineering Drawings for the Doris North Airstrip Expansion Doris North Project, Nunavut, Canada

ACTIVE DRAWING STATUS

SRK DWG NUMBER	NEWMONT DWG NUMBER	DRAWING TITLE	REVISION	DATE	STATUS	OLD/REPLACED REVISIONS
DN-AE-00	HB+A-CIV-CIV-AGG-0001	Engineering Drawings for the Doris North Airstrip Expansion	B	Oct. 7, 2010	Issued for Discussion	Rev. A, Sept. 27, 2010
DN-AE-01	HB+A-CIV-CIV-AGG-0002	General Arrangement	B	Oct. 7, 2010	Issued for Discussion	Rev. A, Sept. 27, 2010
DN-AE-02	HB+A-CIV-CIV-AGG-0003	Airstrip Expansion - Plan and Centerline Profile	A	Sept. 27, 2010	Issued for Discussion	
DN-AE-03	HB+A-CIV-CIV-AGG-0004	Airstrip Expansion - Sections	A	Sept. 27, 2010	Issued for Discussion	
DN-AE-04	HB+A-CIV-CIV-AGG-0005	Airstrip Bypass Road - Plan and Centreline Profile	A	Sept. 27, 2010	Issued for Discussion	
DN-AE-05	HB+A-CIV-CIV-AGG-0006	Airstrip Bypass Road - Sections	A	Sept. 27, 2010	Issued for Discussion	
DN-AE-06	HB+A-CIV-CIV-AGG-0007	Cut Development Plan	A	Sept. 27, 2010	Issued for Discussion	
DN-AE-07	HB+A-CIV-CIV-AGG-0008	Material Specifications	A	Sept. 27, 2010	Issued for Discussion	

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PROJECT NO: 1CH008.027
ISSUED FOR DISCUSSION
Revision B
October 7, 2010
DN-AE-00 / HB+A-CIV-CIV-AGG-0001

NOTES:

1. The designs are based on the contour information shown on these drawings. It is however the Contractor's responsibility to confirm that the contours are a fair reflection of the ground levels in the vicinity of the works, and to advise the Construction Manager and Engineer of any differences.
2. The co-ordinate system is UTM NAD 83, Zone 13.
3. All dimensions are in metric units, unless specifically mentioned.
4. All drawings are scaled appropriately for D-Size construction drawings. Scales may not be correct if these drawings are reproduced and presented in any other size format.
5. The Engineer will provide the Construction Manager and Contractor with digital design files for setting out the works. The Engineer will instruct the Contractor to survey random spot checks to confirm whether the works have been set out correctly.
6. All engineering specifications for execution of the works are listed on the drawings or references to external documents are provided.
7. The Contractor and Construction Manager shall familiarize themselves with all appropriate Licences and/or Permits petaining to execution of the Works. The Engineer will not be responsible for any infringements.
8. The Contractor is to take due care that no wildlife or birds' nest are disturbed during contruction. The Construction Manager is to be immediately notified if such sites are found.
9. The Contractor will employ best practices to identify archaelogical sites, and maintain archaelogical site exclusion boundaries of 30m minimum radius from any of these works.
10. These works must be executed in accordance with the standard HBML health and safety, and enviromental standards and protocols. It is the Contractors responsibility to familiarize himself with these documents.
9. Construction of the works may not commence without on-site presence of an Engineers' representative. The Contractor shall notify the Engineer at least 5 days in advance of intended construction start-up.
10. The placement of rockfill material will be by CAT 773 and CAT 730 haul trucks. The Contractor must supply the Construction Manager and Engineer with a written procedure for how these works will be constructed using these trucks prior to the start of any construction.
11. The Contractor shall notify the Engineer at least 3 days in advance if an inspection is required for acceptance of works at any stage.
12. The Contractor shall employ best practices to ensure sediment control and to prevent erosion.
13. Construction shall be in accordance with the following Technical Specifications: Earthworks and Geotechnical Engineering, Hope Bay project, Nunavut, Canada, revision C -Issue for Construction.
14. Notes in this drawing apply to all other active drawings.

LEGEND

- Ground Surface above Obstacle Limitation Surface
- Airstrip Expansion and Bypass Road
- Existing Infrastructure
- Lease Boundary

0 50 100 150 200 250
Scale in Metres

NO.	DESCRIPTION	CHK'D	APP'D	CLIENT	DATE
B	ISSUED FOR DISCUSSION	MK	EMR		07OCT10
A	ISSUED FOR DISCUSSION	LW	EMR		27SEP10

REVISIONS

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

PROFESSIONAL ENGINEER'S STAMP

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DESIGN: MK
DRAWN: LR
REVIEWED: EMR
CHECKED: LW
APPROVED: EMR
DATE: OCT. 7, 2010
FILE NAME: 01 AE – Gen Arrangement.dwg

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NORTH AMERICA

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SRK JOB NO.: 1CH008 027
SRK DWG NO.: DN-AE-01

Doris North Project

DRAWING TITLE:
General Arrangement

NEWMONT DRAWING NO.: HB+A-CIV-CIV-AGG-0002
SHEET: 2 OF 8
REVISION NO.: B

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Airstrip Expansion - Plan

0 25 50 75 100 125
Horizontal Scale in Meters

A - Section A-A' at Airstrip Centreline

0 25 50 75 100 125
Horizontal Scale in Meters

0 5 10 15 20 25
(5X Exaggeration) Vertical Scale in Meters

LEGEND

- AE01 Stake Out Points
- Existing Infrastructure
- Proposed Airstrip Expansion
- Streams

NO.	DESCRIPTION	CHK'D	APP'D	CLIENT	DATE
A	ISSUED FOR DISCUSSION	LW	EMR		27SEP10

REVISIONS

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

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DESIGN: MK
DRAWN: LR
REVIEWED: EMR
CHECKED: LW
APPROVED: EMR
DATE: SEPT. 27, 2010
FILE NAME: 02 AE – Airstrip Exp_Plan and Profile.dwg

NEWMONT NORTH AMERICA

HOPE BAY MINING LIMITED

SRK JOB NO.: 1CH008 027
SRK DWG NO.: DN-AE-02

Doris North Project

DRAWING TITLE:
Airstrip Expansion
Plan and Centerline Profile

NEWMONT DRAWING NO.: HB+A-CIV-CIV-AGG-0003
SHEET: 2 OF 10
REVISION NO.: A

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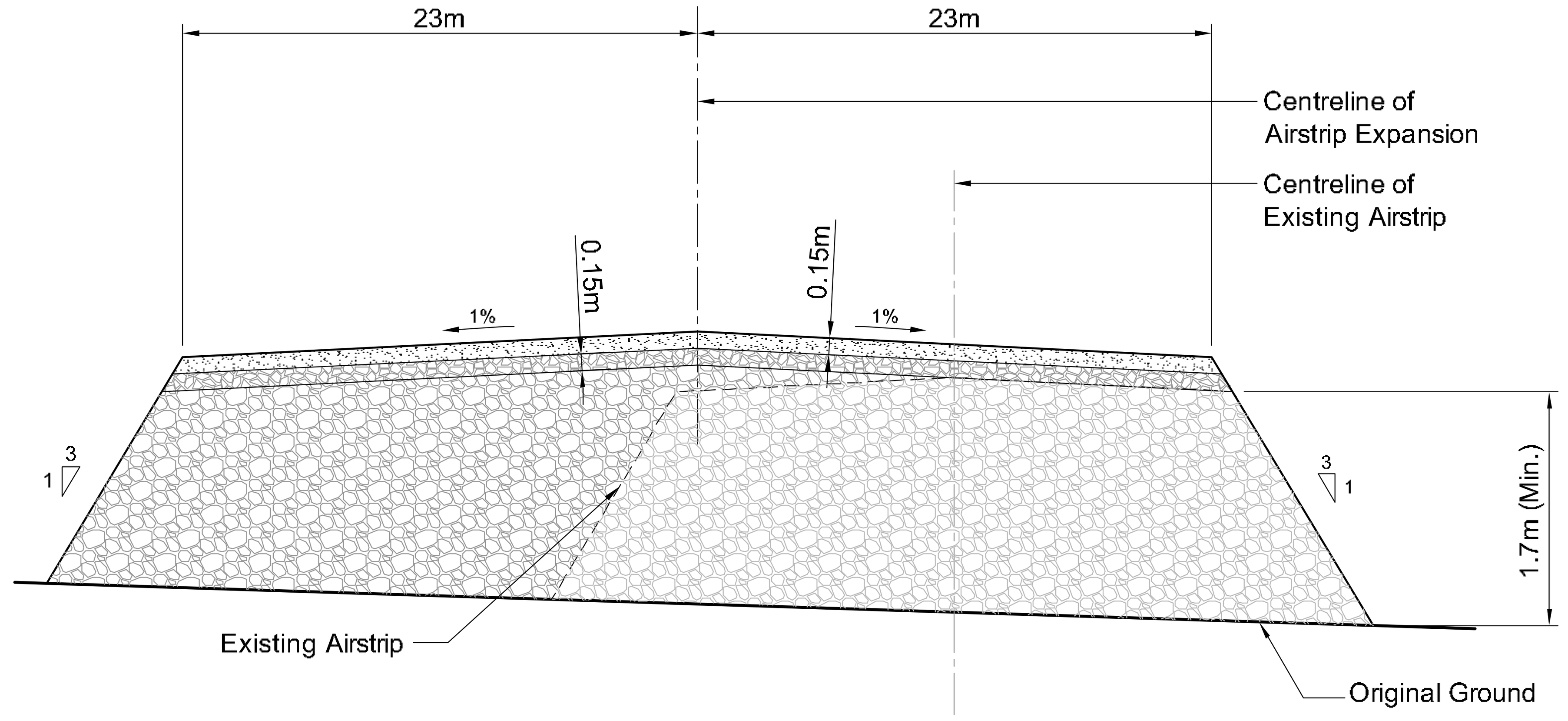
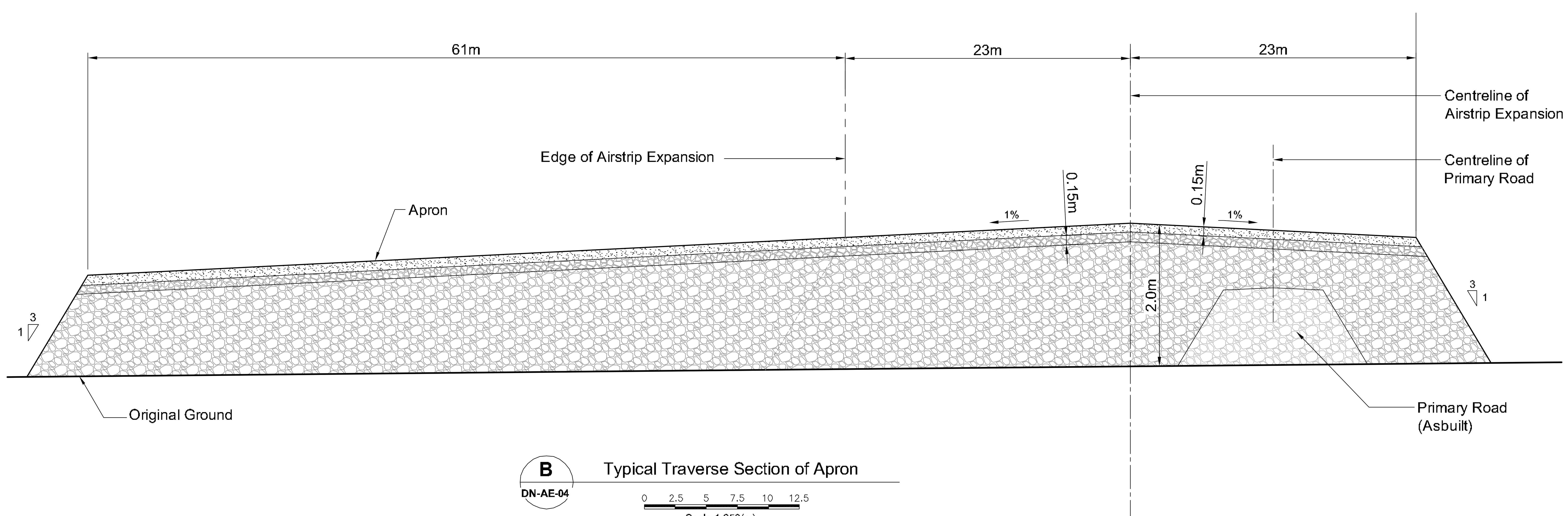


A DN-AE-04 Typical Cross Section of Airstrip Expansion

0 2.5 5 7.5 10 12.5
Scale 1:250(m)
0 0.5 1 1.5 2 2.5
Scale 1:50(m)



B DN-AE-04 Typical Traverse Section of Apron

0 2.5 5 7.5 10 12.5
Scale 1:250(m)
0 0.5 1 1.5 2 2.5
Scale 1:50(m)

NOTES

1. All dimensions in metres unless noted otherwise.
2. Notes in this drawing apply to all other active drawings.

LEGEND

- 3/4" Finishing Material
- Surfacing Material
- Run of Quarry Material

NO.	DESCRIPTION	CHK'D	APP'D	CLIENT	DATE
A	ISSUED FOR DISCUSSION	LW	EMR		27SEP10

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DESIGN: MK	DRAWN: LR	REVIEWED: EMR
CHECKED: LW	APPROVED: EMR	DATE: SEPT. 27, 2010

FILE NAME: 03 AE – Airstrip Sections.dwg

NEWMONT NORTH AMERICA

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SRK JOB NO.: 1CH008 027 | SRK DWG NO.: DN-AE-03

Doris North Project

DRAWING TITLE: Airstrip Expansion Sections

NEWMONT DRAWING NO.: HB+A-CIV-CIV-AGG-0004 | SHEET: 4 OF 8 | REVISION NO.: A

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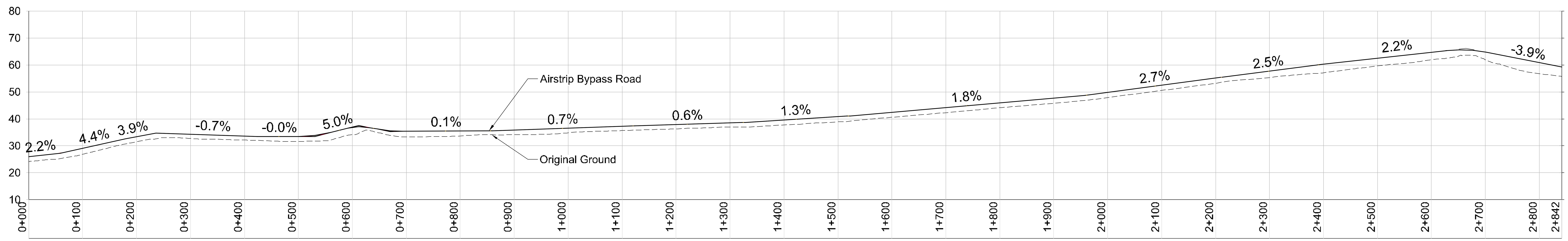
Airstrip Bypass Road - Plan

0 40 80 120 160 200
Scale in Meters



Section A-A' at Airstrip Bypass Road Centreline

0 40 80 120 160 200
Scale in Meters

0 8 16 24 32 40
(5X) Vertical Scale in Meters

Road Construction Zones Table

Fill Zone 1	1.0m minimum overall road thickness with 1.5H:1V slopes
Fill Zone 2	1.5m minimum overall road thickness with 1.5H:1V slopes
Fill Zone 3	2.0m minimum overall road thickness with 1.5H:1V slopes
Bedrock Zone	0.3m minimum road thickness (ROQ not required) with side slopes to be determined in field.

LEGEND

- BP01 Stake Out Points
- Existing Infrastructure
- Proposed Airstrip Bypass Road
- Streams

NO.	DESCRIPTION	CHK'D	APP'D	CLIENT	DATE
A	ISSUED FOR DISCUSSION	LW	EMR		27SEP10

REFERENCE DRAWINGS: DRAWING NO. | DRAWING TITLE | DRAWING NO. | DRAWING TITLE

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FILE NAME: 04 Bypass Road_Plan and Profile.dwg

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SRK JOB NO.: 1CH008 027 | SRK DWG NO.: DN-AE-04

Doris North Project

DRAWING TITLE:
Airstrip Bypass Road
Plan and Centerline Profile

NEWMONT DRAWING NO.: HB+A-CIV-CIV-AGG-0005 | SHEET: 6 OF 8 | REVISION NO.: A

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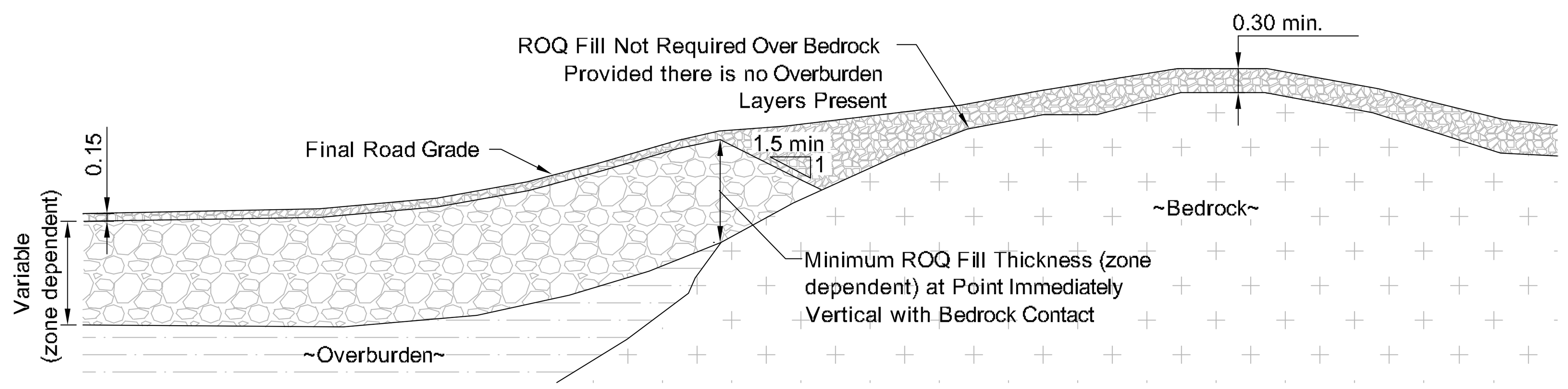
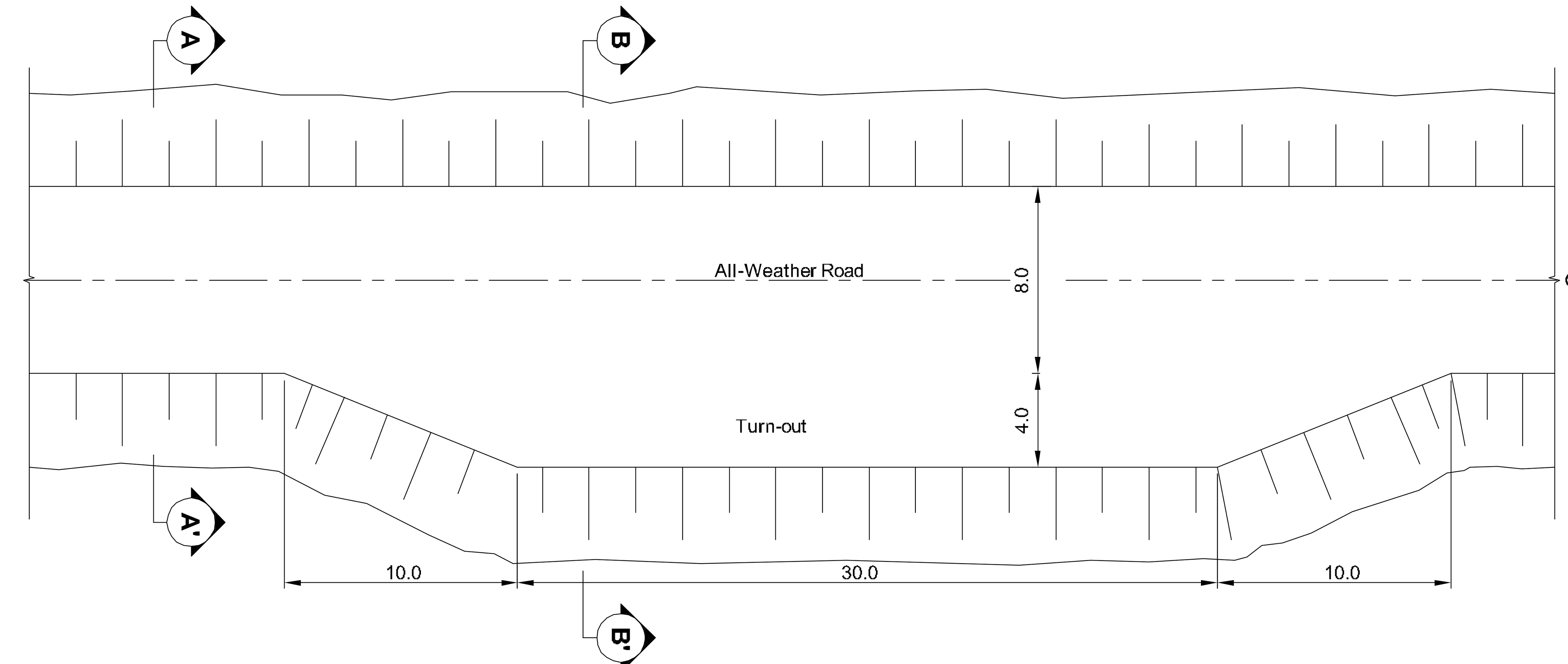


BYPASS ROAD PROFILE
TRANSITION FROM PERMAFROST TO BEDROCK

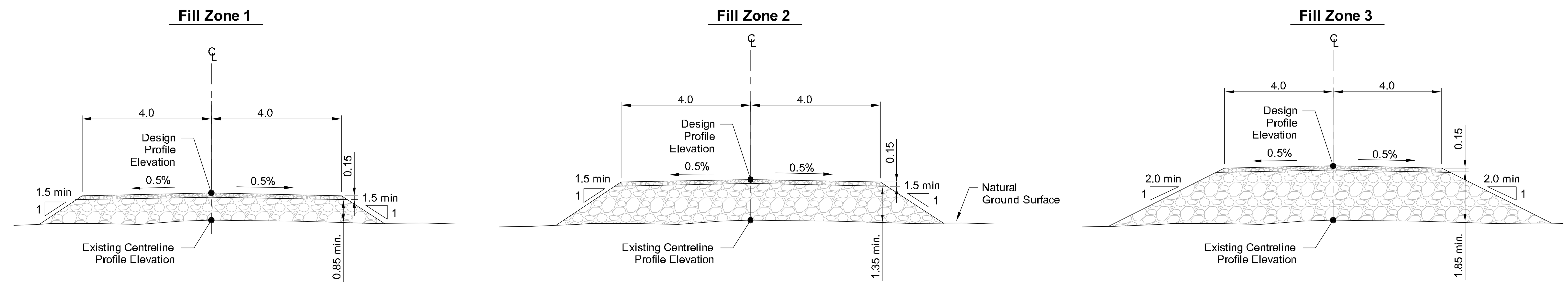
1
DN-AE-05

0 1 2 3 4 5
Scale in Metres



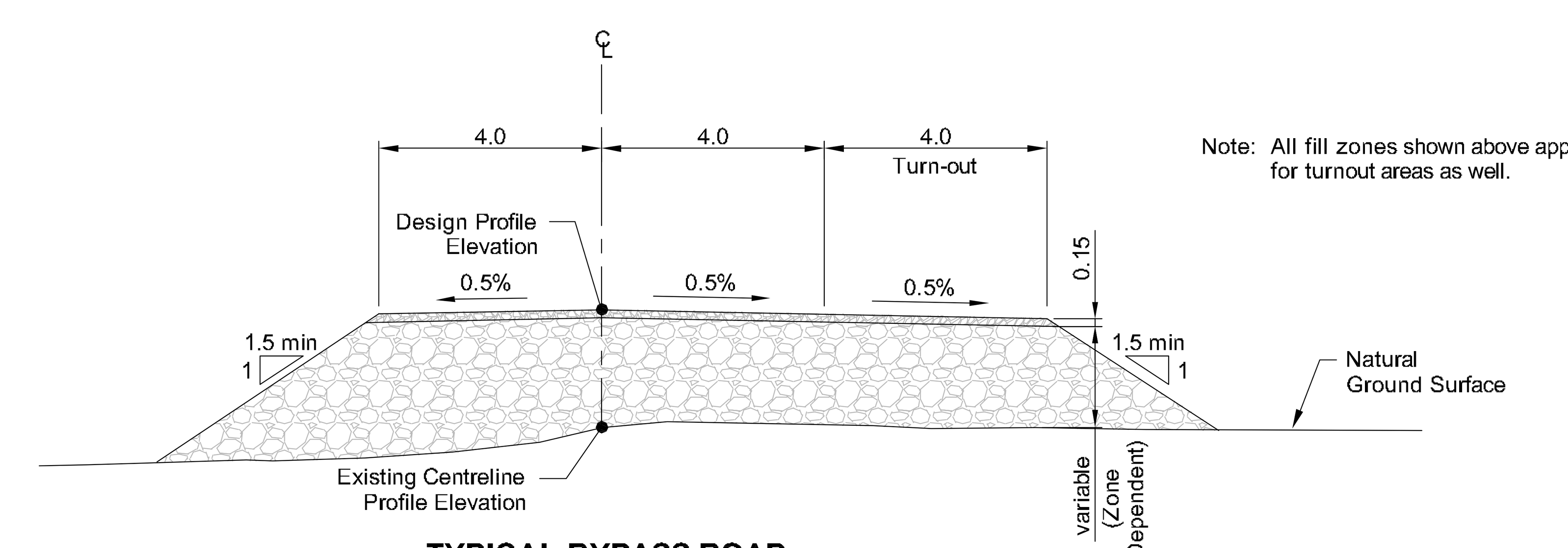
PLAN
TYPICAL BYPASS ROAD & TURNOUT

0 2 4 6 8 10
Scale in Metres



A **TYPICAL BYPASS ROAD SECTION**

0 1 2 3 4 5
Scale in Metres



Note: All fill zones shown above apply for turnout areas as well.

B **TYPICAL BYPASS ROAD WITH TURN-OUT SECTION**

0 1 2 3 4 5
Scale in Metres

LEGEND

Surfacing Material

Run of Quarry Material

NOTES

1. All dimensions in metres unless noted otherwise.
2. Minimum design thickness must be maintained for all sections of the all-weather road including turnouts. See Drawings DN-AE-03 for fill zone chainage intervals.
3. Notes in this drawing apply to all other active drawings.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	CLIENT	DATE
A	ISSUED FOR DISCUSSION	LW	EMR		27SEP10

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DESIGN: MK	DRAWN: LR	REVIEWED: EMR
CHECKED: LW	APPROVED: EMR	DATE: SEPT. 27, 2010

FILE NAME: 05-07 AE - Bypass Rd Sect_Matl.dwg

NEWMONT NORTH AMERICA

HOPE BAY MINING LIMITED

SRK JOB NO.: 1CH008 027
SRK DWG NO.: DN-AE-05

Doris North Project

DRAWING TITLE:
Airstrip Bypass Road
Sections

NEWMONT DRAWING NO.	SHEET	REVISION NO.
HB+A-CIV-CIV-AGG-0006	6 OF 8	A

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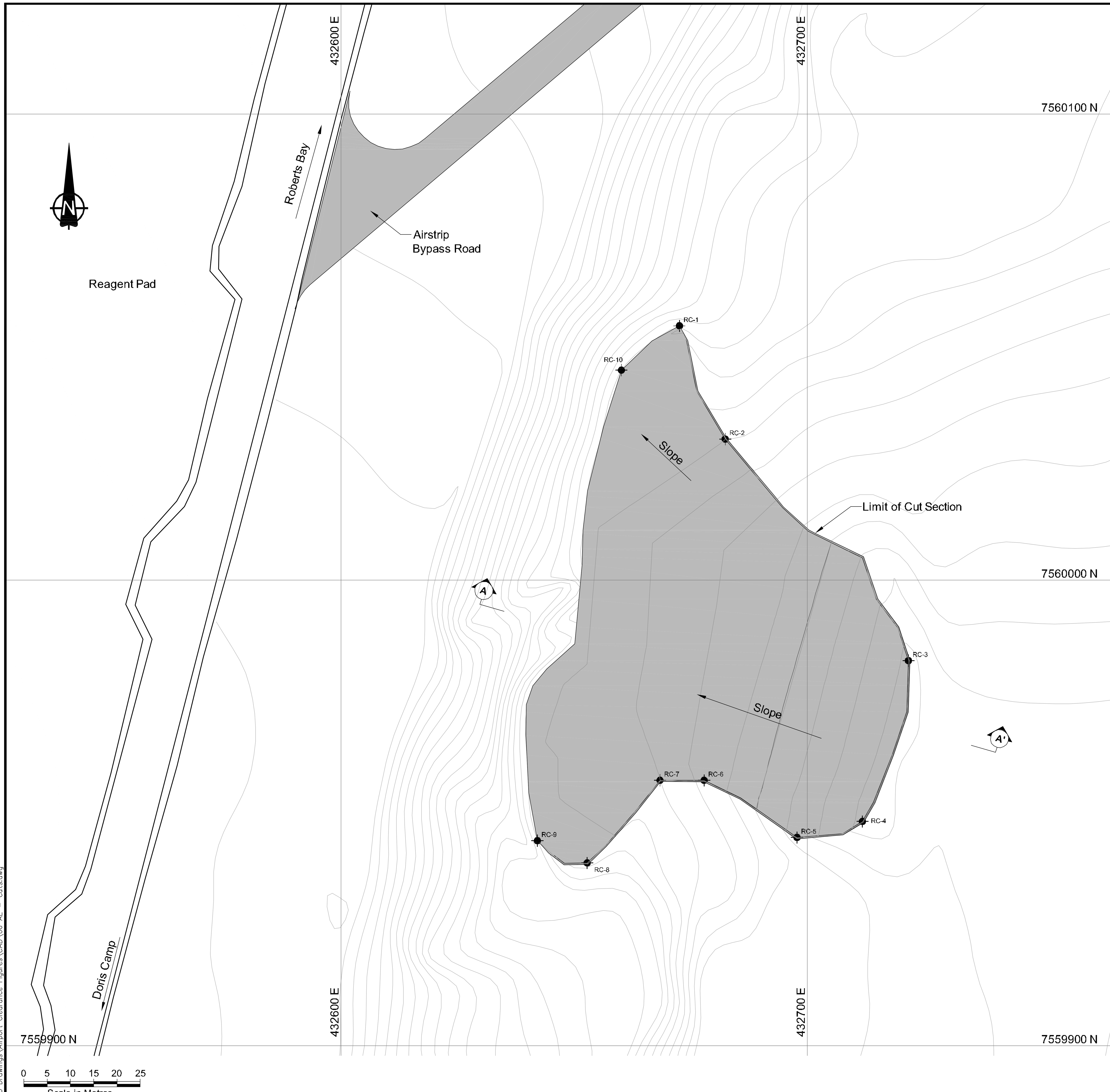


LEGEND

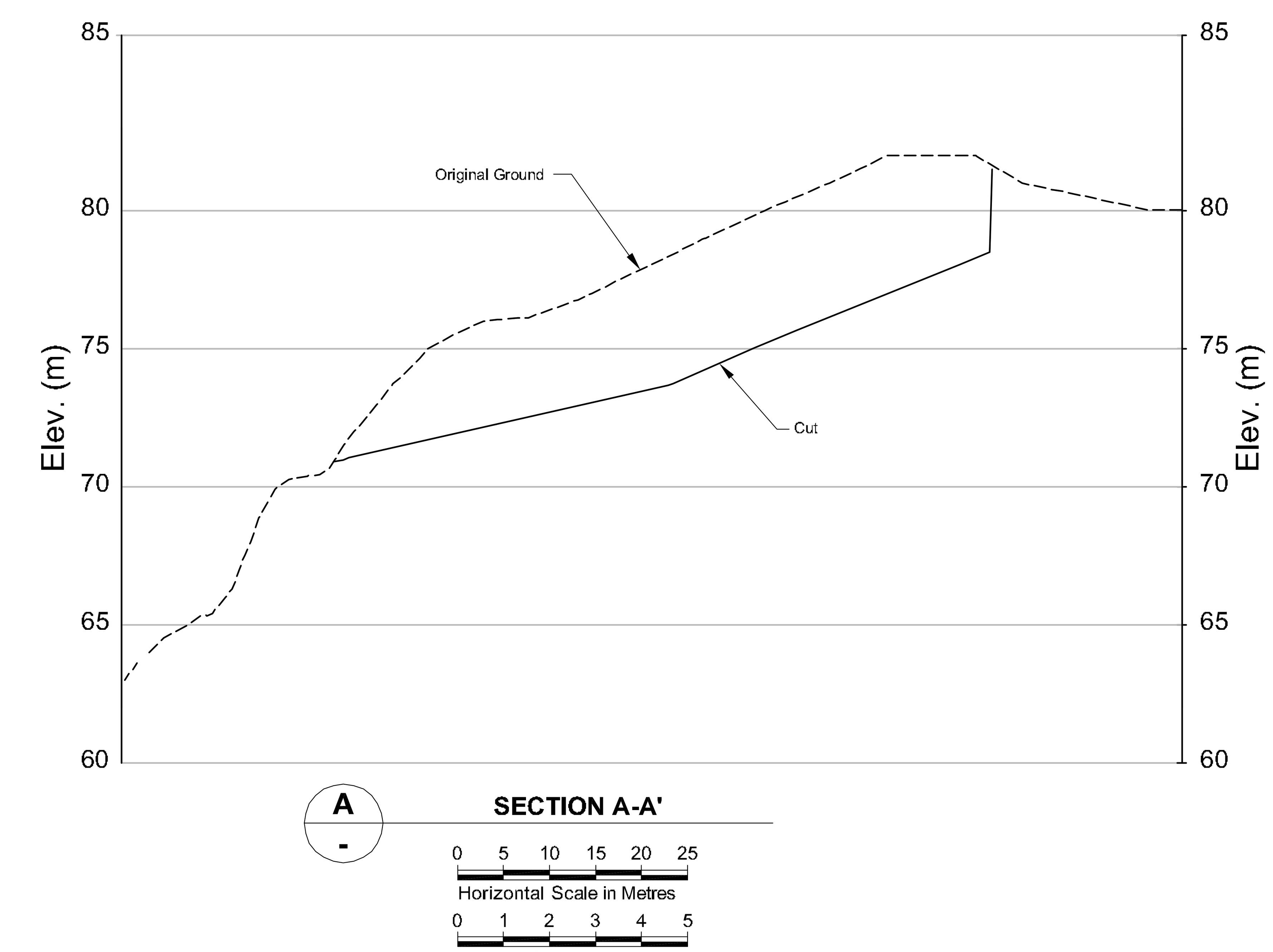
- Stake out points
- Proposed Infrastructure
- Existing Infrastructure

NOTES

1. The Contractor is responsible for creating access to the works in the quarry within the limits as shown on the Drawings.
2. The Contractor shall employ best practices to control at source runoff, fugitive dust, blast vibrations and fly rocks.
3. The Contractor shall ensure the blasted floor have natural drainage. All blasted material shall be excavated to expose intact rock surface for survey and approval by the Engineer. Additional small scale rock breaking or blasting might be required to ensure natural drainage in the intact rock foundation. Once the intact rock surface is surveyed and approved, the Contractor could backfill the floor for traffic and other purposes.
4. The configuration of the cut section shall be blasted within the coordinates and elevation provided in the stakeout table with the criteria that a minimum of 1m shall be maintain between the lowest part of the blasted floor and the original ground around the cut sections. The Contractor shall notify the Engineer immediately if there are any discrepancies to the specifications.
5. Notes in this drawing apply to all other active drawings.

Cut Stake Out Table

ID	Easting	Northing
RC-1	432672.58	7560054.55
RC-2	432682.42	7560030.23
RC-3	432721.75	7559982.69
RC-4	432711.86	7559948.18
RC-5	432697.83	7559944.76
RC-6	432677.89	7559957.01
RC-7	432668.42	7559957.02
RC-8	432652.80	7559939.25
RC-9	432642.10	7559944.05
RC-10	432660.14	7560045.05



NO.	DESCRIPTION	CHK'D	APP'D	CLIENT	DATE
A	ISSUED FOR DISCUSSION	LW	EMR		27SEP10

REVISIONS

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

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DESIGN: MK | DRAWN: LR | REVIEWED: EMR
CHECKED: LW | APPROVED: EMR | DATE: SEPT. 27, 2010
FILE NAME: 06 AE – Cuts.dwg

HOPE BAY MINING LIMITED

SRK JOB NO.: 1CH008 027 | SRK DWG NO.: DN-AE-06

Doris North Project

DRAWING TITLE:
Cut Development Plan

NEWMONT DRAWING NO.: HB+A-CIV-CIV-AGG-0007 | SHEET 7 OF 8 | REVISION NO. A

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NOTES

1. Soil classification for these works are based on the Unified Soil Classification System (USCS).
2. On bare tundra surfaces the maximum snow thickness allowed prior to fill placement shall be 102mm (4"). On all other surfaces complete snow removal is required. The Engineer must approve all surfaces prior to placement of any construction material.
3. Snow and ice on construction material must be removed prior to loading for construction use.
4. Due care must be taken when placing fill materials such that no damage occurs to the subgrade and/or culverts. Any damage must be immediately reported to the Engineer.
5. In areas where staged construction is required, each subsequent lift must be adequately keyed in to the preceding lift. The Engineer will approve such staged construction (see references).
6. Run of Quarry, and Surfacing material has to be compacted after placement.
7. Compaction will be a field specification, based on trial compaction tests to be carried out by the Contractor to the satisfaction of the Engineer.
8. It is the Contractor's responsibility to create the construction materials as specified through appropriate crushing. Any deviations must be approved by the Engineer.
9. Construction fill material shall be from approved rock quarries, shall be non-acid generating, free of organic material or similar impurities, as well as snow and ice.
10. Construction fill material must be free of overburden soils including silt, sand, and clay. Such unsuitable material shall be disposed of in a designated on site disposal area as outlined in the Contractors' quarry development plan.
11. Construction fill material will not have to be washed to remove blast residues or fines, unless specifically instructed by the Engineer.
12. Run of Quarry (ROQ) shall be well-graded, containing sufficient quantities of gravel, sand, and silt sized material. For fill thickness <0.85m the maximum boulder size shall not exceed 500mm. For fill thickness >0.85m the maximum boulder size shall not exceed 900mm.
13. Surfacing material shall be a well-graded manufactured crush product produced from ROQ material. The screen size shall be no greater than 51mm (2") but no smaller than 32mm ($1\frac{1}{4}$").
14. 3/4" Finishing Material shall be well graded manufactured crush product produced from ROQ material. The screesize shall be no greater than 32mm (1-1/4") but no smaller than 19mm (3/4").
15. ROQ material shall be visually inspected by the Engineer on a routine basis and the Contractor will be advised if the material does not meet the specification in Note 16.
16. The Contractor shall collect samples of the surfacing material directly from the crusher stockpile and submit for laboratory testing including but not limited to grain size distribution, and moisture content at least 1 sample every 8,000m³. The Engineer may conduct additional sampling and testing as deemed necessary.
17. Sample collection and testing of ROQ, and surface material for geochemical suitability is required and will be carried out by the Site Environmental Manager in accordance with procedures developed by SRK.

Materials List and Quantities

Item	Quantity / Area / Volume	Description
1. Run of Quarry Material	Road: 48,450m^3 Turnouts (8): 1,950m^3 Airstrip: 396,400m^3 Aprons: 37,300m^3 Total: 484,100m^3	Approximate In-Place neat line volume estimates.
2. Surfacing Material	Road: 3,450m^3 Turnouts (8): 250m^3 Airstrip: 22,400m^3 Aprons: 5,800m^3 Total: 31,900m^3	Approximate In-Place neat line volume estimates.
4. 3/4" Finishing Material	Airstrip: 12,400m^3 Aprons: 2,400m^3 Total: 14,800m^3	Approximate In-Place neat line volume estimates.

Airstrip Expansion Stake Out Points

ID	Northing	Easting
AE01	7562495.86	433140.03
AE02	7562518.23	433034.50
AE03	7562438.13	433017.52
AE04	7562425.49	433077.20
AE05	7560665.57	432704.24
AE06	7560678.22	432644.57
AE07	7560618.67	432631.95
AE08	7560596.27	432736.58
AE09	7562047.57	433044.82
AE10	7562057.27	432999.17

Bypass Road Stake Out Points

ID	Northing	Easting
BP01	7562754.26	433144.11
BP02	7562554.50	433232.17
BP03	7562165.24	433152.06
BP04	7561594.36	433028.64
BP05	7561018.46	432869.49
BP06	7560269.81	432751.37
BP07	7560068.10	432592.71

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DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	CLIENT	DATE
A	ISSUED FOR DISCUSSION	LW	EMR		27SEP10

REVISIONS

PROFESSIONAL ENGINEERS STAMP

SRK Consulting
Engineers and Scientists
Vancouver

NEWMONT NORTH AMERICA

DESIGN: MK	DRAWN: LR	REVIEWED: EMR
CHECKED: LW	APPROVED: EMR	DATE: SEPT. 27, 2010

FILE NAME: 05-07 AE – Bypass Rd Sect_Matl.dwg

HOPE BAY MINING LIMITED

SRK JOB NO.: 1CH008 027 | SRK DWG NO.: DN-AE-07

Doris North Project

DRAWING TITLE: Material Specifications

NEWMONT DRAWING NO.: HB+A-CIV-CIV-AGG-0008 | SHEET: 8 OF 8 | REVISION NO.: A

Attachment B
Geochemical Characterization and Recommendations Memo (SRK, June 2010)

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Memo

To:	Chris Hanks, Newmont	**Date:**	June 8, 2010
cc:	Lea-Marie Bowes-Lyon, Newmont	**From:**	Lisa Barazzuol Kelly Sexsmith
Subject:	Geochemical Characterization and Recommendations for Quarry 5, Doris North, Hope Bay Project	**Project #:**	1CH008.029.3600

1 Introduction

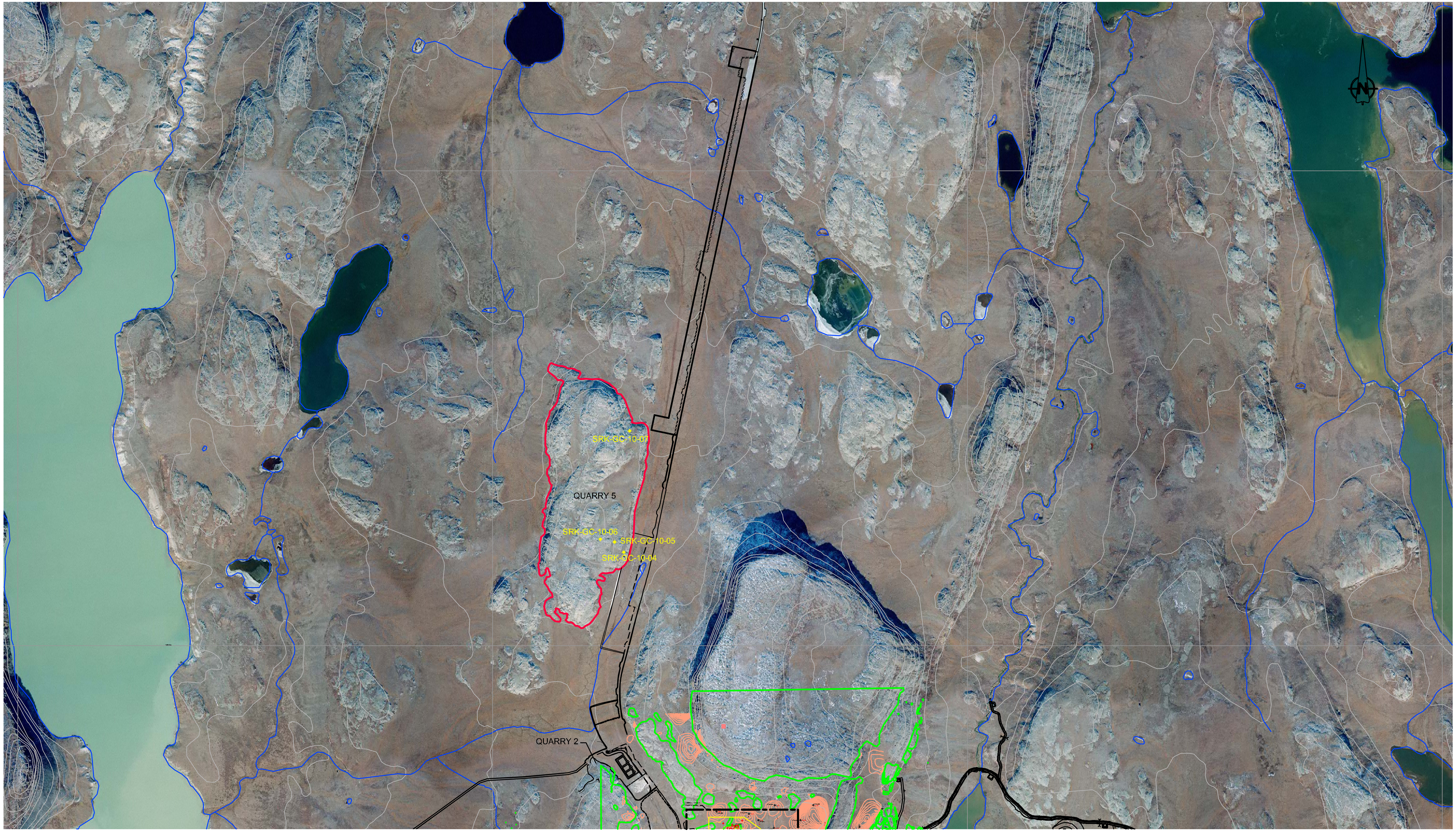
Hope Bay Mining Ltd. (HBML) is seeking permission for the Nunavut Water Board (NWB) to develop an additional quarry (Quarry 5), located south of the Doris airstrip and north of the developed Quarry 2 (Figure 1). Development of this facility would involve blasting and removal of rock for the purposes of approved construction at Doris North.

SRK was asked to characterize the potential for metal leaching and/or acid rock drainage (ML/ARD) of the rock that will be exposed or removed from this area. Samples were obtained and characterized both geologically and geochemically. This memorandum presents results of the testing program and provides recommendations for management and monitoring of this material. Results are also evaluated and compared to previous studies for Quarries 1, 2 and 4 (AMEC 2005, SRK 2007 and SRK 2009).

2 Methods

Four geochemical drillholes were drilled within the eastern extent of Quarry 5 footprint in February 2010 to confirm the sub-surface geology of the development area (Figure 1). Drillhole collar locations were selected based on review of geology outcrop maps. The eastern extent of the quarry was the focus of the geochemical investigation because according to SRK design engineers, material from this area would be targeted for ease of development. All holes were drilled using an Atlas Copco D9 ROC drill. The holes were drilled to the projected depth of development. Rock chip samples weighing approximately 2 kg each were collected by an SRK engineer. A total of 37 samples were collected, each sample representing approximately 1 m of drill core. The rock chips were logged by a Newmont geologist using standardized Newmont lithology codes (Attachment 1).

Samples were submitted to CANTEST Ltd., in Burnaby BC for testing. A total of 30 samples were analyzed for total sulphur. Thirteen of these samples were initially analyzed for trace element analysis by aqua regia digestion and ICP-MS finish, and complete ABA analysis including: paste pH, total inorganic carbon (TIC), sulphate sulphur and Modified Sobek neutralization potential (NP). The samples selected for testing were intended to provide adequate spatial distribution and to represent the range of geological characteristics described in the geology logs. Upon review of the total sulphur data, seven additional samples were submitted for trace element analyses and complete ABA on the basis of the total sulphur content (greater than 0.1%). QA/QC of the data was performed by SRK.



LEGEND

Geochemical Drill Hole

0 100 200 300 400 500

Scale in Metres

SRK Consulting
Engineers and Scientists
Vancouver B.C.

NEWMONT
The Gold Company

SRK JOB NO.: 1CH008.029.3600

FILE NAME: Doris–RobertsB Camp Drill Sites Geochem.dwg

HOPE BAY MINING LTD.

Doris North Phase 1 Infrastructure

Quarry 5
Drill Hole Locations

DATE:	APPROVED:	FIGURE:
April 2010	LB	1

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3 Results

ABA and trace metal data are presented in Attachments 2 and 3.

The geology was lithologically consistent with all samples logged as metavolcanic (1). One sample was a mixture of metavolcanic and early metasediments (5a). The geology of Quarry 5 samples was consistent with other previously developed quarries, such as Quarries 1, 2 and 4.

Total sulphur concentrations for the 30 samples were low, ranging from below detection (0.02%) to 0.84% (median 0.09%). The sample with the highest sulphur content contained the metasedimentary fraction (5a). These sulphur levels are within the range (0.02 to 0.85%) of the 58 mafic volcanic samples from Quarries 1, 2 and 4 (AMEC 2005 and SRK 2007) and 74 post-construction monitoring samples from Quarry 1 (SRK 2009), all of which have been previously reported to the NWB. Visual pyrite estimates of up to 3 to 5% were noted by the geologist, however analytical total sulphur levels were lower, with values of 0.16% and 0.84%, respectively.

Table 1 presents data for the 20 samples submitted for full ABA analysis. As noted previously, thirteen of these were randomly selected, while seven were selected on the basis of sulphur content of greater than 0.1%, which may result in some bias in the sulphur content, AP and NP/AP ratios of these samples. NPs were relatively low in comparison to existing metavolcanic samples from Doris North quarries, ranging from 12 to 209 kg $CaCO_3$/tonne (median 16 kg $CaCO_3$/tonne). TICs levels ranged from 2 to 209 kg $CaCO_3$/tonne (median 3 kg $CaCO_3$/tonne). TIC levels were rougly equal to NP for values greater than or equal to 115 kg$CaCO_3$/tonne (Figure 2). Below this value, TIC levels were uniformly lower than NP.

On the basis of NP/AP ratios, 19 samples were classified[1] as not potentially acid generating (not-PAG), and one sample was classified as uncertain (Figure 3). Also shown in Figure 3 is a rough correlation between total sulphur and NP, which indicates that samples with higher sulphur content tend to have somewhat higher NP. On the basis of TIC/AP ratios, eight samples were classified as not-PAG, six samples were classified as uncertain and six as PAG (Figure 4). The uncertain to PAG samples typically had low sulphur levels (0.05 to 0.16%), except one sample classified as uncertain (0.41%). This latter sample represents a narrow (1 m) interval of elevated sulphur. The low sulphur content in the other uncertain to PAG samples (0.05 to 0.12%) suggests the potential for acid generation is limited. By comparison, mafic volcanic samples from the other Doris North quarries were classified as consistently not-PAG.

The apparent discrepancy in the ARD classifications by these two methods (NP/AP ratios vs TIC/AP ratios) is due to the low levels of carbonate minerals, as indicated by the TIC content, and the more appreciable amounts of non-carbonate buffering minerals, as indicated by the higher levels of NP. Given the overall low sulphide content of these samples, these differences are not considered to be important, and buffering by silicate minerals is likely to be adequate for maintaining neutral pH conditions.

[1] ARD classifications as follows: not-PAG defined as NP/AP or TIC/AP > 3; uncertain defined as NP/AP or TIC/AP between 1 and 3; PAG defined as NP/AP or TIC/AP ≤ 1

Table 1: ABA Data, 13 Samples from Quarry 5

Sample ID	Paste pH	Total Sulphur	Sulphate Sulphur	AP	Modified NP	TIC	NNP	NP/AP	TIC/AP
	s.u.	%	%	kg $CaCO_3$/tonne				ratio	ratio
540410	9.39	0.05	<0.01	1.6	15.4	2.7	13.8	9.8	1.7
540411*	8.26	0.47	<0.01	14.7	96.5	67.5	81.8	6.6	4.6
540412	8.76	0.44	<0.01	13.8	202.7	193.4	189.0	14.7	14.1
540413*	8.90	0.35	<0.01	10.9	104.4	80.7	93.4	9.5	7.4
540414	9.15	0.68	0.01	20.9	208.9	208.4	188.0	10.0	10.0
540415	9.34	0.05	<0.01	1.6	13.1	3.2	11.6	8.4	2.0
540417	8.41	0.84	0.01	25.9	142.4	134.1	116.4	5.5	5.2
540419	9.39	0.06	<0.01	1.9	12.0	1.8	10.1	6.4	1.0
540422	9.43	<0.02	<0.01	0.6	11.8	2.5	11.1	18.8	4.0
540425	9.23	0.02	<0.01	0.6	20.3	5.0	19.6	32.4	8.0
540429	9.33	0.12	<0.01	3.8	22.3	3.0	18.5	5.9	0.8
540433	8.49	0.07	<0.01	2.2	116.3	115.0	114.1	53.1	52.6
540434*	8.50	0.41	<0.01	12.8	32.5	16.4	19.7	2.5	1.3
540435*	9.32	0.14	<0.01	4.4	31.0	6.8	26.6	7.1	1.6
540437	9.26	0.15	<0.01	4.7	14.6	3.2	9.9	3.1	0.7
540438*	9.19	0.16	<0.01	5.0	17.9	4.3	12.9	3.6	0.9
540439*	9.09	0.14	<0.01	4.4	24.0	3.4	19.6	5.5	0.8
540441	9.32	0.08	<0.01	2.5	15.8	3.0	13.3	6.3	1.2
540443*	9.09	0.12	<0.01	3.8	20.6	3.0	16.9	5.5	0.8
540445	9.53	0.09	<0.01	2.8	18.6	3.4	15.8	6.6	1.2

Notes: * indicates samples specifically selected on the basis of total sulphur > 0.1%.

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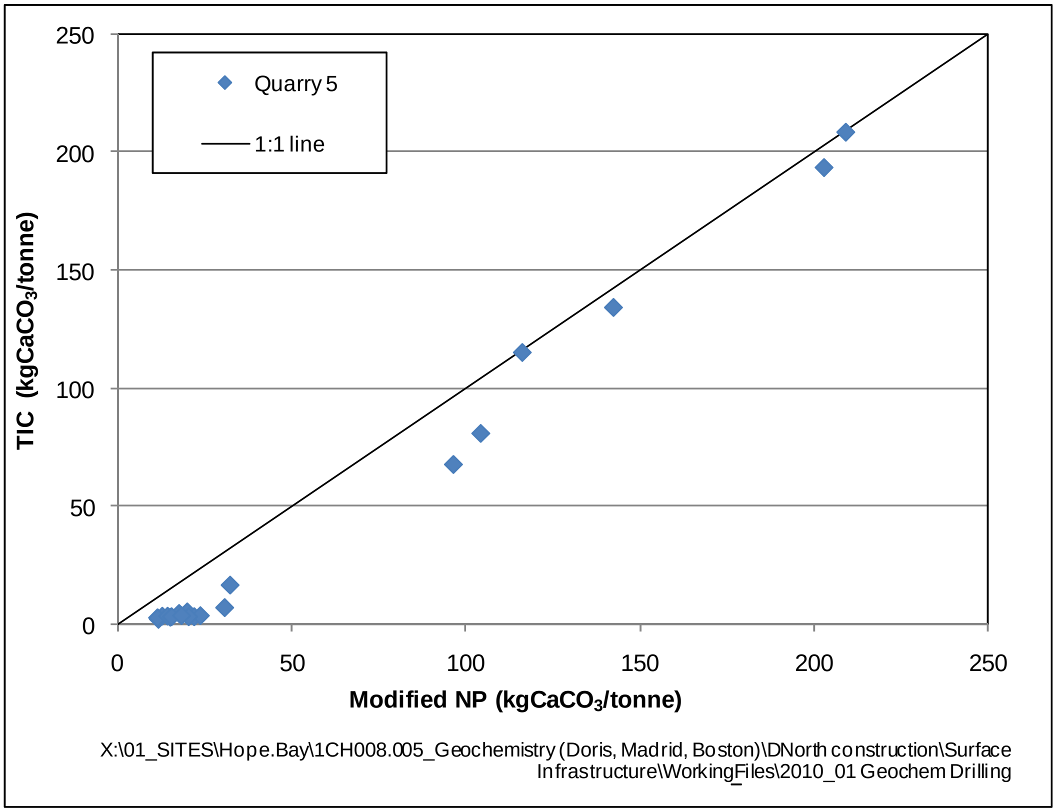

Figure 2: Comparison of NP and TIC, Quarry 5 Samples

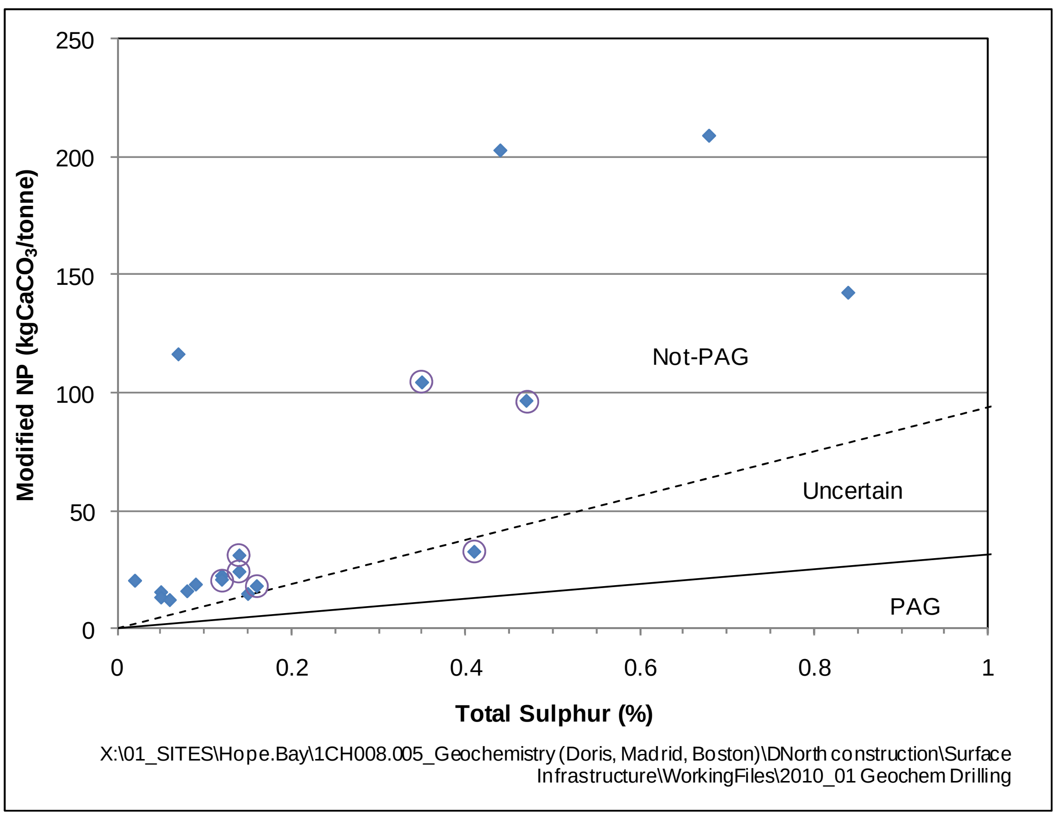

Figure 3: ARD Classifications based on NP/AP (Total Sulphur), Quarry 5 Samples

Circles denote samples that were selected based on a total sulphur content greater than 0.1%

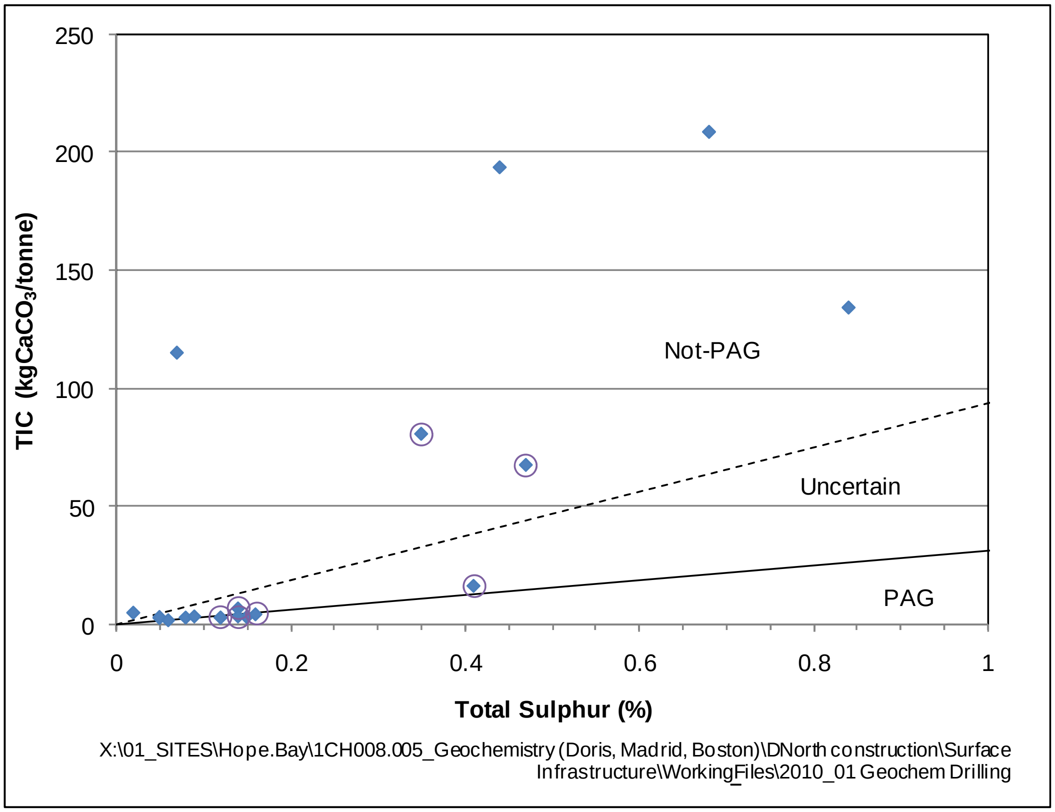

Figure 4: ARD Classifications based on TIC/AP (Total Sulphur)

Of the 20 samples analyzed for trace metals, two samples had silver levels greater than ten times the average crustal abundance for basaltic rocks (Price 1997). Mercury and selenium could not be assessed because detection limits were high. All other trace elements were less than ten times the average crustal abundance threshold, indicating there was no appreciable enrichment in these rocks.

4 Summary and Recommendations

The Quarry 5 samples were consistently logged as mafic volcanic, which is the same rock type as the construction material from most of the existing quarries (e.g. Quarries 1, 2 and 4). One sample was a mixture of mafic volcanic and early metasediments (5a).

Total sulphur levels (median 0.09%) were comparable to previously reported data for mafic volcanics from Quarries 1, 2 and 4 (AMEC 2005, SRK 2007 and SRK 2009). The sample with the sedimentary component contained the highest sulphur levels (0.84%). NP and TIC levels were generally lower in Quarry 5 samples compared with existing samples for mafic volcanics in the area.

Samples were generally classified as not-PAG with one sample as uncertain on the basis of NP/AP ratios, and not-PAG, uncertain or PAG by TIC/AP ratios. All but one of the samples classified as uncertain or PAG by TIC/AP ratios had low (< 0.16%) sulphur levels, which suggests a limited potential for acid generation even using this more conservative classification method.

Special management plans are not required to prevent acidic drainage from developing in this material. SRK recommends a monitoring program to verify the characteristics of these materials following construction. The program would include visual inspection and sampling of both solid materials and seepage flowing from infrastructure, as has already been conducted for the existing Doris North camp, airstrip and roads (SRK 2009).

5 References

AMEC 2005. ARD and Metal Leaching Characterization Studies in 2003 – 2005, Doris North Project, Nunavut, Canada. Report prepared for Miramar Hope Bay Mining Ltd. by AMEC Earth & Environmental, October 2005.

Price 1997. Guidelines and Recommended Methods for the Prediction of Metal Leaching and Acid Rock Drainage at Minesites in British Columbia, DRAFT. British Columbia Ministry of Employment and Investment, April 1997.

SRK 2007. Geochemical Characterization of Quarry Materials, Doris North Project, Hope Bay, Nunavut, Canada (Revised March 2007). Report prepared for Miramar Hope Bay Ltd. by SRK Consulting, March 2007.

SRK 2009. Hope Bay Project Quarry Monitoring. Report prepared for Hope Bay Mining Ltd. by SRK Consulting, November 2009.

Prepared by	Reviewed by
Lisa Barazzuol, G.I.T (BC) Environmental Geochemist	Kelly Sexsmith, P.Geo. (BC) Principal Environmental Geochemist

Attachment 1
Geology Logs for Quarry 5 Drillholes

Attachment 1: Geology Logs for Quarry 5 Geochemistry Drill Holes

Hole	From (m)	To (m)	Sample ID	Lithology Code	Sulphides	C-type or A-type?	Geological Description
SRK-GC-10-04	0.0	1.0	540410	1a	?	--	Medium grained light green unfoliated basalt, plus mm scale white calcite veinlets, which have associated anhedral pyrite. No calcite in rock proper. No fizz except for Veinlets; minor epidote
SRK-GC-10-04	1.0	2.0	540411	1a	1% pyrite	--	Fine to medium grained foliated basalt with 1% blebby pyrite & 10% orange mineral (albite?) + quartz, mm to 2mm scale veinlets; No fizz.
SRK-GC-10-04	2.0	3.0	540412	1a	1% pyrite	--	Medium grained foliated basalt with 1% pyrite and mm scale quart veinlets; no fizz.
SRK-GC-10-04	3.0	4.0	540413	1a	2% pyrite	--	Mix: 30% magnetite-rich, fine grained dark grey, hematite stained, basalt + 70% medium grained foliated basalt with 2% blebby pyrite. No fizz.
SRK-GC-10-04	4.0	5.0	540414	1a	2% pyrite	--	Mix: 30% magnetite-rich, fine grained dark grey, hematite stained, basalt + 70% medium grained foliated basalt with 2% blebby pyrite. No fizz
SRK-GC-10-05	0.0	1.0	540415	1a	0	--	Medium grained light green basalt, no pyrite, unfoliated. No fizz.
SRK-GC-10-05	1.0	2.0	540416	1a	0	--	Medium grained light green unfoliated basalt- minor epidote. No fizz.
SRK-GC-10-05	2.0	3.0	540417	1a/5a	1-5% pyrite	--	Mix: 15% very fine dark brownish grey rock (siltstone?) With 5% ultra fine euhedral pyrite. 85% well foliated medium grained basalt with 1% fine blebby pyrite. No fizz in either.
SRK-GC-10-05	3.0	4.0	540418	1a	Trace Pyrite	--	Medium grained light green unfoliated basalt, with trace blebby pyrite. No fizz.
SRK-GC-10-05	4.0	5.0	540419	1a	0	--	Medium grained light green unfoliated basalt, no pyrite. No fizz.
SRK-GC-10-06	0.0	1.0	540420	1a	Trace Pyrite	--	Fine light green unfoliated basalt with trace very fine pyrite. Minor epidote. No fizz.
SRK-GC-10-06	1.0	2.0	540421	1a	Trace Pyrite	--	Fine light green unfoliated basalt with trace very fine pyrite. Minor epidote. No fizz.
SRK-GC-10-06	2.0	3.0	540422	1a	Trace Pyrite	--	Fine light green unfoliated basalt with trace very fine pyrite. Minor epidote. No fizz.
SRK-GC-10-06	3.0	4.0	540423	1a	Trace Pyrite	--	greenish-grayish fine basalt with trace fine pyrite. No fizz; trace hematite within small cracks.
SRK-GC-10-06	4.0	5.0	540424	1a	1% pyrite	--	greenish-grayish fine basalt with 10% mm scale Hematite + orange quartz veinlets & 1% blebby pyrite. No fizz.
SRK-GC-10-07	0.0	1.0	540425	1a	trace pyrite	--	Medium grained dark green, well foliated basalt with trace magnetite (?) & trace pyrite. Minor hematite staining. No fizz.
SRK-GC-10-07	1.0	2.0	540426	1a	0.5% pyrite	--	Medium grained dark green, well foliated basalt with trace magnetite; minor orange hairline veinlets with blebby pyrite (0.5%)
SRK-GC-10-07	2.0	3.0	540427	1a	trace pyrite/0.5% in velts	--	Medium grained dark green, well foliated basalt with trace magnetite (?) & trace pyrite. Minor hematite staining. No fizz. minor orange hairline velts which containt blebby pyrite (0.5% locally)
SRK-GC-10-07	3.0	4.0	540428	1a	--	--	Medium grained dark green, well foliated basalt with trace magnetite, no veinlets.
SRK-GC-10-07	4.0	5.0	540429	1a	2% pyrite	--	Medium grained dark green, well foliated basalt with trace magnetite and with orange hairline Vlets & 2% blebby pyrite. No fizz.
SRK-GC-10-07	5.0	6.0	540430	1a	trace pyrite	--	Medium grained dark green, well foliated basalt with trace magnetite, with hairline orange vlets but only trace pyrite. No fizz.
SRK-GC-10-07	6.0	7.0	540431	1a	0	--	Mix: 80% Medium grained dark green well-foliated basalt, no pyrite. 20% un-foliated fine basalt. No fizz.
SRK-GC-10-07	7.0	8.0	540432	1a	--	--	medium grained, weakly foliated basalt with 20% white orange (feldspar?) mm scale vlets. No fizz.
SRK-GC-10-07	8.0	9.0	540433	1a	0	--	Mix: 60% white vein quartz chips + 40% medium grained, weakly foliated basalt. no pyrite. No fizz.
SRK-GC-10-07	9.0	10.0	540434	1a	2% pyrite	--	Mix: 40% medium grained weakly foliated basalt, with 2% pyrite, hematite stains on cracks. 60% fine unfoliated basalt with trace pyrite. No fizz.
SRK-GC-10-07	10.0	11.0	540435	1a	trace pyrite	--	Medium grained dark green, foliated basalt, trace pyrite. No fizz.
SRK-GC-10-07	11.0	12.0	540436	1a	trace pyrite	--	Medium grained dark green, foliated basalt. 5% mm scale orange quartz veinlets, trace pyrite. No fizz.
SRK-GC-10-07	12.0	13.0	540437	1a	2% pyrite	--	medium grained dark green foliated basalt, 2% pyrite, 5% orange quartz veinlets at mm scale.

Attachment 1: Geology Logs for Quarry 5 Geochemistry Drill Holes

Hole	From (m)	To (m)	Sample ID	Lithology Code	Sulphides	C-type or A-type?	Geological Description
SRK-GC-10-07	13.0	14.0	540438	1a	3% pyrite	--	medium grained dark green foliated basalt, 3% anhedral pyrite, no fizz.
SRK-GC-10-07	14.0	15.0	540439	1a	trace pyrite	--	medium grained dark green foliated basalt. Coarsening downwards, trace pyrite. No fizz.
SRK-GC-10-07	15.0	16.0	540440	1a	trace pyrite	--	medium grained dark green foliated basalt. Trace pyrite. No fizz.
SRK-GC-10-07	16.0	17.0	540441	1a	trace pyrite	--	medium grained dark green foliated basalt. Trace pyrite. No fizz.
SRK-GC-10-07	17.0	18.0	540442	1a	trace pyrite	--	medium grained dark green foliated basalt, with trace epidote & trace pyrite. No fizz.
SRK-GC-10-07	18.0	19.0	540443	1a	trace pyrite	--	medium grained dark green foliated basalt. Hematite in cracks, no epidote, trace pyrite. No fizz.
SRK-GC-10-07	19.0	20.0	540444	1a	1% pyrite	--	medium grained dark green foliated basalt, with 1% blebby pyrite, increasingly coarse.
SRK-GC-10-07	20.0	21.0	540445	1a	1% pyrite	--	medium grained dark green foliated basalt, with 1% blebby pyrite
SRK-GC-10-07	21.0	22.0	540446	1a	1% pyrite	--	medium grained dark green foliated basalt, with 1% blebby pyrite

Attachment 2

Total Sulphur and ABA Data for Quarry 5 Samples

Attachment 2: Total Sulphur and ABA Data for Quarry 5 Samples

Rush report on 22 samples: 12-Mar-10. Final report: 19-Mar-10. 14 samples (ID's bolded): 10-May-10.

Table 1: ABA Test Results for 41 and Total Sulphur Results for 126 (of 172) SRK-Hopebay (Doris Camp samples) Pulp Samples - March 2010

S. No.	Sample ID	Paste pH	Acme CO2 (Wt.%)	CaCO3 Equiv.* (Kg CaCO3/Tonne)	Acme Total Sulphur (Wt.%)	Sulphate Sulphur (Wt.%)	Sulphide Sulphur** (Wt.%)	Maximum Potential Acidity*** (Kg CaCO3/Tonne)	Mod. ABA NP Neutralization Potential (Kg CaCO3/Tonne)	Net Neutralization Potential**** (Kg CaCO3/Tonne)	Fizz Rating
32	540410	9.4	0.12	2.7	0.05	<0.01	0.05	1.6	15.4	13.8	Slight
33	**540411**	8.3	2.97	67.5	0.47	<0.01	0.47	14.7	96.5	81.8	Moderate
34	540412	8.8	8.51	193.4	0.44	<0.01	0.44	13.8	202.7	189.0	Strong
35	**540413**	8.9	3.55	80.7	0.35	<0.01	0.35	10.9	104.4	93.4	Moderate
36	540414	9.2	9.17	208.4	0.68	0.01	0.67	20.9	208.9	188.0	Strong
37	540415	9.3	0.14	3.2	0.05	<0.01	0.05	1.6	13.1	11.6	None
38	540416				0.08						
39	540417	8.4	5.90	134.1	0.84	0.01	0.83	25.9	142.4	116.4	Moderate
40	540418				0.02						
41	540419	9.4	0.08	1.8	0.06	<0.01	0.06	1.9	12.0	10.1	None
42	540420				<0.02						
43	540422	9.4	0.11	2.5	<0.02	<0.01	<0.02	<0.6	11.8	11.8	None
44	540424				<0.02						
45	540425	9.2	0.22	5.0	0.02	<0.01	0.02	0.6	20.3	19.6	None
46	540426				0.03						
47	540427				0.09						
48	540429	9.3	0.13	3.0	0.12	<0.01	0.12	3.8	22.3	18.5	None
49	540430				0.10						
50	540431				0.10						
51	540433	8.5	5.06	115.0	0.07	<0.01	0.07	2.2	116.3	114.1	Strong
52	**540434**	8.5	0.72	16.4	0.41	<0.01	0.41	12.8	32.5	19.7	Slight
53	**540435**	9.3	0.30	6.8	0.14	<0.01	0.14	4.4	31.0	26.6	None
54	540437	9.3	0.14	3.2	0.15	<0.01	0.15	4.7	14.6	9.9	None
55	**540438**	9.2	0.19	4.3	0.16	<0.01	0.16	5.0	17.9	12.9	None
56	**540439**	9.1	0.15	3.4	0.14	<0.01	0.14	4.4	24.0	19.6	None
57	540441	9.3	0.13	3.0	0.08	<0.01	0.08	2.5	15.8	13.3	None
58	540442				0.06						
59	**540443**	9.1	0.13	3.0	0.12	<0.01	0.12	3.8	20.6	16.9	None
60	540445	9.5	0.15	3.4	0.09	<0.01	0.09	2.8	18.6	15.8	None
61	540446				0.08						

Notes:

Total sulphur and carbonate carbon (CO2; HCl direct method) by Leco done at Acme Labs.

CO2 Analysis: 0.2g of pulp sample is digested with 6 ml of 1.8N HCl in a hot water bath of 70 ˚C for 30 minutes. The CO2 that evolves is trapped in a gas chamber that is controlied with a stopcock, once the stopcock is opened the CO2 gas is swept into the Leco analyser with an oxygen carrier gas. Leco then determines the CO2 as total-carbon which is calculated to total CO2.

Calculations:

*CaCO3 equivalents is based on carbonate carbon.

**Sulphide sulphur is based on difference between total sulphur and sulphate sulphur.

***MPA (Maximum Potential Acidity) is based on sulphide sulphur .

**** NNP (Net Neutralization Potential) is based on difference between Neutralization Potential (NP) and MPA.

References:

Reference for Mod ABA NP method (SOP No. 7150): MEND Acid Rock Drainage Prediction Manual, MEND Project 1.16.1b (pages 6.2-11 to 17), March 1991.

Attachment 3
Trace Metal Data for Quarry 5 Samples

Attachment 3: Trace Metal Data for Quarry 5 Samples

CANTEST
A Maxxam Company

SRK Consulting Inc. - Hopebay, 3-Mar-10

CANTEST Ltd. 4606 Canada Way, Burnaby, BC Canada V5G 1K5 Tel: 604 734 7276 Fax: 604 731 2386 www.cantest.com

Table 3: Trace Metals Using Aqua Regia Digestion with ICP-MS Finish for 41 (of 172) SRK-Hopebay (Doris Camp samples) Pulp Samples - March 2010

S. No.	Sample ID	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Hg ppm	Sc ppm	Tl ppm	S %	Ga ppm	Se ppm	Te ppm
32	540410	0.3	111.4	0.8	53	<0.1	46.5	25.7	564	3.66	<0.5	<0.1	<0.5	<0.1	15	<0.1	<0.1	<0.1	74	1.01	0.022	1	65	1.72	8	0.273	<20	2.36	0.043	0.01	0.3	<0.01	3.2	<0.1	0.05	4	0.7	<0.2
33	540411	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
34	540412	0.7	226.3	2.1	87	<0.1	770.8	86.2	2294	8.25	2.2	0.1	0.8	0.6	13	<0.1	<0.1	<0.1	261	4.37	0.065	11	895	6.53	35	0.539	<20	4.01	0.007	0.03	<0.1	0.01	15.4	<0.1	0.39	16	<0.5	<0.2
35	540413	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	540414	0.5	213.2	2.1	82	<0.1	778.8	91.5	2107	7.79	2.4	0.1	1.8	0.5	19	<0.1	<0.1	<0.1	252	4.51	0.062	11	850	6.07	19	0.551	<20	3.74	0.029	0.02	<0.1	0.01	15.6	<0.1	0.58	15	0.6	<0.2
37	540415	0.3	92.1	0.8	54	<0.1	43.9	24.8	560	3.55	<0.5	<0.1	2.2	<0.1	17	0.1	<0.1	<0.1	70	1.09	0.018	1	68	1.69	6	0.264	20	2.33	0.045	0.01	0.1	<0.01	3.5	<0.1	<0.05	4	<0.5	<0.2
38	540416	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
39	540417	0.5	242.1	2.7	91	<0.1	620.4	88.7	2148	9.11	3	0.1	1.3	0.7	9	<0.1	<0.1	<0.1	273	2.84	0.06	13	748	6.27	6	0.093	<20	4.18	0.002	0.01	<0.1	0.01	16	<0.1	0.74	16	1.1	<0.2
40	540418	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
41	540419	0.4	190.7	0.5	51	<0.1	47.9	26.5	572	3.71	0.7	<0.1	3.3	<0.1	18	<0.1	<0.1	<0.1	74	1.03	0.021	1	71	1.76	22	0.269	<20	2.4	0.05	0.01	0.2	<0.01	3.6	<0.1	0.06	4	<0.5	<0.2
42	540420	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
43	540422	0.4	88.5	0.9	39	<0.1	35.1	20.7	482	3.27	<0.5	<0.1	4.4	<0.1	12	<0.1	<0.1	<0.1	79	1.06	0.025	1	60	1.5	10	0.377	55	2.03	0.051	0.02	<0.1	<0.01	2.6	<0.1	<0.05	4	<0.5	<0.2
44	540424	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
45	540425	0.3	127.6	0.8	85	<0.1	42.8	27.6	739	4.08	<0.5	<0.1	2.2	0.1	13	0.1	<0.1	<0.1	105	1.16	0.025	2	66	2.36	3	0.452	<20	2.64	0.047	0.04	<0.1	<0.01	3.7	<0.1	<0.05	6	<0.5	<0.2
46	540426	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
47	540427	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
48	540429	0.2	117.1	1	50	<0.1	47.7	30.8	737	4.44	0.7	<0.1	1.5	0.1	12	<0.1	<0.1	<0.1	117	0.94	0.027	2	71	2.84	14	0.391	<20	2.87	0.051	0.04	<0.1	0.01	4.8	<0.1	0.12	7	1	<0.2
49	540430	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
50	540431	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
51	540433	0.5	172.8	0.8	82	<0.1	51	29.4	1597	6.03	3.3	<0.1	2	<0.1	7	<0.1	<0.1	<0.1	179	3.48	0.02	2	76	3.85	30	0.007	<20	3.89	0.019	0.1	<0.1	<0.01	13.1	<0.1	0.06	10	0.8	<0.2
52	540434	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
53	540435	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
54	540437	0.8	140.3	1.6	128	0.4	44.3	29.2	667	3.78	<0.5	<0.1	1.7	<0.1	17	<0.1	0.1	<0.1	79	1.04	0.026	1	69	1.81	171	0.384	<20	2.31	0.047	0.01	0.7	<0.01	3.1	0.1	0.16	5	<0.5	<0.2
55	540438	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
56	540439	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
57	540441	0.7	109.9	3.2	160	1.3	42.6	25.7	630	3.64	<0.5	<0.1	1.1	<0.1	12	0.5	0.4	<0.1	82	1.07	0.026	1	64	1.82	52	0.432	<20	2.27	0.042	0.01	0.4	<0.01	3	<0.1	0.08	5	0.7	<0.2
58	540442	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
59	540443	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
60	540445	1	105.7	2.4	89	0.2	47.4	28.6	660	4.03	0.6	<0.1	0.9	<0.1	12	0.1	<0.1	<0.1	97	0.93	0.026	1	71	2.38	59	0.426	<20	2.6	0.055	0.02	0.3	<0.01	3.4	<0.1	0.09	6	<0.5	<0.2
61	540446	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Note:
Analysis done at Acme Labs.

Attachment C
Geochemical Assessment of Rock Cut East of the Runway Memo (SRK, 2010)

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Memo

To:	Chris Hanks, Newmont	**Date:**	September 22, 2010
cc:	Maritz Rykaart, SRK	**From:**	Lisa Barazzuol Kelly Sexsmith
Subject:	Geochemical Assessment of Rock Cut East of the Runway	**Project #:**	1CH008.029

1 Introduction

Hope Bay Mining Ltd. (HBML) is proposing to extend and expand their airstrip at Doris North. To meet the specifications for "Obstacle Limitation Surfaces", as outlined in "*Aerodrome Standards and Recommended Practices*" (Transport Canada 2005), it would be necessary to excavate rock from the outcrop area located to the west side of the airstrip, and from the small knoll southeast of the airstrip (Figure 1).

Rock from the outcrop area to the west is located within the limits of Quarry 5, and has already been characterized geochemically, as reported in SRK (2010a). The small knoll to the southeast is expected to have a cut volume of approximately 20,000 m^3. Geochemical characterization work has not been completed on any specific samples from this location. However, it is in close proximity to Quarries 2, 4 and 5 and is part of the same sequence of rocks. Therefore, it is reasonable to infer that the geochemical characteristics will be the same as the rock from these quarries.

This memo presents a summary of the geological conditions and geochemical results from Quarries 2, 4 and 5 showing that the rock from this general area has a negligible potential for metal leaching and/or acid rock drainage. Although this information is considered sufficient for planning purposes, verification of the geochemistry will be required if the excavation goes ahead.

2 Summary of Geological and Geochemical Information

According to regional mapping, the airstrip cut is within the ultramafic to mafic metavolcanics (1) unit and directly west of the diabase (11c) unit (Figure 1). The airstrip cut is in close proximity to Quarries 2, 4 and 5, each of which are located with the mafic metavolcanic unit and have been geochemically characterized (SRK 2009, SRK 2010a and SRK 2010b). As with the airstrip, the mafic metavolcanics in Quarry 4 are directly adjacent to the diabase unit. The following is a summary of the geochemical characterization of Quarries 2, 4 and 5.

Quarry 2

SRK (2009) presents the monitoring results for construction rock from Quarries 1, 2 and 4 that was excavated during development of the Doris North roads, airstrip and camp area. To meet monitoring commitments, geochemical analysis of the quarried rock used as construction rock was performed. Also, seep surveys were conducted during spring freshet along the roadways, airstrip, building pads and quarry sites.

Results of the ABA tests indicated that all construction materials sampled were not-PAG, which is consistent with the conclusions of the characterization programs completed prior to permitting and development. Also, shake flask extraction (SFE) results indicate the soluble metal content in the rock is low. The results of the seepage survey indicated near neutral pH conditions in all of the seeps and ponded water samples associated with quarry rock. Metal concentrations were generally low with the exception of copper, which was also elevated in reference sites outside the area of interest. The copper concentrations were typically lower than the value found in SFE tests completed prior to development.

Quarry 4

SRK (2010b) summarized the existing geochemical studies for Quarry 4. The sample set was primarily composed of mafic metavolcanics (1), though 13% of the samples contained other rocks types. All 44 samples from Quarry 4 were classified as not-PAG on the basis of NP/AP and TIC/AP ratios. A number of samples contained somewhat elevated levels of sulphur (maximum concentrations of 0.85%), which may be associated with a higher potential for metal leaching. Results were generally consistent with the results presented in the water licence application. Special management of these materials was not recommended.

Quarry 5

The 20 samples classified using ABA from Quarry 5 were generally classified as not-PAG with one sample as uncertain on the basis of NP/AP ratios, and either not-PAG, uncertain or PAG by TIC/AP ratios (SRK 2010a). All but one of the samples classified as uncertain or PAG by TIC/AP ratios had low (< 0.16%) sulphur levels, which suggests a limited potential for acid generation even using this more conservative classification method. Special management of these materials was not recommended.

3 Conclusions and Recommendations

The small rock cut to the southeast of the airstrip has not been characterized, but its geochemical characteristics are expected to be the same as other mafic volcanic in this general area based on the following rationale:

- Quarries 2, 4 and 5 are considered representative of the airstrip cut on the basis of geology (mafic metavolcanics (1)) and proximity.
- Geochemical characterization of Quarries 4 and 5 materials concluded that the samples were not-PAG and no special management plans were necessary.
- Seepage and solids monitoring of *in situ* construction rock from Quarry 2 indicated the material was not-PAG, near neutral conditions were present and metal concentrations were generally low.

On this basis, SRK concludes that removal of rock from the outcrop area is not likely to result in any geochemical issues. However, some additional work will be required prior to actual blasting and removal to verify this conclusion. Specifically, this program would need to include visual inspection, sampling and testing of the rock prior to excavation. Assuming that the results are consistent with that of other rocks in the area, this material could be used for construction. If any of the rock is classified as potentially acid generating, then it could be placed in the waste rock storage facility, and managed according to the protocols proposed for potentially acid generating rock from the underground workings.

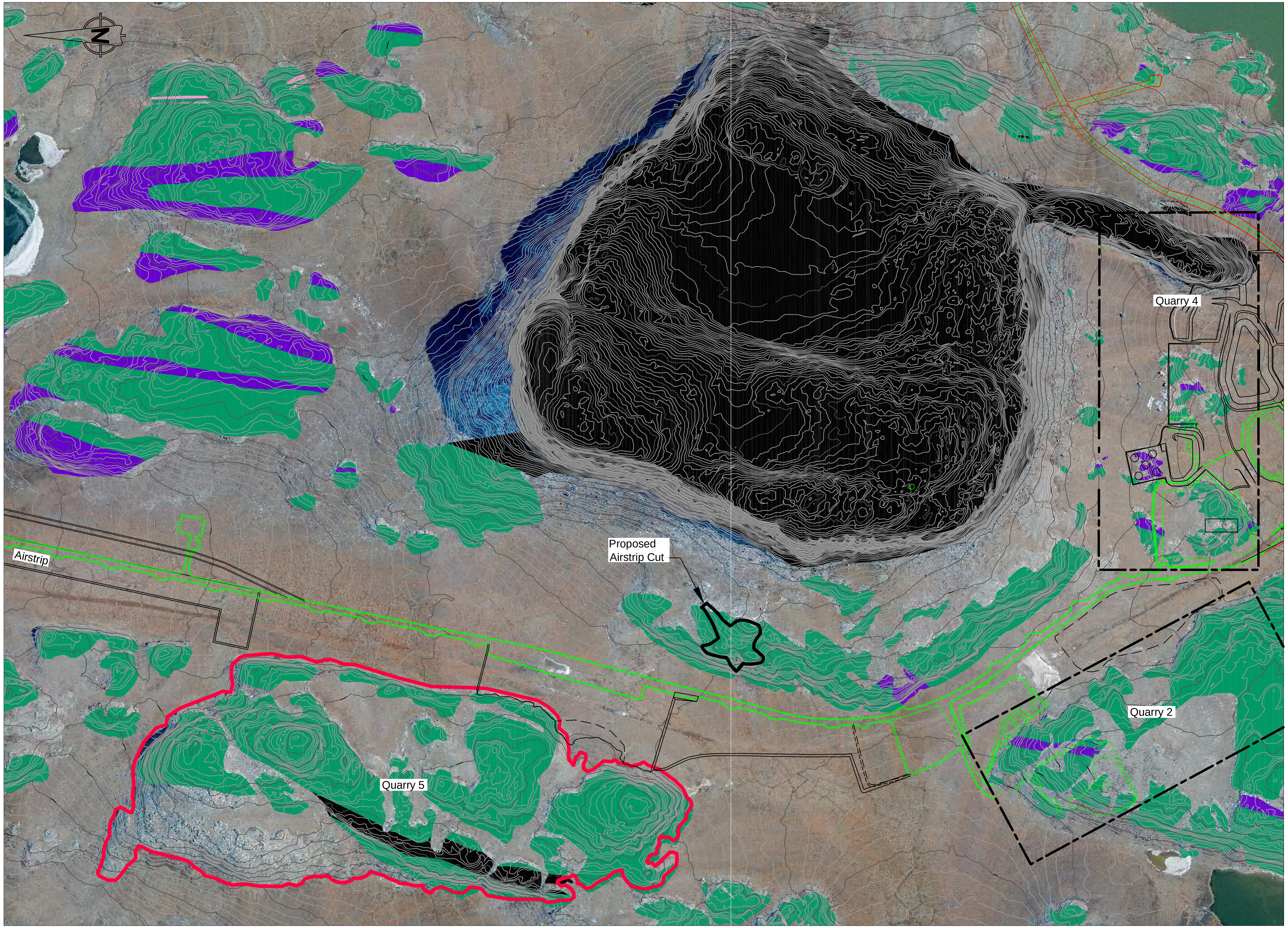
4 References

Transport Canada, 2005. Aerodrome Standards and Recommended Practices. Air Navigation System Requirements Branch. 4th Edition, March 1, 1993, revised March, 2005. Document TP 312E.

SRK 2009. Hope Bay Project Quarry Monitoring. Report prepared for Hope Bay Mining Ltd. by SRK Consulting, November 2009.

SRK 2010a. Geochemical Characterization and Recommendations for Quarry 5, Doris North, Hope Bay Project. Technical Memorandum prepared for Hope Bay Mining Ltd. by SRK Consulting, June 8, 2010.

SRK 2010b. Geochemical Characterization and Recommendations for Doris North Fuel Tank Farm and Mill Pad, Doris North, Hope Bay Project. Technical Memorandum prepared for Hope Bay Mining Ltd. by SRK Consulting, April 23, 2010.



LEGEND

- Ultramafic to Mafic Metavolcanic Rocks (1)
- Early* Mafic and Ultramafic Intrusive Rocks (mainly synvolcanic) (7)
- Proterozoic Rocks (Franklin Diabase) (11)
- Roads and Other Infrastructure Associated with Doris North Project
- As-built infrastructure
- Proposed Rock Quarry
- Quarry Boundary

NOTES:

1. Full more detailed outcrop definitions, see drawing file OutcropR2000_Att-colored.DWG.
2. Mapping is NAD 83, UTM Zone 13.

0 50 100 150 200 250
Scale in Metres

SRK Consulting
Engineers and Scientists
Vancouver B.C.

SRK JOB NO.: 1CH008.029
FILE NAME: Doris Central-Patch Geochem_Quarries.dwg

NEWMONT
NORTH AMERICA

HOPE BAY MINING LTD.

Doris North Phase 1 Infrastructure

Doris North
Airstrip Cut

DATE:	APPROVED:	FIGURE:
Aug. 30, 2010	–	1

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