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Hope Bay Mining Ltd.

2010 Waste Rock and Quarry Monitoring Report

Prepared for:

Hope Bay Mining Ltd.

Prepared by:

SRK Consulting
Engineers and Scientists

Project Reference Number
SRK 1CH008.023

March 2011

Hope Bay Project

2010 Waste Rock and Quarry Monitoring Report

Hope Bay Mining Ltd.

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1 Introduction

Quarry Rock is used for the ongoing construction of infrastructure associated with the Doris North Mine and exploration activities in the area. Monitoring plans are in place to confirm that the potential for Acid Rock Drainage (ARD) and metal leaching from quarry rock used in construction remains very low. The monitoring plans for quarry rock from the Doris Area are detailed in the Monitoring and Follow-Up Plan (Miramar 2007), while monitoring plans for quarries along the Doris Windy Road are detailed in the Hope Bay Project Quarry A, B & D Management and Monitoring Plan – Revision 01 (SRK 2010a).

Specific elements of the quarry monitoring programs include:

- Weekly inspections of the quarry face during quarrying operations;
- A visual inspection of the completed all-weather road;
- A program of check acid base accounting on the quarried rock used in construction, with shake flask extraction tests on a representative subset of samples;
- Seep surveys during the spring freshet along the roadways, airstrip, building pads and quarry sites; and
- Interpretation and reporting of results to the Nunavut Water Board.

This report summarizes the 2010 monitoring results from the quarry monitoring programs.

Underground mining at the site commenced in November 2010. The Monitoring and Follow-Up Plan (Miramar 2007) includes commitments for completing regular seep surveys and routine monitoring of the pollution control ponds beneath the temporary waste rock stockpile. Hope Bay Mining Ltd. (HBML) recently submitted an updated Waste Rock Management Plan for the Doris North project to the Nunavut Water Board (NWB), which includes some changes to the management and monitoring plans, including the addition of a confirmatory monitoring program to assess the effectiveness of the proposed waste rock segregation plan and the suitability of the non-mineralized waste rock for construction (SRK 2010b). The confirmatory monitoring program was initiated in November, and initial results of the underground waste rock monitoring program are therefore included in this report. Routine monitoring of the pollution control ponds will be initiated at the start of spring freshet and the seep survey will be completed immediately following spring freshet. Results from those programs will be provided in the 2011 Waste Rock and Quarry Monitoring report.

2 Monitoring of Quarry Rock Geochemistry

2.1 Quarry 2 Specific Requirements

Specific requirements for the geochemical monitoring program are outlined in Section 7.1 of the 2007 Monitoring and Follow-up Plan, and in Part D, Item 9 of the Doris North Water Licence.

The requirements outlined in the Monitoring and Follow Up Plan are as follows:

> *A program of check ABA (acid base accounting) testing will be conducted on the quarried rock used in site construction to verify that all rock used is non acid generating. A target of collecting 100 samples spread equally over the approximately one million tonnes of rock to be quarried has been established for this follow-up program.*
>
> *During construction samples of quarried rockfill will be collected from the various road and pad construction sites and sent to an accredited external lab for acid base accounting analysis. The following information will be collected for each sample collected:*
>
> - *Location of Sample Point;*
> - *GPS Coordinates of sample point;*
> - *Name of Quarry from which the rockfill came from;*
> - *Date rockfill was placed;*
> - *The Name of the person who performed the sampling;*
> - *Date and time of sampling;*
> - *Date of analysis;*
> - *Name of person who performed the analysis;*
> - *Analytical method or techniques used; and*
> - *Results of analysis.*
>
> *The data will be cross-referenced to a site infrastructure map. The objective is to collect ~100 samples from across the site (spread to capture a representative cross-section of all rockfill used in site construction) to verify that the rock used in construction is non-acid generating.*

Part D "Conditions Applying to Construction" Item 9 of the Doris North water license states:

> *The Licensee shall include, in addition to conducting Quarry Rock Construction Monitoring and Management in accordance with the Water License Application. Monitoring and Follow Up Plan, dated July 2007, the following:*
>
> *a. A subset of twenty (20) samples shall be subjected to Shake Flask Extraction (SFE) tests with an emphasis on near surface rock samples; and*
>
> *b. Submit to the Board for review no later than 6 month after the collection of samples, a report that presents the data collected from the Quarry Rock Construction Monitoring Program. The report shall include a discussion of the interpretation of the geochemical data.*

2.2 Quarries A, B and D Specific Requirements

These commitments are duplicated from the *Hope Bay Project Quarry A, B & D Management and Monitoring Plan – Revision 01* (SRK 2010a).

2.2.1 Visual Inspections

The specific requirements for the visual inspections are as follows:

> *During quarrying operations, a visual inspection of the quarry face to verify the geological characteristics of the rock will be conducted by a qualified field geologist or geochemist at least once per week. The purpose of the inspection will be to confirm the presence of the expected rock types and that disseminated sulphides only (e.g. not veins) are being exposed and therefore used in road construction. A secondary objective of the inspection will be to confirm the absence of any fibrous forms of actinolite in the quarry material.*
>
> *The inspectors will walk from one side of the quarry around to the other side examining both the surface and the exposed bedding material along the side of the quarry for any anomalous rock types (i.e. other than Mg-tholeitic basalt) or significant amounts of sulphide. If present, these materials will be examined, described, and located on a map. In addition, at regular 100 metre intervals, the inspector will stop and complete a close inspection of the rocks, breaking open several rock clasts and describing what they see. The results of each inspection will be recorded on data sheets, and reported in the Construction Monitoring Report submitted by March 31 of the year following construction (i.e. within six month of the collection of samples as prescribed in the License).*

2.2.2 Quarry Rock Sampling

The specific requirements for the geochemical monitoring program are as follows:

> *During quarrying activities, 2 samples of blast material from each quarry will be collected and submitted to an accredited external lab for sulphur analysis. In the event that the results return a sulphur value of greater than (>) 0.1 % sulphur, the samples will be subjected to acid-base accounting (ABA) and other confirmatory test work including shake flask extraction tests on a representative subset of samples. Each sample will consist of a whole rock sample and a sample sieved to pass a -2 mm screen for a potential total of 12 ABA analyses. The sample locations will be pre-determined to ensure that they reflect a random selection of the rock fill material used in road construction.*
>
> *The objective of this program will be to confirm previous rock characterization results and to assess the ARD potential of the fine fraction, which tends to concentrate sulphide minerals.*

The information to be recorded for each sample collected is the same as that listed for Quarry 2 above.

> *The results of the analysis will be reported in a Construction Monitoring Report submitted by March31 of the year following construction (i.e. within six months of the collection of samples as prescribed in the License). The report will include a discussion and interpretation of the geochemical data collected.*

2.2.3 Road Material Sampling

These commitments are duplicated from the *Hope Bay Project Quarry A, B & D Management and Monitoring Plan – Revision 01* (SRK 2010a):

> *Once the all-weather road construction is complete, an inspection of the entire road length will be conducted by a qualified field geologist or geochemist to characterize the rock used in construction. That inspection will include the collection of a total of 19 samples of in situ rock fill from pre-determined points along the road route (approximately 1 sample per 0.5 kilometres of road). Each sample will consist of a whole and a sample sieved to pass a -2 mm screen. The sample locations will be pre-determined to ensure that they reflect a random selection of a representative sample of the in situ rock fill from each quarry used to construct the road.*
>
> *All of the samples will be submitted to an accredited external lab for sulphur analysis. In the event that the results return a sulphur value of greater than (>) 0.1 % sulphur, the samples will be subject to acid-base accounting (ABA) and shake flask extraction tests on a representative subset of samples. Testing will be completed on both the fines and the whole sample, for a total of 28 analyses.*
>
> *The objective of this program is to confirm previous rock characterization results and assess the ARD potential of the fine fraction, which tends to concentrate sulphide minerals.*
>
> *The following information will be recorded for each sample collected:*
>
> - *Description of the sample point;*
> - *GPS Coordinates of sample point;*
> - *An estimate of which quarry the rock fill originated from;*
> - *The name of the person who performed the sampling;*
> - *Date and time of sampling;*
> - *Date of analysis;*
> - *Name of person who performed the analysis;*
> - *Analytical method or techniques used; and*
> - *Results of analysis.*
>
> *The results will be reported in an Addendum to the original Construction Monitoring Report. The Addendum will include a discussion and interpretation of the geochemical data collected.*

2.3 Sampling and Testing Program

Detailed methods and results from the 2010 sampling and testing program are presented in a memo by SRK, as provided in Appendix A.

A total of 84 rock samples were collected, including:

- 40 samples from Quarries A, B, D, and 2;
- 34 samples from the Doris-Windy all-weather road; and
- 10 samples from the rock pads that were constructed in 2010.

All of the samples were submitted to Maxxam Laboratories for total sulphur and carbon by Leco furnace and elemental analysis by ICP-MS following aqua-regia digestion. Samples with greater than 0.1% total sulphur were submitted for complete acid base accounting tests, including total inorganic carbon and sulphur speciation, and neutralization potential (NP) determination using the modified Sobek method.

2.4 Results

2.4.1 Acid Base Accounting Results

Results of the 2010 acid-base accounting tests are presented and discussed in a technical memo, as provided in Appendix A. A brief summary is provided as follows.

The results of the sulphur analyses are summarized in Table 1. The results indicate that all of the samples had low sulphur concentrations, and that most had concentrations of less than 0.2% (equivalent to an acid potential or AP of 6.3 kg $CaCO_3$ eq/tonne). Samples with sulphur concentrations above 0.1% were submitted for full acid-base accounting tests.

Table 1: Distribution of Samples by Sulphur Content

Total Sulphur %	Number of Samples (Quarry)	Number of Samples (Doris-Windy Road)	Number of Samples (Pad)
<0.1%	18	10	8
0.1 to 0.2%	16	10	2
0.2 to 0.3%	4	8	
>0.3%	2	6	

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Acid-base accounting results showed that all samples contained substantial amounts of neutralization potential, and that most of the neutralization potential was present as with carbonates. Conventional NP/AP ratios were all greater than 3 (Figure 1), indicating these samples are not potentially acid generating.

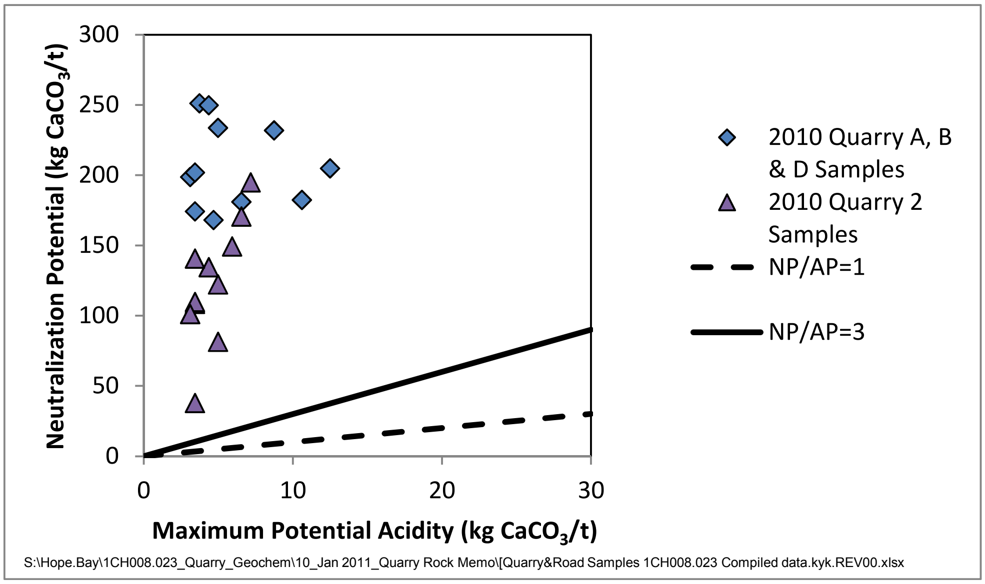

Figure 1: Neutralization Potential versus Acid Potential for 2010 Quarry Samples with >0.1 wt. % Total Sulphur.

2.4.2 Elemental Analysis

Results of the 2010 elemental analysis are provided in Appendix A. Elemental analyses indicate that concentrations of most parameters are within 10 times the average crustal abundance for basaltic rocks. These findings are consistent with the results of testing completed in support of the permit applications for the Doris Mine Area and for the Doris-Windy Road.

2.4.3 Shake Flask Extraction Test Results

Shake flask extraction tests were not conducted due to a communications error with the laboratory which resulted in all of the material being pulverized, and therefore, not suitable for testing. The requirement to complete shake flask tests will need to be addressed in 2011.

3 Monitoring of Waste Rock Geochemistry

3.1 Specific Requirements

HBML recently submitted an updated Waste Rock Management Plan for the Doris North project to the Nunavut Water Board (NWB). *Hope Bay Project Doris North Waste Rock and Ore Management Plan* (SRK 2010b). The plan includes detailed recommendations for segregating the waste rock according to its potential for metal leaching and/or acid rock drainage (ML/ARD), and confirmatory monitoring to establish whether the non-mineralized rock could be used for construction.

3.2 Sampling and Testing Program

Underground mining commenced in November 2010, and the monitoring program was implemented upon start of mining. Detailed methods and results are presented in a memo by SRK, as provided in Appendix B.

A total of 10 rock samples were collected between November 2010 and March 10, 2011.

Samples for sulphur, total inorganic carbon (TIC) and acid-base accounting (ABA) tests were shipped to ALS Laboratories in Yellowknife for preparation. Splits were sent to ALS for sulphur and TIC analyses at ALS Laboratories in Vancouver, and to Maxxam Laboratories for ABA tests. The samples for shake flask extraction tests were shipped directly to Maxaam for testing.

3.3 Results

The mining to date has been primarily through diabase, which is a relatively uniform type of rock from a geochemical perspective.

The results to date indicate that the underground waste rock is non-acid generating and meets the definitions of non-mineralized waste rock for management purposes. Further regulatory approvals are needed before any of the rock could be designated as suitable for construction.

4 Seepage Surveys

4.1 Specific Requirements

Specific requirements for the seepage surveys in the Doris North area are outlined in the Monitoring and Follow-Up Plan and in Part D, Item 9 of the Doris North Water Licence. The requirements for the Doris-Windy Road are outlined in Section 5.2 of the *Hope Bay Project Quarry A, B & D Management and Monitoring Plan – Revision 01* (SRK 2010a), and are summarized below.

The requirements outlined in the Monitoring and Follow-Up Plan (Miramar 2007) are as follows:

> *During the spring freshet in the year following completion of the construction of the Doris Windy all-weather road, an inspection of the entire road will be conducted by a qualified field geologist or geochemist in order to characterize the rock used in construction and to identify and sample ephemeral seeps occurring through the road construction material. The objective of this program will be to confirm that an environmentally significant level of metal leaching is not occurring from the road materials.*
>
> *Seeps will be located by walking along the downstream side of the road and looking and listening for signs of flowing water. In low lying areas where the direction of surface water flow is not evident, both sides of the structure will be inspected. Where surface flows are identified, the upstream side will be inspected to determine whether the flow originates from the upstream side or whether it is likely to originate from within the rock fill material. Most samples will target the latter, more ideal type of seep. However, a modest number (maximum of one location every two km of road) will be collected at locations where there is moderate upstream flow component. In these cases, samples will be collected from both upstream and downstream of the road.*
>
> *A survey stake will be installed to mark the location of each seep sampled and the following information recorded:*
>
> - *Description of the seep location;*
> - *GPS location of the seep;*
> - *A photographic record of the seep;*
> - *A description of the flow pattern and magnitude of flow;*
> - *Field pH, EC, Eh and temperature readings; and,*
> - *Field pH, EC, Eh and temperature measurements at a reference site located away from the influence of the road or other mine related activities.*

At a minimum, a water sample will be collected from 10% of the identified ephemeral seeps (regardless of the field measurement values) appropriately preserved and submitted for laboratory analysis. The following information will be recorded;

- *The name of the person who performed the sampling;*
- *Date and time of sampling;*
- *Date of analysis;*
- *Name of person who performed the analysis;*
- *Analytical method or techniques used; and*
- *Results of analysis.*

All of the samples collected will be preserved in an appropriate manner, labelled and submitted to an accredited laboratory for analysis of pH, TDS, acidity and/or alkalinity, sulphate, total ammonia, nitrate, and a full suite of metals by ICP-MS.

A second follow-up seep survey will be completed immediately before freeze up the same year (depending on conditions observed) or during the spring freshet the following year. The follow-up survey will revisit the sites identified during the initial seep survey and repeat the actions of the initial survey.

The results of the seep survey will be reported in a flow up Addendum to the Construction Monitoring Report submitted by March 31 of the year following construction (i.e. within six months of the collection of samples as prescribed in the License). The Addendum will include a discussion of the interpretation of the geochemical data collected.

Part D “Conditions Applying to Construction” Item 21 of the Doris North water license states:

The Licensee shall conduct a Quarry Rock Seepage Monitoring and Management program in accordance with the Water Licence Application Monitoring and Follow-Up Plan, dated July 2007 and in accordance with the following:

a. The seep survey shall measure pH and Electrical Conductivity (EC) levels in the precipitation runoff and snowmelt that comes into contact with rock along the roadways, building pads and quarry sites;

b. The seep survey shall measure pH and EC levels at several reference points on the tundra not subject to mine influences;

c. The quarry rock seepage program shall be conducted on any ephemeral seepage present at the time of the quarry rock seepage monitoring program and not at pre-determined seepage stations;

d. A minimum of at least 10% of the total sample set shall be submitted for secondary analysis, regardless of the values of measured field pH and EC; and

e. The Quarry Rock Seepage Monitoring Program shall be expanded beyond the 100 samples to include monitoring of all rock drains.

4.2 Sampling and Testing Program

The 2010 seep survey (Appendix C) was carried out during the last week of June 2010. Seep survey locations were established by walking the toes of all roadways, building pads and quarry sites. A total of 103 sites, including 3 reference sites, were established and field pH and electrical conductivity readings were taken. Samples were collected from all six sites with pHs exceeding 8, fifteen of the more typical sites with pHs between 7 and 8, and all three reference sites. Samples were submitted to ALS-Chemex, Vancouver, BC for analysis of nutrients (ammonia and nitrate) routine parameters (pH, alkalinity and sulphate) and a full suite of dissolved metals by ICP-MS.

4.3 Results

Results of the 2010 seep survey are presented in Appendix C, and are summarized below.

The results of the seep field measurements are summarized in Table 2. The majority of seepage sites had field pH measurements between 7 to 8 and field conductivity readings less than 500 µS/cm. None of the seeps were acidic. The range of pHs were similar to that of reference point locations, while conductivities were generally higher at the seepage stations that were associated with quarry rock.

Table 2: Distribution of Samples according to Field pH and Conductivity (EC)

	Number of Samples		
	pH 6.5 to 7	pH 7 to 8	pH 8 to 8.5
EC > 500 µS/cm	3	41	1
EC ≤ 500 µS/cm	6	44	8

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The results of the 2010 seep survey indicated that:

- Samples with the highest pH were generally in the vicinity of Doris Camp;
- The electrical conductivity of seepage waters was generally higher in 2010 than in 2009;
- There were no major differences in major ion, nutrient or metal concentrations between samples grouped according to pH;
- Nitrate was higher than CCME guidelines for freshwater aquatic life in 3 of the 21 seeps submitted for laboratory analysis; and
- Copper concentrations were greater than CCME guidelines for 17 of the 21 seeps.

Overall, the results were consistent with 2009 results (SRK 2009).

5 Summary and Conclusions

The results of the acid base accounting tests indicated that all of the quarry samples were non-acid generating. These results are consistent with characterization programs completed prior to permitting and development. Elemental analysis of 2009 samples indicated that quarry rock is not enriched in metals compared to average crustal abundances for basaltic rock.

The results of the underground waste rock monitoring indicated that segregation programs have been effective in identifying mineralized waste. Further assessment will be needed once the decline advances into other more variable types of rock.

The results of the seepage surveys indicated near neutral pH conditions in all of the seeps and ponded water samples associated with the quarry rock. Nitrate and ammonia levels were slightly elevated in two seeps located in Quarries 1 and 2. Metal concentrations were generally low and, with the exception of copper, below CCME guidelines for freshwater aquatic life. Copper concentrations were marginally above guidelines in several of the samples.

"This report and the opinions and conclusions contained herein ("Report") contains the expression of the professional opinion of SRK Consulting (Canada) Inc. ("SRK") as to the matters set out herein, subject to the terms and conditions of the agreement dated September 30, 2008 (the "Agreement") between Consultant and Hope Bay Mining Ltd. ("Hope Bay Mining"), the methodology, procedures and sampling techniques used, SRK's assumptions, and the circumstances and constraints under which Services under the Agreement were performed by SRK. This Report is written solely for the purpose stated in the Agreement, and for the sole and exclusive benefit of Hope Bay Mining, whose remedies are limited to those set out in the Agreement. This Report is meant to be read as a whole, and sections or parts thereof should thus not be read or relied upon out of context. In addition, this report is based in part on information not within the control of SRK. Accordingly, use of such report shall be at the user's sole risk. Such use by users other than Hope Bay Mining and its corporate affiliates shall constitute a release and agreement to defend and indemnify SRK from and against any liability (including but not limited to liability for special, indirect or consequential damages) in connection with such use. Such release from and indemnification against liability shall apply in contract, tort (including negligence of SRK whether active, passive, joint or concurrent), strict liability, or other theory of legal liability; provided, however, such release, limitation and indemnity provisions shall be effective to, and only to, the maximum extent, scope or amount allowable by law."

This report, "**1CH008.023– Quarry Rock Seepage Monitoring, Hope Bay Project**," was prepared by SRK Consulting (Canada) Inc.

Prepared by

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Consultant - Geochemistry

Reviewed by

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Principal Environmental Geochemist

6 References

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Appendix A
2010 Quarry Rock Sampling Program

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Memo

To:	File	**Date:**	March 28, 2011
cc:		**From:**	Kirsty Ketchum Lisa Barazzuol Kelly Sexsmith
Subject:	2010 Quarry Rock Sampling	**Project #:**	1CH008.023

1 Introduction

During 2010, quarry rock was excavated from three quarries and used in the construction of the Doris-Windy all-weather road (Quarries A, B and D), and two quarries used for the construction of various other infrastructure associated with development of the Doris Mine (Quarries 2 and 4). Prior to development, the rock from each of these quarries was characterized geochemically (SRK, 2008) and classified as not potentially acid generating with low potential for metal leaching. To confirm these results and to assess the ARD potential of the fine fraction, further characterization and monitoring was necessary during quarrying activities and post-construction. Monitoring commitments that address the requirements for Quarries associated with the Doris Mine, as specified in Water Licence 2AM-DOH0713 and KIA Permit KTP307Q010 are documented in the *Monitoring and Follow-up Plan* for the site (MHBL, 2007). The *Hope Bay Project Quarry A, B & D Management and Monitoring Plan – Revision 01* (SRK, 2010) describes the commitments for monitoring the quarries used in development of the Doris-Windy all-weather road as required in Water Licence 2BE-HOP0712 – Amendment No. 4 and the KIA Quarry Permit Agreement KTP308Q010. To ensure consistent procedures are followed in all areas of the site, the monitoring procedures in the A, B & D Management and Monitoring Plan also addresses the monitoring requirements in Water Licence 2AM-DOH0713 and Quarry Permit Agreement KTP307Q010.

2 Monitoring Requirements

2.1 Quarry 2

Specific requirements for the geochemical monitoring program are outlined in Section 7.1 of the 2007 Monitoring and Follow-Up Plan, and in Part D, Item 9 of the Doris North Water Licence. The requirements outlined in the Monitoring and Follow-Up Plan are as follows:

> *A program of check ABA (acid base accounting) testing will be conducted on the quarried rock used in site construction to verify that all rock used is non-acid generating. A target of collecting 100 samples spread equally over the approximately one million tonnes of rock to be quarried has been established for this follow-up program.*
>
> *During construction samples of quarried rockfill will be collected from the various road and pad construction sites and sent to an accredited external lab for acid base accounting analysis. The following information will be collected for each sample collected:*
> - *Location of Sample Point;*
> - *GPS Coordinates of sample point;*
> - *Name of Quarry from which the rockfill came from;*

- *Date rockfill was placed;*
- *The Name of the person who performed the sampling;*
- *Date and time of sampling;*
- *Date of analysis;*
- *Name of person who performed the analysis;*
- *Analytical method or techniques used; and*
- *Results of analysis.*

The data will be cross-referenced to a site infrastructure map. The objective is to collect ~100 samples from across the site (spread to capture a representative cross-section of all rockfill used in site construction) to verify that the rock used in construction is non-acid generating.

Part D "Conditions Applying to Construction" Item 9 of the Doris North water license states:

The Licensee shall include, in addition to conducting Quarry Rock Construction Monitoring and Management in accordance with the Water License Application. Monitoring and Follow Up Plan, dated July 2007, the following:

a. A subset of twenty (20) samples shall be subjected to Shake Flask Extraction (SFE) tests with an emphasis on near surface rock samples; and

b. Submit to the Board for review no later than 6 month after the collection of samples, a report that presents the data collected from the Quarry Rock Construction Monitoring Program. The report shall include a discussion of the interpretation of the geochemical data.

2.2 Quarries A, B and D

These commitments are duplicated from The *Hope Bay Project Quarry A, B & D Management and Monitoring Plan – Revision 01* (SRK, 2010).

2.2.1 Visual Inspections

During quarrying operations, a visual inspection of the quarry face to verify the geological characteristics of the rock will be conducted by a qualified field geologist or geochemist at least once per week. The purpose of the inspection will be to confirm the presence of the expected rock types and that disseminated sulphides only (e.g. not veins) are being exposed and therefore used in road construction. A secondary objective of the inspection will be to confirm the absence of any fibrous forms of actinolite in the quarry material.

The inspectors will walk from one side of the quarry around to the other side examining both the surface and the exposed bedding material along the side of the quarry for any anomalous rock types (i.e. other than Mg-tholeitic basalt) or significant amounts of sulphide. If present, these materials will be examined, described, and located on a map. In addition, at regular 100 metre intervals, the inspector will stop and complete a close inspection of the rocks, breaking open several rock clasts and describing what they see. The results of each inspection will be recorded on data sheets, and reported in the Construction Monitoring Report submitted by March 31 of the year following construction (i.e. within six month of the collection of samples as prescribed in the License).

2.2.2 Quarry Rock Sampling

The specific requirements for the geochemical monitoring program are as follows:

During quarrying activities, 2 samples of blast material from each quarry will be collected and submitted to an accredited external lab for sulphur analysis. In the event that the results return a sulphur value of greater than (>) 0.1 % sulphur, the samples will be subjected to *acid-base accounting (ABA) and other confirmatory test work including shake flask extraction tests on a representative subset of samples. Each sample will consist of a whole rock sample and a sample sieved to pass a -2 mm screen for a potential total of 12 ABA analyses. The sample locations will be pre-determined to ensure that they reflect a random selection of the rock fill material used in road construction.*

The objective of this program will be to confirm previous rock characterization results and to assess the ARD potential of the fine fraction, which tends to concentrate sulphide minerals.

The information to be recorded for each sample collected is the same as that listed for Quarry 2 above.

The results of the analysis will be reported in a Construction Monitoring Report submitted by March 31 of the year following construction (i.e. within six months of the collection of samples as prescribed in the License). The report will include a discussion and interpretation of the geochemical data collected.

2.3 Road Material Sampling

These commitments are duplicated from The *Hope Bay Project Quarry A, B & D Management and Monitoring Plan – Revision 01* (SRK, 2010).

Once the all-weather road construction is complete, an inspection of the entire road length will be conducted by a qualified field geologist or geochemist to characterize the rock used in construction. That inspection will include the collection of a total of 19 samples of in situ rock fill from pre-determined points along the road route (approximately 1 sample per 0.5 kilometres of road). Each sample will consist of a whole and a sample sieved to pass a -2 mm screen. The sample locations will be pre-determined to ensure that they reflect a random selection of a representative sample of the in situ rock fill from each quarry used to construct the road.

All of the samples will be submitted to an accredited external lab for sulphur analysis. In the event that the results return a sulphur value of greater than (>) 0.1 % sulphur, the samples will be subject to acid-base accounting (ABA) and shake flask extraction tests on a representative subset of samples. Testing will be completed on both the fines and the whole sample, for a total of 28 analyses.

The objective of this program is to confirm previous rock characterization results and assess the ARD potential of the fine fraction, which tends to concentrate sulphide minerals.

The following information will be recorded for each sample collected:

- *Description of the sample point;*
- *GPS Coordinates of sample point;*
- *An estimate of which quarry the rock fill originated from;*
- *The name of the person who performed the sampling;*
- *Date and time of sampling;*
- *Date of analysis;*
- *Name of person who performed the analysis;*
- *Analytical method or techniques used; and*
- *Results of analysis.*

The results will be reported in an Addendum to the original Construction Monitoring Report. The Addendum will include a discussion and interpretation of the geochemical data collected.

3 Methods

3.1 Quarry Inspection, Sampling and Analysis

During the 2010 construction season, quarrying operations were active in Quarries A, B, D and Quarry 2. Freshly exposed rock in active quarry faces was visually inspected and sampled by qualified site geologists. Field notes were taken to document the lithology, sulphide content and veining. Rock samples were collected from active quarry faces, freshly blasted rock or drill cuttings during each inspection. Most samples were sieved and separate <1cm and <2mm fractions were collected. A total of 42 samples were obtained, including 21 from Quarries A, B and D, and 21 from Quarry 2. Sample descriptions and locations are provided in Attachment 1 and sample locations are shown on Drawings 1 to 4.

Forty two samples were submitted to Maxxam Laboratories for total sulphur and total carbon by Leco and elemental analysis by ICP-MS following aqua regia digestion. Based on the criteria of >0.1 wt. % total sulphur, twenty two of these samples were submitted for further acid-base accounting (ABA). ABA tests were conducted using the Modified Sobek method with sulphur speciation and TIC analysis.

Shake flask extraction tests were not conducted due to a communications error with the laboratory which resulted in all of the material being pulverized, and therefore, not suitable for testing. The requirement to complete shake flask tests will need to be addressed in 2011.

3.2 Doris-Windy All-Weather Road Inspection, Sampling and Analysis

The road was visually inspected by walking along the base on the western side. Samples were collected from a total of 23 sites on September 29 (sites 1 to 9 and 20) and October 1, 2010 (sites 10 to 19 and 21 to 23). The locations of sites 1 to 19 were pre-determined, as per license requirements and were selected to be at approximately equidistant intervals along the length of the constructed road. Samples were collected from an additional four sites during the field inspection. The rationale for the extra sampling included collection of the fine fraction (site 20), which was not observed at most of the sites on September 29, and also additional sampling of material from Quarry A, B and D (sites 21 to 23) as it was learned during the inspection that the materials from sites 17 to 19 were sourced from Quarry 2.

At each sampling site, a composite of approximately 2 kg of run-of-quarry material was sampled from the base of the west side of the road The surface of the road was not sampled as the objective was to obtain samples of Quarry A, B and D material and the surface crush was sourced from Quarry 2. When available, approximately 1 kg of the fine fraction (<2 mm) was obtained by manual sieving. One exception to this sampling methodology was at site 20, where only the fine fraction was obtained. Sample locations are shown in Drawing 5 and sample descriptions and locations are provided in Attachment 2.

Thirty four samples were submitted to Maxxam Laboratories for total sulphur analysis by Leco. Based on the criteria of >0.1 wt. % total sulphur, 24 of these samples were submitted for further acid-base accounting (ABA) and elemental analysis. ABA tests were conducted using the Modified Sobek method with sulphur speciation and TIC analysis. Metal concentrations were determined using aqua regia digestion followed by ICP-MS analysis.

Shake flask extraction tests were not conducted due to a communications error with the laboratory which resulted in all of the material being pulverized, and therefore, not suitable for testing. The requirement to complete shake flask tests will need to be addressed in 2011.

3.3 Other Infrastructure Sampling and Analysis

During the 2010 construction season, two additional rock pads were constructed (Pad R and Pad D) within the Camp footprint. Quarry 2 material was used for this new infrastructure. These areas were inspected and sampled by the site geologists following the protocols established for the roads. Field notes were taken to document the lithology, sulphide content and veining of the material used. Rock samples were collected from surface material or drill cuttings with a total of 10 samples obtained. Sample descriptions and locations are provided in Attachment 3 and sample locations are shown on Drawing 4.

Ten samples were submitted to Maxxam Laboratories for total sulphur and total carbon analysis by Leco and elemental analysis by ICP-MS following aqua regia digestion. Based on the criteria of >0.1 wt. % total sulphur, two of these samples were submitted for further ABA analysis. ABA tests were conducted using the Modified Sobek method with sulphur speciation and TIC analysis.

4 Results

4.1 Quarry Monitoring

4.1.1 Visual Observations

Visual observations are provided in Attachment 1. The majority of the rock inspected in the quarries was observed to be grey/green fine grained basalt with trace to 1% disseminated sulphides. Significant calcite veining was present at some locations. In parts of Quarry B, pyrite occurred as abundant euhedral cubes across fracture surfaces in basalt.

4.1.2 ABA

Total sulphur, total carbon and elemental analyses for all 42 quarry rock samples are provided in Attachment 4. The total sulphur and total carbon analyses are summarized in Table 1. The total sulphur was used to calculate the acid potential (AP), and the total carbon (which is equivalent to inorganic carbon in these samples) was used to calculated the total inorganic carbon in units of neutralization potential. These in turn were used to calculate TIC/AP ratios for the full set of samples. Based purely on total sulphur and total carbon data, TIC significantly exceeds acid potential in all of the samples, indicating that they are not potentially acid generating.

Table 1: Summary of Total Sulphur and Carbon Results for 42 Quarry Samples

Statistic (n=42)	Total Sulphur Wt. %	Total Carbon Wt. %	AP* kg $CaCO_3$/t	TIC** kg $CaCO_3$/t	TIC/AP
25th percentile	0.06	1.1	2.0	94	28
Median	0.11	1.5	3.3	126	34
75th Percentile	0.16	2.2	4.9	183	57
Maximum	0.41	3.1	13	259	159

Notes: * AP=Acid Potential based on total sulphur
**TIC = Total inorganic carbon in units of NP, based on total carbon analyses
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Of these 42 samples, 24 samples contained >0.1 wt. % total S and were submitted for full ABA testing. The ABA results are provided in Attachment 5 and summarized in Table 2. Consistent with the presence of high total carbon, most of these samples contained substantial amounts of neutralization potential (NP). Samples from Quarries A, B and D tended to contain more NP than samples from Quarry 2. However, the NP/AP ratios for all the samples subjected to full ABA testing were significantly greater than 3 (Figure 1), indicating that they are not potentially acid generating. Neutralization potential was well correlated with carbonate content (TIC) indicating that carbonates are the likely source of the neutralization potential (Figure 2).

Table 2: Summary of Acid Base Accounting Results for 22 Quarry Samples with >0.1 wt. % Total Sulphur

Statistic (n=22)	Paste pH	Total Sulphur	Sulphate Sulphur	MPA	Modified NP	TIC	NP/AP
		Wt. %	Wt. %	kg $CaCO_3$/t	kg $CaCO_3$/t	kg $CaCO_3$/t	
25th percentile	8.6	0.11	0.01	3.4	125	120	25
Median	8.8	0.16	0.01	4.5	172	173	31
75th Percentile	9.0	0.21	0.01	6.4	201	204	45
Maximum	9.5	0.41	0.01	12	251	266	67

Notes: MPA=Maximum Potential Acidity based on sulphide sulphur; NP = Neutralization Potential; TIC = Total inorganic carbon; AP = Acid Potential.
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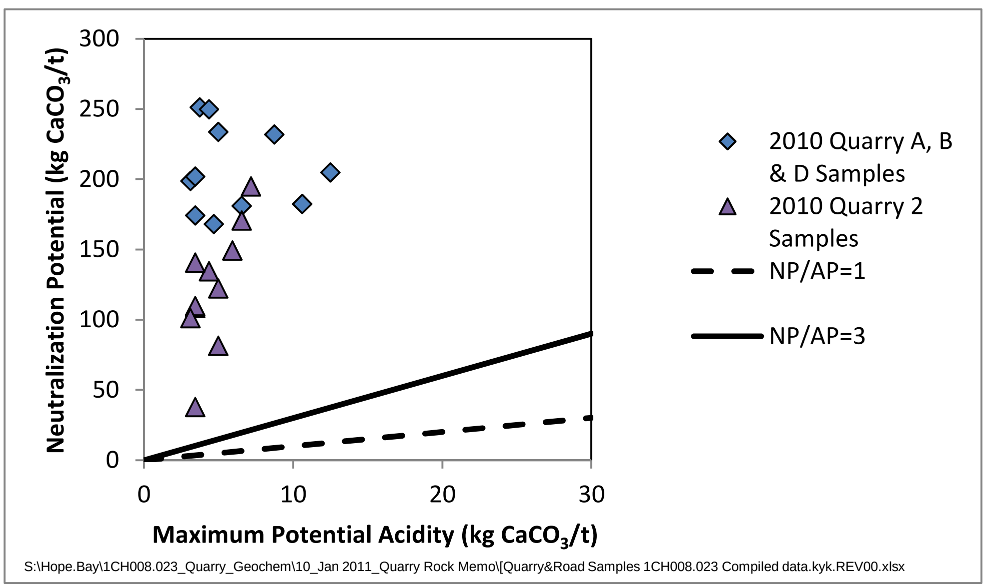

Figure 1: Neutralization Potential versus Acid Potential for 2010 Quarry Samples with >0.1 wt. % Total Sulphur.

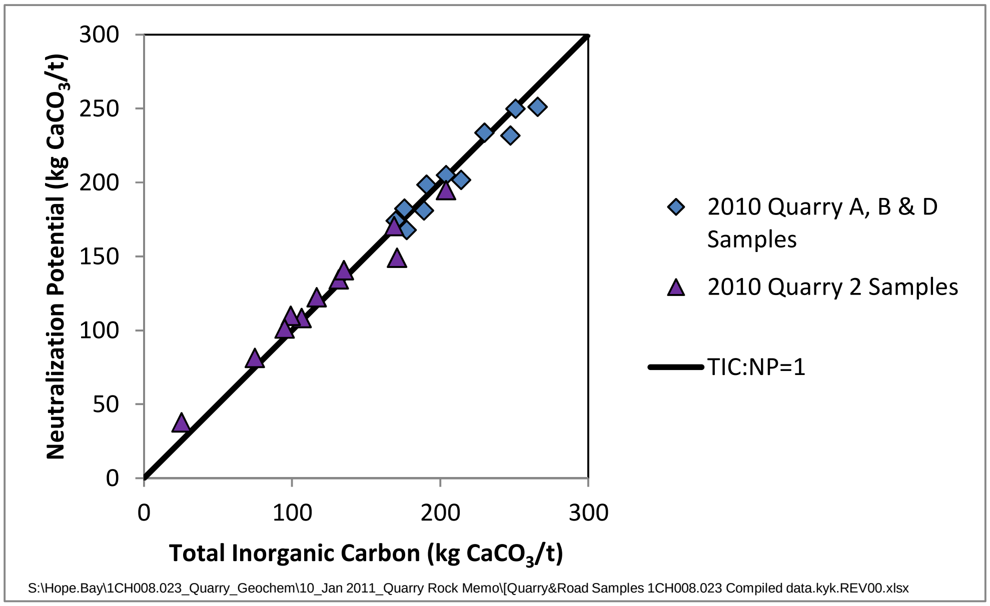

Figure 2: Neutralization Potential versus Total Inorganic Carbon for 2010 Quarry Samples with >0.1 wt. % Total Sulphur.

4.1.3 Elemental Analyses

Results of the elemental analyses for all 42 quarry samples are provided in Attachment 4 and are summarized in Table 3. The data are compared to ten times the average crustal abundance for basaltic rocks (Price, 1997) to screen for parameters that are elevated in the rocks. Most parameters do not exceed these screening criteria. One sample exceeds the average basaltic crustal abundance of gold, having the maximum gold content for these samples of 45 ppb. This is to be expected near a gold deposit and is environmentally insignificant. Nineteen samples exceed the average basaltic crustal abundance of selenium, with concentrations of up to 1.3 ppm. However these values were all close to the detection limit of 0.5 ppm, and the data are considered to be within the range of analytical uncertainty.

Table 3: Summary of Elemental Analyses for 42 Quarry Samples

Parameter	Units	P25	Median	P75	Max	Average Crustal Abundance for Basaltic Rocks
Ag	ppm	<0.1	<0.1	<0.1	0.2	0.1
As	ppm	1.3	1.9	3.9	17	2
Au	ppb	1.2	2.0	3.1	**45**	4
Ba	ppm	3.0	5.0	11	154	330
Ca	%	4.0	5.2	7.2	10	7.6
Cd	ppm	0.15	0.20	0.30	1.2	0.2
Co	ppm	37	40	43	84	48
Cr	ppm	128	157	347	1398	170
Cu	ppm	106	134	150	239	87
Fe	%	5.1	5.6	6.9	10	8.7
Hg	ppm	<0.01	<0.01	<0.01	<0.01	0.00009
Mg	%	2.2	2.8	3.2	6.7	4.6
Mn	ppm	1164	1272	1496	1967	1500
Mo	ppm	0.20	0.20	0.50	4.1	1.5
Ni	ppm	59	62	127	762	130
P	%	0.023	0.026	0.040	0.058	0.11
Pb	ppm	0.60	1.7	4.8	23	6
Sb	ppm	<0.1	<0.1	<0.1	0.3	0.2
Se	ppm	<0.5	<0.5	**0.6**	**1.3**	0.05
Sr	ppm	17	22	29	177	465
Ti	%	0.21	0.28	0.34	0.44	1.4
U	ppm	<0.1	<0.1	<0.1	0.1	1
V	ppm	118	137	172	319	250
W	ppm	0.10	0.20	0.33	0.40	0.7
Zn	ppm	68	81	99	192	105

Note: Numbers highlighted in bold exceed 10 times the average crustal abundance for basaltic rocks Price (1997).

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4.2 Doris-Windy All-Weather Road Monitoring

4.2.1 Visual Observations

Samples along the entire length of the road were characterised as mafic metavolcanics. Sulphides were predominantly not present or present at <1% abundance and finely disseminated. One sample had a greater abundance of sulphides occurring as bands of fine grained euhedral pyrite at 3 to 5 % abundance. Full visual observations are recorded in Attachment 2.

4.2.2 ABA

Acid base accounting results for 24 samples (and total sulphur for 34 samples) collected from the Doris-Windy All-Weather road are provided in Attachment 6 and summarized in Table 4.

Table 4: Summary of Acid Base Accounting Results for 24 Samples from the Doris-Windy All-Weather Road.

Statistic (n=24)	Paste pH	Total Sulphur* Wt. %	Sulphate Sulphur Wt. %	MPA kg $CaCO_3$/t	Modified NP kg $CaCO_3$/t	TIC kg $CaCO_3$/t	NP/AP
25th percentile	8.7	0.09	0.01	4.9	122	129	15
Median	9.0	0.16	0.01	6.7	155	162	24
75th Percentile	9.1	0.26	0.01	9.3	216	220	30
Maximum	9.6	1.6	0.01	51	325	365	57

Notes: *n=34 for total sulphur
MPA=Maximum Potential Acidity based on sulphide sulphur; NP = Neutralization Potential; TIC = Total inorganic carbon; AP = Acid Potential.
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The ABA results show that the road samples all contain substantial amounts of neutralization potential with NP/AP ratios significantly greater than 3 (Figure 3), indicating that the samples are not potentially acid generating. Neutralization potential is well correlated with carbonate content (TIC) indicating that carbonates are the likely source of the neutralization potential (Figure 4).

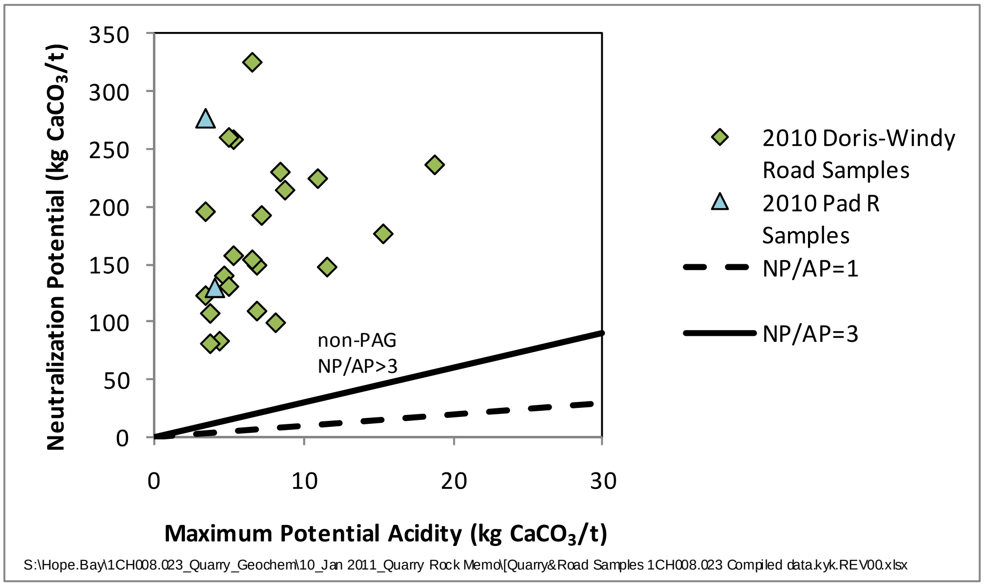

Figure 3: Neutralization Potential versus Acid Potential for 2010 Infrastructure samples with >0.1 wt. % Total Sulphur.

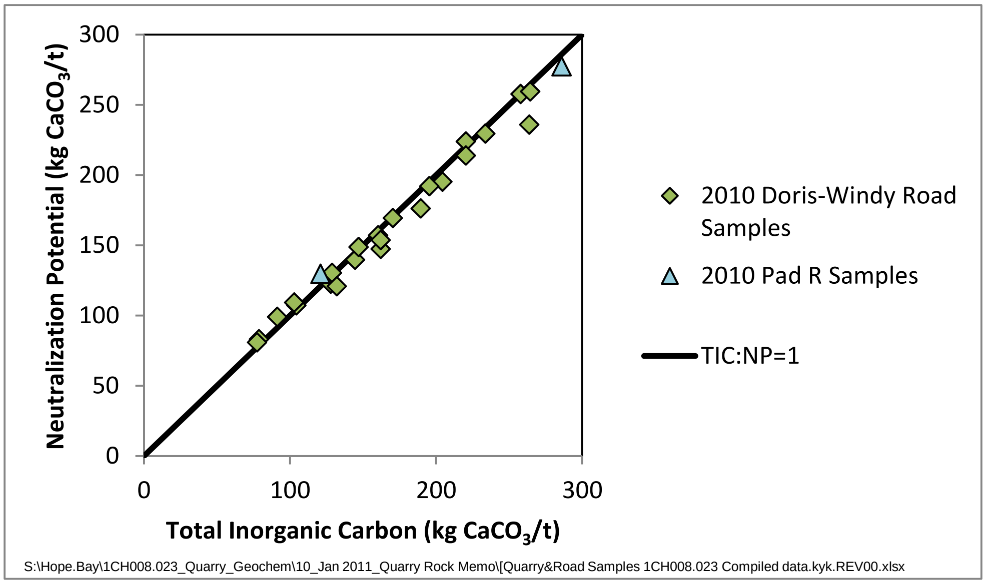

Figure 4: Neutralization Potential versus Total Inorganic Carbon for 2010 Infrastructure Samples with >0.1 wt. % Total Sulphur.

4.2.3 Elemental Analyses

Results of the elemental analyses for 24 samples from the Doris-Windy All-Weather Road are provided in Attachment 7 and summarized in Table 5. The data are again compared to ten times the average crustal abundance for basaltic rocks (Price, 1997). Most parameters are not elevated compared to these screening criteria. Three samples exceed the average basaltic crustal abundance of arsenic, with concentrations of 31 to 49 ppm. One sample has 0.01 ppm mercury and seven samples have selenium content of 0.6 to 1.7 ppm. The values for both these parameters are close to the detection limits, and are therefore within the range of analytical uncertainty.

Table 5: Summary of Elemental Analyses for 24 Samples from the Doris-Windy All-Weather Road

Parameter	Units	P25	Median	P75	Max	Average Crustal Abundance for Basaltic Rocks
Ag	ppm	0.10	0.15	0.23	0.30	0.1
As	ppm	1.6	3.2	10	**48**	2
Au	ppb	1.4	2.4	4.2	9.0	4
Ba	ppm	2.8	8.0	15	195	330
Ca	%	4.6	5.9	7.5	10	7.6
Cd	ppm	0.1	0.2	0.3	0.5	0.2
Co	ppm	37	44	68	111	48
Cr	ppm	40	131	1051	1577	170
Cu	ppm	133	162	185	249	87
Fe	%	5.8	7.2	8.4	11	8.7
Hg	ppm	<0.01	<0.01	<0.01	**0.01**	0.00009
Mg	%	2.5	2.8	3.5	4.2	4.6
Mn	ppm	1307	1757	1917	2364	1500
Mo	ppm	0.3	0.4	0.5	1.0	1.5
Ni	ppm	43	59	549	748	130
P	%	0.032	0.044	0.047	0.078	0.11
Pb	ppm	1.2	2.3	4.2	8.1	6.0
Sb	ppm	0.10	0.15	0.30	0.60	0.2
Se	ppm	**0.6**	**0.6**	**0.8**	**1.7**	0.05
Sr	ppm	17	25	92	279	465
Ti	%	0.10	0.16	0.22	0.34	1.4
U	ppm	0.1	0.1	0.15	0.4	1
V	ppm	138	179	221	309	250
W	ppm	<0.1	<0.1	<0.1	<0.1	0.7
Zn	ppm	66	83	98	118	105

Note: Numbers highlighted in bold exceed 10 times the average crustal abundance for basaltic rocks Price (1997).
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4.3 Pad Area

4.3.1 Visual Observations

The rock excavated from Pad D and Pad R was observed to be green-grey fine grained basalt with trace to 1% disseminated sulphides. Significant calcite veining was present at some locations. Full sample descriptions are provided in Attachment 3.

4.3.2 ABA

Total sulphur and total carbon results for all 10 Pad D and Pad R samples are provided with the elemental analyses in Attachment 4 and summarized in Table 6. The total sulphur was used to calculate the acid potential (AP), and the total carbon (which is equivalent to inorganic carbon in these samples) was used to calculated the total inorganic carbon in units of neutralization potential. These in turn were used to calculate TIC/AP ratios for the full set of samples. Based purely on total sulphur and total carbon data, TIC significantly exceeds acid potential in all of the samples, indicating that all 10 samples from Pad D and Pad R are not potentially acid generating.

Table 6: Summary of Total Sulphur and Carbon Results for Ten Pad D and Pad R Samples

Statistic (n=10)	Total Sulphur Wt. %	Total Carbon Wt. %	AP* kg $CaCO_3$/t	TIC** kg $CaCO_3$/t	TIC/AP
25th percentile	0.05	1.3	1.6	111	59
Median	0.06	1.9	1.9	156	75
75th Percentile	0.08	2.6	2.5	216	93
Maximum	0.14	3.5	4.4	288	142

Notes: *AP=Acid Potential based on total sulphur
**TIC=Total inorganic carbon in units of NP, based on total carbon.
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Of these 10 samples, only two, from Pad R contained >0.1 wt. % total S. ABA results for these samples are provided in Attachment 5 and summarized in Table 7. The results confirm that there are substantial amounts of neutralization potential. The NP/AP ratios are significantly greater than 3 (Figure 3), indicating that the samples are not potentially acid generating. Neutralization potential is well correlated with carbonate content (TIC) indicating that carbonates are the source of the neutralization potential (Figure 4).

Table 7: Summary of Acid Base Accounting Results for Two Samples from Pad R with >0.1 wt. % Total Sulphur

Statistic (n=2)	Paste pH	Total Sulphur Wt. %	Sulphate Sulphur Wt. %	MPA kg $CaCO_3$/t	Modified NP kg $CaCO_3$/t	TIC kg $CaCO_3$/t	NP/AP
25th percentile	8.8	0.13	0.01	3.6	167	162	44
Median	8.8	0.13	0.01	3.8	204	203	56
75th Percentile	8.8	0.14	0.01	3.9	240	245	68
Maximum	8.8	0.14	0.01	4.1	277	286	81

Notes: MPA=Maximum Potential Acidity based on sulphide sulphur; NP = Neutralization Potential; TIC = Total inorganic carbon; AP = Acid Potential.
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4.3.3 Elemental Analyses

Results of the elemental analyses for all 10 samples from Pad D and Pad R are provided in Attachment 4 and are summarized in Table 8. The data are compared to ten times the average crustal abundance for basaltic rocks (Price, 1997) to screen for elevated parameters. Most parameters do not exceed these screening criteria. Three samples exceed the average basaltic crustal abundance of selenium, having up to 0.8 ppm; however, as discussed previously, the data are close to detection limits and are within the range of analytical uncertainty.

Table 8: Summary of Elemental Analyses for 10 Pad D and Pad R Samples

Parameter	Units	P25	Median	P75	Max	Average Crustal Abundance for Basaltic Rocks
Ag	ppm	<0.1	<0.1	<0.1	<0.1	0.1
As	ppm	3.5	5.1	6.5	11	2
Au	ppb	1.5	2.2	3.3	36	4
Ba	ppm	3.8	6.5	9.3	26	330
Ca	%	4.2	6.1	8.4	11	7.6
Cd	ppm	0.25	0.30	0.30	0.80	0.2
Co	ppm	33	38	40	43	48
Cr	ppm	160	167	192	226	170
Cu	ppm	115	119	129	150	87
Fe	%	4.8	5.7	6.1	6.5	8.65
Hg	ppm	<0.01	<0.01	<0.01	<0.01	0.00009
Mg	%	2.3	2.6	3.0	3.9	4.6
Mn	ppm	1208	1481	1601	1807	1500
Mo	ppm	0.20	0.20	0.28	0.60	1.5
Ni	ppm	67	75	81	94	130
P	%	0.017	0.018	0.021	0.023	0.11
Pb	ppm	1.0	5.7	7.5	9.3	6
Sb	ppm	<0.1	<0.1	<0.1	<0.1	0.2
Se	ppm	0.50	0.50	**0.68**	**0.80**	0.05
Sr	ppm	18	20	24	30	465
Ti	%	0.181	0.235	0.249	0.290	1.38
U	ppm	<0.1	<0.1	<0.1	<0.1	1
V	ppm	97	120	151	161	250
W	ppm	0.20	0.20	0.28	0.50	0.7
Zn	ppm	58	80	87	151	105

Note: Numbers highlighted in bold exceed 10 times the average crustal abundance for basaltic rocks from Price (1997).
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5 Conclusions

The results of the road and quarry monitoring programs indicate that all of the samples collected and submitted for testing are not potentially acid generating. Elemental analyses indicate that concentrations of most parameters are within 10 times the average crustal abundance for basaltic rocks. These findings are consistent with the results of testing completed in support of the permit applications for the Doris Mine Area and for the Doris-Windy Road.

6 Recommendations

Construction of roads and infrastructure, including further development of the quarries, is expected to continue in 2011. Therefore, it will be necessary to expand the inspection and sampling programs to cover any new infrastructure components in 2011.

As previously noted, it was not possible to complete shake flask tests on any of the Doris-Windy Road or Quarry samples. Therefore, in 2011, additional samples from the Doris-Windy Road and Quarries should be collected and submitted for shake flask extraction tests to address the requirements outlined in the Quarry management plan.

7 References

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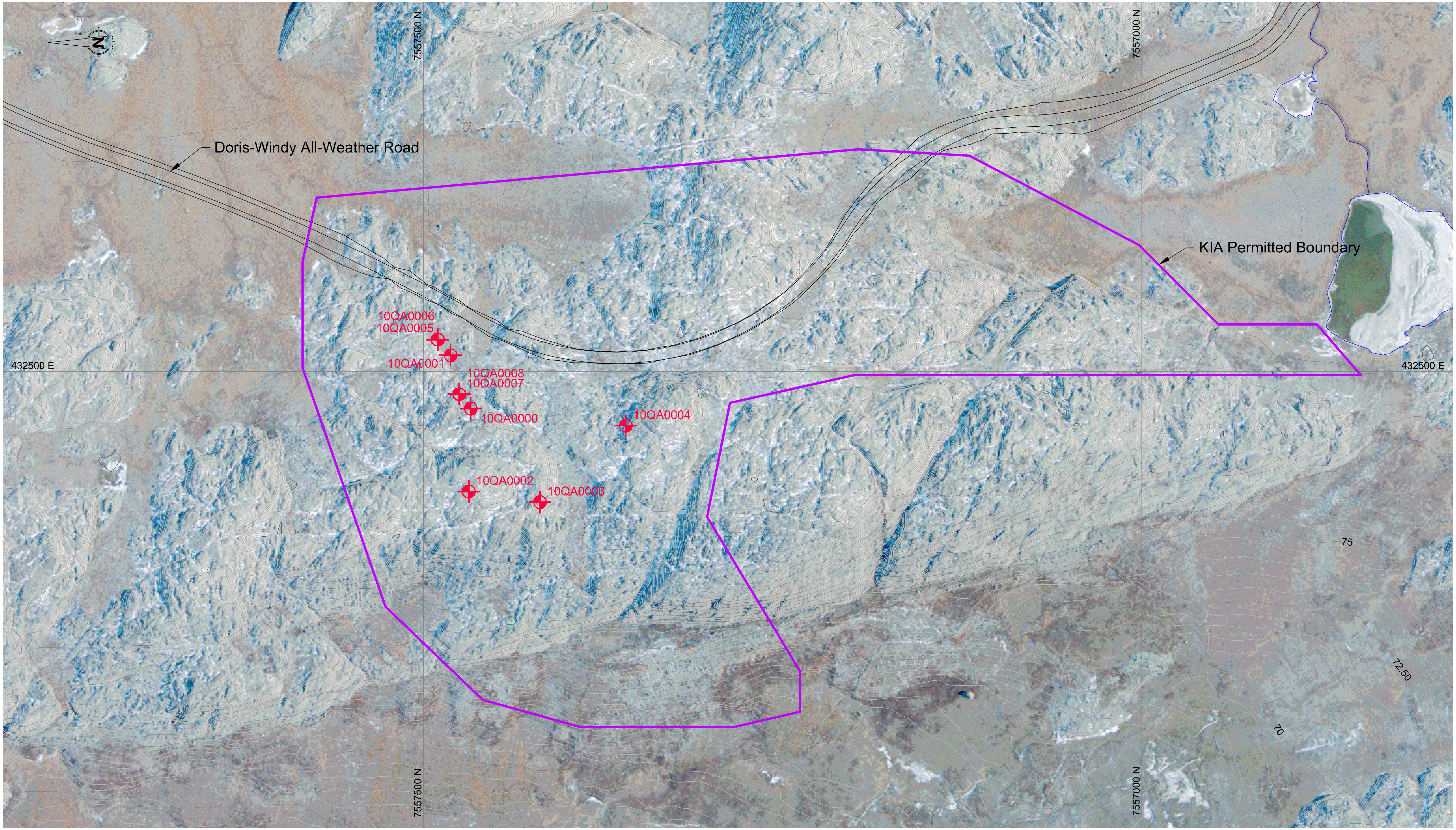
SRK Consulting, 2008. Geochemical Characterization of Quarry Materials for the Doris-Windy All-Weather Road, Hope Bay Project. Report 1CH008.000.300 prepared for Hope Bay Mining Ltd., August 2008.

Price, W.A. 1997. Draft Guidelines and Recommended Methods for the Prediction of Metal Leaching and Acid Rock Drainage at Minesites in British Columbia. British Columbia Ministry of Employment and Investment, Energy and Minerals Division. 159p.

Drawings



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LEGEND

Geochemistry Sample Location

NOTES

1. Topographic contour data for the terrain model were provided by Hope Bay Mining, and is based on 2007 Aerial Photography. Contour intervals are 0.5m.
2. The co-ordinate system is UTM NAD 83, Zone 13.
3. All dimensions are in metric units, unless specifically mentioned.

0 20 40 60 80 100

Scale in Metres

SRK Consulting
Engineers and Scientists
Vancouver B.C.

SRK JOB NO.: 1CH008.023.0001

FILE NAME: Quarry Sampling_w.As-built Lines.dwg

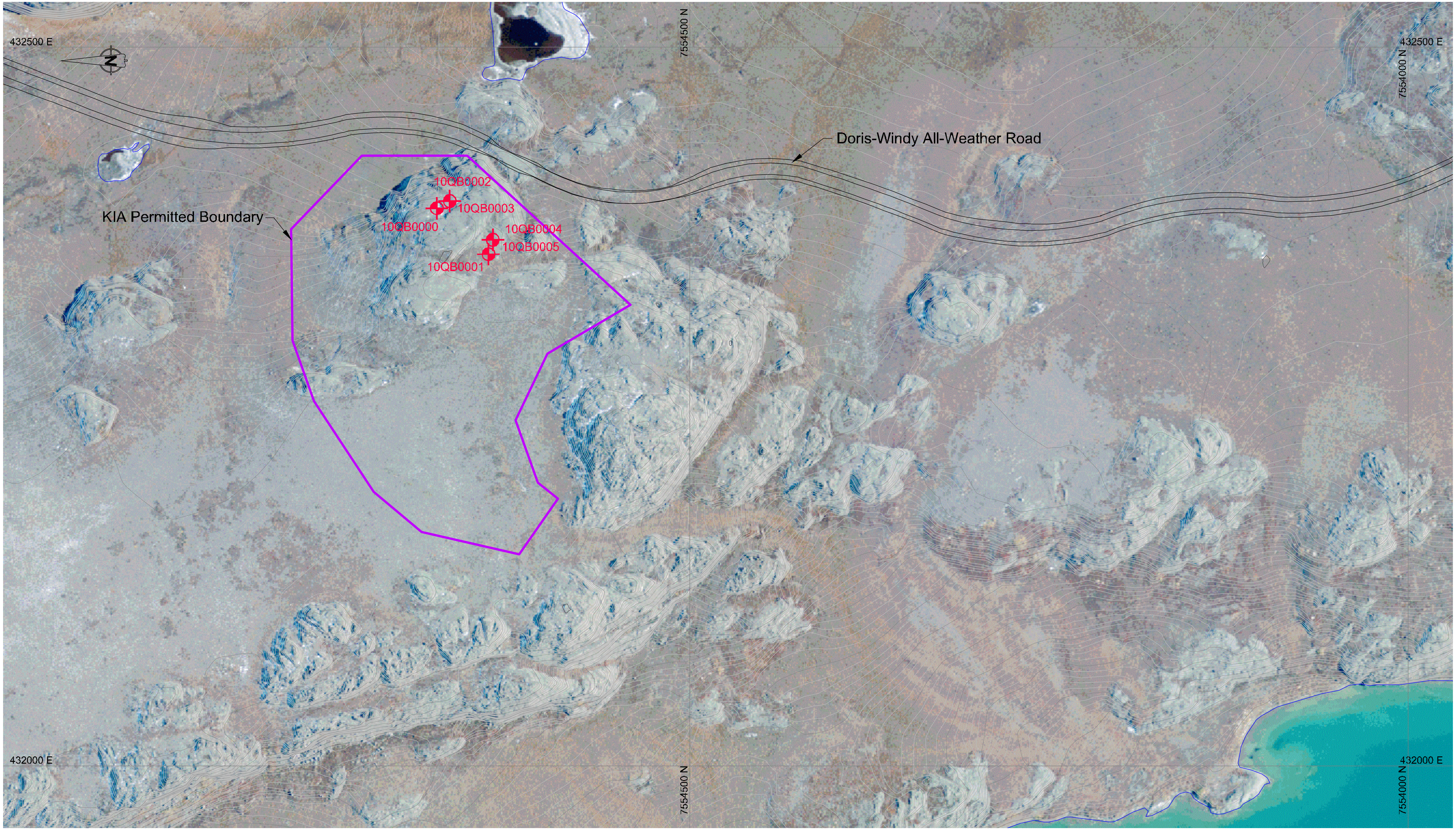
NEWMONT
NORTH AMERICA

HOPE BAY MINING LTD.

Quarry Rock Sampling

Geochemistry Sample Locations
Quarry A Area

DATE:	APPROVED:	FIGURE:
March 2011	KK	1



LEGEND

Geochemistry Sample Location

NOTES

1. Topographic contour data for the terrain model were provided by Hope Bay Mining, and is based on 2007 Aerial Photography. Contour intervals are 0.5m.
2. The co-ordinate system is UTM NAD 83, Zone 13.
3. All dimensions are in metric units, unless specifically mentioned.

0 20 40 60 80 100

Scale in Metres

SRK Consulting
Engineers and Scientists
Vancouver B.C.

SRK JOB NO.: 1CH008.023.0001

FILE NAME: Quarry Sampling_w.As-built Lines.dwg

NEWMONT
NORTH AMERICA

HOPE BAY MINING LTD.

Quarry Rock Sampling

Geochemistry Sample Locations
Quarry B Area

DATE: March 2011 | APPROVED: KK | FIGURE: 2

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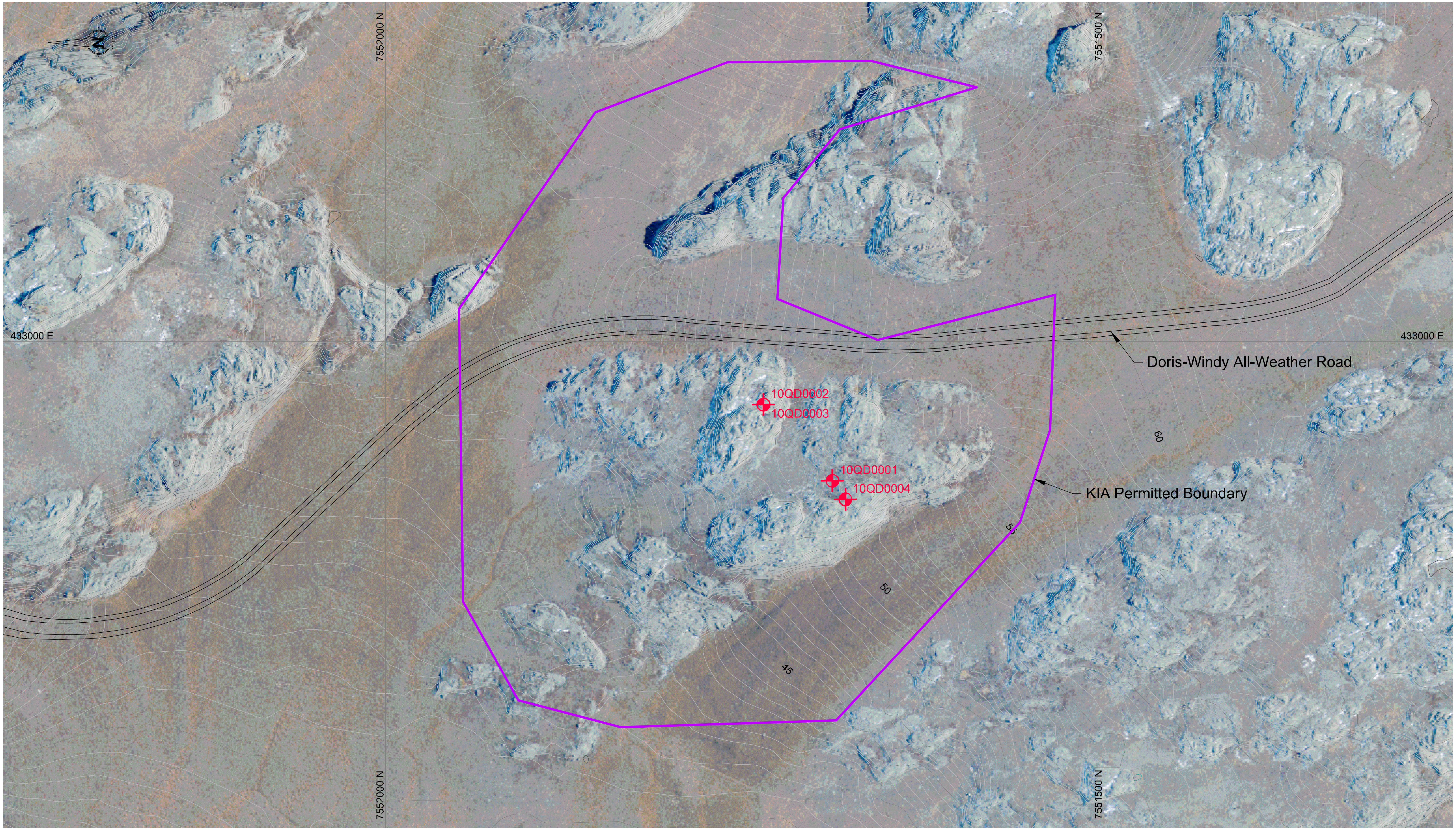

LEGEND

Geochemistry Sample Location

NOTES

1. Topographic contour data for the terrain model were provided by Hope Bay Mining, and is based on 2007 Aerial Photography. Contour intervals are 0.5m.
2. The co-ordinate system is UTM NAD 83, Zone 13.
3. All dimensions are in metric units, unless specifically mentioned.

0 20 40 60 80 100

Scale in Metres

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Engineers and Scientists
Vancouver B.C.

SRK JOB NO.: 1CH008.023.0001

FILE NAME: Quarry Sampling_w.As-built Lines.dwg

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NORTH AMERICA

HOPE BAY MINING LTD.

Quarry Rock Sampling

Geochemistry Sample Locations
Quarry D Area

DATE: March 2011 | APPROVED: KK | FIGURE: 3

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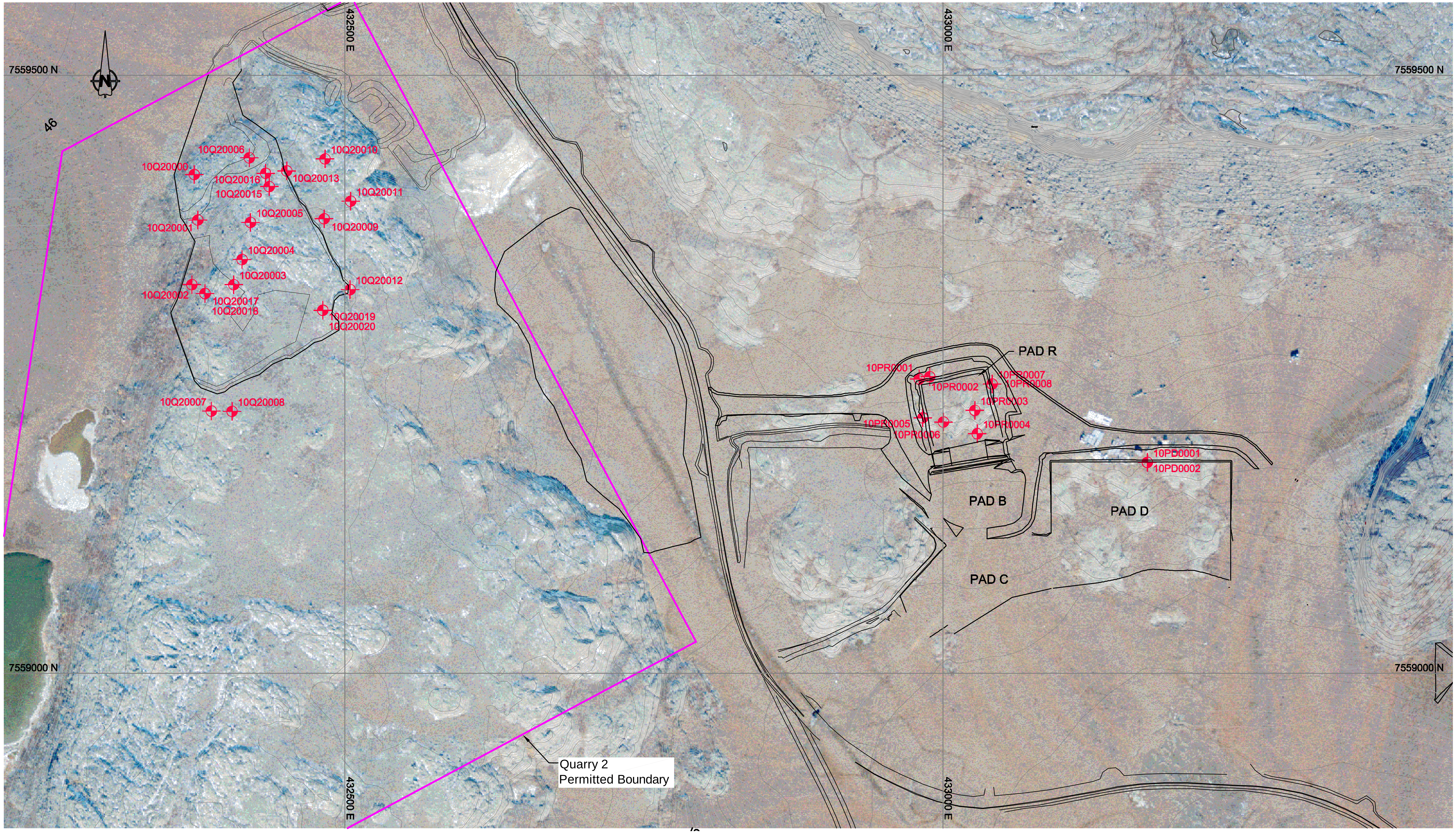


LEGEND

- Geochemistry Sample Location
- Existing Approved and Permitted Quarry
- Existing Roads and Infrastructure

NOTES

1. Topographic contour data for the terrain model were provided by Hope Bay Mining, and is based on 2007 Aerial Photography. Contour intervals are 0.5m.
2. The co-ordinate system is UTM NAD 83, Zone 13.
3. All dimensions are in metric units, unless specifically mentioned.

0 30 60 90 120 150

Scale in Metres

SRK Consulting
Engineers and Scientists
Vancouver B.C.

SRK JOB NO.: 1CH008.023.0001

FILE NAME: Quarry Sampling.dwg

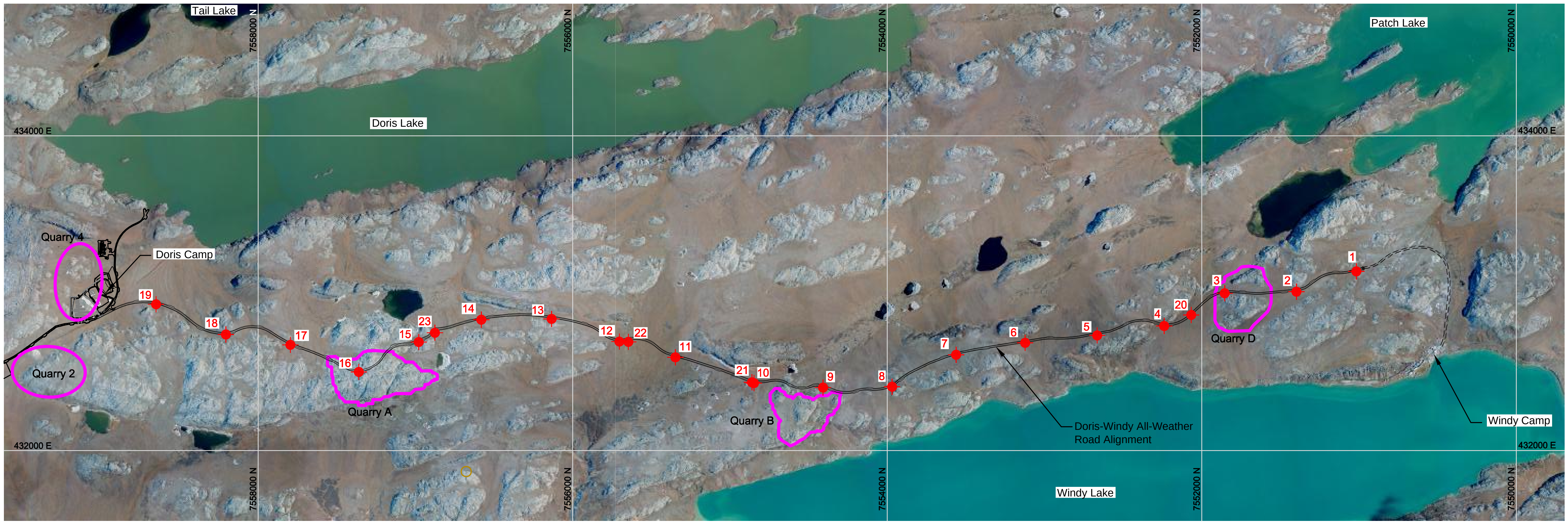
NEWMONT
NORTH AMERICA

HOPE BAY MINING LTD.

Quarry Rock Sampling

Geochemistry Sample Locations
Quarry 2 and Doris Camp Area

DATE:	APPROVED:	DRAWING:
March 2011	KK	4



LEGEND

- Sample Site
- Existing Approved and Permitted Quarry
- Existing Roads and Infrastructure
- Doris-Windy Road (Complete)
- Doris-Windy Road (Incomplete)

NOTES

1. Topographic contour data for the terrain model were provided by Hope Bay Mining, and is based on 2007 Aerial Photography. Contour intervals are 0.5m.
2. The co-ordinate system is UTM NAD 83, Zone 13.
3. All dimensions are in metric units, unless specifically mentioned.

0 200 400 600 800 1000
Scale in Metres

SRK Consulting
Engineers and Scientists
Vancouver B.C.

SRK JOB NO.: 1CH008.031
FILE NAME: Doris Windy road ABA.dwg

NEWMONT NORTH AMERICA

HOPE BAY MINING LTD.

Doris-Windy All-Weather Access Road

2010 Geochemical Solids Sampling

DATE:	APPROVED:	DRAWING:
March 2011	KK	5

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Attachments

Sample #	Location	Hole ID	UTM N	UTM E	Elev (m)	Notes	Date	Sampled By
10QA0000	Quarry A	N/A	7557467	432474	76	fine grain basalt chips from high wall	21-May-10	Correen O'Shea
10QA0001	Quarry A	N/A	7557481	432511	88	fine grain basalt chips from high wall	21-May-10	Correen O'Shea
10QA0002	Quarry A	S26	7557468	432416.3		green fine grain basalt drill cuttings	27-May-10	Correen O'Shea
10QA0003	Quarry A	H56	7557419	432408.9		green fine grain basalt drill cuttings	27-May-10	Correen O'Shea
10QA0004	Quarry A	T40	7557359	432462.1		green fine grain basalt drill cuttings	27-May-10	Correen O'Shea
10QA0005	Quarry A	N/A	7557490	432522		-1cm - 1p, ACODE = 0, fine grained basalt, trace sulphides, significant calcite veining. Hematite staining and epidote with calcite	4-Aug-10	Lisa Swinnard
10QA0006	Quarry A	N/A	7557490	432522		-2mm - 1p, ACODE = 0, fine grained basalt, trace sulphides, significant calcite veining. Hematite staining and epidote with calcite	4-Aug-10	Lisa Swinnard
10QA0007	Quarry A	N/A	7557475	432484		-1cm - 1p, ACODE = 0, fine grained basalt, trace sulphides, significant calcite veining. Hematite staining and epidote with calcite	2-Sep-10	James MacLean
10QA0008	Quarry A	N/A	7557475	432484		-2mm - 1p, ACODE = 0, fine grained basalt, trace sulphides, significant calcite veining. Hematite staining and epidote with calcite	2-Sep-10	James MacLean
10QB0000	Quarry B	N/A	7554676	432388	57	fine grain basalt chips from high wall	21-May-10	Correen O'Shea
10QB0001	Quarry B	N/A	7554640	432356	52	fine grain basalt chips from high wall	21-May-10	Correen O'Shea
10QB0002	Quarry B	N/A	7554667	432393		-1cm - 1a, ACODE = 0, fine grained basalt, trace sulphides, significant calcite veining. Minor qtz veining. Fairly abundant pyrite, present as euhedral cubes across basalt fracture faces, ~1-2% in quarry?	5-Aug-10	Lisa Swinnard
10QB0003	Quarry B	N/A	7554667	432393		-2mm - 1a, ACODE = 0, fine grained basalt, trace sulphides, significant calcite veining. Fairly abundant pyrite, present as euhedral cubes across basalt fracture faces, ~1-2% in quarry?	5-Aug-10	Lisa Swinnard
10QB0004	Quarry B	N/A	7554637	432366		-1cm - 1a, ACODE = 0, fine grained basalt, trace sulphides, significant calcite veining. Minor qtz veining. Fairly abundant pyrite, present as euhedral cubes across basalt fracture faces, ~1-2% in quarry?	2-Sep-10	James MacLean
10QB0005	Quarry B	N/A	7554637	432366		-2mm - 1a, ACODE = 0, fine grained basalt, trace sulphides, significant calcite veining. Fairly abundant pyrite, present as euhedral cubes across basalt fracture faces, ~1-2% in quarry?	2-Sep-10	James MacLean
10QD0000	Quarry D	N/A	7551561	432160	78	Fine grain basalt chips from high wall. GPS elevation suspect.	21-May-10	Correen O'Shea
10QD0001	Quarry D	N/A	7551689	432903	59	fine grain basalt chips from high wall.	21-May-10	Correen O'Shea
10QD0002	Quarry D	N/A	7551737	432956		-1cm - 1p, ACODE = 0, fine grained basalt	4-Aug-10	Lisa Swinnard
10QD0003	Quarry D	N/A	7551737	432956		-2mm - 1p, ACODE = 0, fine grained basalt	4-Aug-10	Lisa Swinnard
10QD0004	Quarry D	N/A	7551680	432890		-1cm. 1a Fine grained basalt. ACODE 0. trace disseminated sulphides. Carbonates Present.	2-Sep-10	James MacLean
10QD0005	Quarry D	N/A	432890	432890		-2mm. 1a Fine grained basalt. ACODE 0. trace disseminated sulphides. Carbonates Present.	2-Sep-10	James MacLean
10Q20000	Quarry 2	N/A	7559417	432374	46	Basalt Chips from high wall.	22-May-10	Correen O'Shea

Sample #	Location	Hole ID	UTM N	UTM E	Elev (m)	Notes	Date	Sampled By
10Q20001	Quarry 2	N/A	7559379	432377	47	Basalt Chips from high wall.	22-May-10	Correen O'Shea
10Q20002	Quarry 2	N/A	7559325	432372	48	Basalt Chips from high wall.	22-May-10	Correen O'Shea
10Q20003	Quarry 2	N/A	7559325	432407	49	Basalt Chips from high wall.	22-May-10	Correen O'Shea
10Q20004	Quarry 2	N/A	7559346	432414	50	Basalt Chips from high wall.	22-May-10	Correen O'Shea
10Q20005	Quarry 2	N/A	7559377	432421	47	Basalt Chips from high wall.	22-May-10	Correen O'Shea
10Q20006	Quarry 2	N/A	7559431	432420	48	Basalt Chips from high wall.	22-May-10	Correen O'Shea
10Q20007	Quarry 2	K18	7559219	432388.3		green grey fine grain basalt drill chips	30-May-10	Correen O'Shea
10Q20008	Quarry 2	G26	7559219	432405.7		green grey fine grain basalt drill chips	30-May-10	Correen O'Shea
10Q20009	Quarry 2	J48	7559380	432482.7		green grey fine grain basalt drill chips	7-Jun-10	Lisa Swinnard
10Q20010	Quarry 2	U25	7559430	432483.4		green grey fine grain basalt drill chips	7-Jun-10	Lisa Swinnard
10Q20011	Quarry 2	V41	7559395	432504.8		green grey fine grain basalt drill chips	14-Jun-10	James MacLean
10Q20012	Quarry 2	F75	7559321	432504.3		green grey fine grain basalt drill chips	14-Jun-10	James MacLean
10Q20013	Quarry 2	F30	7559420	432451.4		green grey fine grain basalt drill chips	21-Jun-10	Lisa Swinnard
10Q20014	Quarry 2	J77				green grey fine grain basalt drill chips	21-Jun-10	Lisa Swinnard
10Q20015	Quarry 2	G29	7559407	432436.7	47.5	green grey fine grain basalt drill chips, 0.2% f.g py	30-Jun-10	Correen O'Shea
10Q20016	Quarry 2	F26	7559418	432433.7	47.5	dark green grey fine grain basalt drill chips, 0.5-1% f.g py	30-Jun-10	Correen O'Shea
10Q20017	Quarry 2	N/A	7559318	432383		-1cm - b-type 1p, ACODE = 0, fine grained basalt, trace sulphides, significant calcite veining. Hematite staining.	21-Jul-10	James MacLean
10Q20018	Quarry 2	N/A	7559318	432383		-2mm - b-type 1p, ACODE = 0, fine grained basalt, trace sulphides, significant calcite veining. Hematite staining.	21-Jul-10	James MacLean
10Q20019	Quarry 2	N/A	7559304	432481.5		-1cm - b-type 1p, ACODE = 0, fine grained basalt, trace sulphides, significant calcite veining. Hematite staining.	2-Sep-10	James MacLean
10Q20020	Quarry 2	N/A	7559304	432481.5		-2mm - b-type 1p, ACODE = 0, fine grained basalt, trace sulphides, significant calcite veining. Hematite staining.	2-Sep-10	James MacLean

Stn ID	UTM1[1]	UTM2	Source Quarry	Description of Sample Point[2]	Date	Time	Sampler	Sample ID		Description of rock samples	Visible Sulphides	Colour of Fines
								Rock	Fines (-2mm)			
1	433139	7551017	Unknown		9/29/2010	8:35 AM	LNB	16401	n/a	Grey-green metavolcanic with brown-red staining. Minor quartz-carbonate veining. Localized very fine grain, disseminated pyrite in trace amounts (<1%).	None to <1% pyrite	n/a
2	433010	7551398	Unknown		9/29/2010	9:11:12AM	LNB	16402	n/a	Grey-green mafic metavolcanics. No visible sulphides. Minor quartz-carbonate veining.	None	n/a
3	433000	7551854	Unknown		9/29/2010	9:41:33AM	LNB	16403	n/a	Grey-green mafic metavolcanics. No visible sulphides. Minor quartz-carbonate veining.	None	n/a
4	432792	7552239	Unknown		9/29/2010	10:19:25AM	LNB	16405	n/a	Mafic metavolcanics. Trace (<1%) disseminated chalcopyrite, both fresh and very oxidized to a red-brown. Quartz-carbonate veining pervasive.	None to <1% chalcopyrite	n/a
5	432732	7552665	Unknown		9/29/2010	10:41:55AM	LNB	16406	n/a	Mafic metavolcanics. Trace (<1%) disseminated, fine grain (mm scale) and fresh pyrite associated with quartz veining.	None to <1% pyrite	n/a
6	432685	7553123	Unknown		9/29/2010	11:04:24AM	LNB	16408	16407	Mafic volcanics. Trace amounts (<1%) of disseminated and unoxidized pyrite. Pyrite present as blebs and distinct crystals, associated with quartz veining.	None to <1% pyrite	medium grey
7	432609	7553562	Unknown		9/29/2010	11:30:25AM	LNB	16409	n/a	Mafic metavolcanics. Localized areas of pyrite, present as i) trace amounts (<1%) of disseminated, cubic and very fine grain pyrite and ii) densely banded, approximately 3 to 5% fine grain (mm scale) cubic pyrite - both unoxidized and with blackish weathering. Occurence of high sulphides was localized to one rock and will likely bias sample as other rocks in sample are low sulphide. Sample area was inspected for occurence of other high sulphide material - none were located.	1-2% pyrite	n/a
8	432406	7553969	Unknown		9/29/2010	12:26:35PM	LNB	16410	n/a	Mafic metavolcanic. Trace (<1%), fresh, very fine grain, disseminated, cubic pyrite. Pyrite associated with phyllitic texture and/or quartz-carbonate veining.	None to <1% pyrite	n/a
9	432401	7554408	Unknown		9/29/2010	12:53:10PM	LNB	16411	n/a	Mafic metavolcanic. Sulphide typically in localized areas as trace (<1%) very fine grain, cubic and fresh pyrite. One occurrence of pyrite in 1 cm band, where pyrite occurred as fine grain (mm scale), disseminated cubes, typically fresh but minor occurences of black weathered faces. Banding associated with phyllitic texture and/or quartz veining.	<1% pyrite	n/a
10	432429	7554847	Unknown	stream crossing 3, south side	10/1/2010	8:00:15AM	LNB	16412	16413	Mafic metavolcanic. No visible sulphides	None	dark grey
11	432593	7555347	Unknown		10/1/2010	9:16:44AM	LNB	16416	16417	Mafic metavolcanic. No visible sulphides. Localized patches of red-brown oxidation present on mm-scale. Possibly weathered sulphides??	None	medium grey-brown
12	432693	7555703	Unknown		10/1/2010	10:08:36AM	LNB	16420	16421	Green-grey mafic metavolcanic. No visible sulphides. Quartz-carbonate veining with iron oxidation on veining (iron carbonates?).	None	grey-black
13	432837	7556134	Unknown		10/1/2010	11:09:37AM	LNB	16423	16422	Mafic metavolcanic. Trace (<1%), fresh and very fine grain pyrite, present as cubes and blebs. Pyrite associated with quartz-carbonate localized veinlets and veins.	None to <1% pyrite	grey-brown
14	432832	7556581	Unknown		10/1/2010	11:40:15AM	LNB	16424	16425	Mafic metavolcanic. No visible sulphides. Quartz-carbonate veining.	None	dark grey
15	432690	7556979	Unknown		10/1/2010	12:24:28PM	LNB	16428	n/a	Mafic metavolcanic. Trace (<1%) disseminated very fine grain pyrite, occuring as blebs and cubes. Pyrite typically fresh but some exhibiting tarnish. Quartz-carbonate veining present.	None to <1% pyrite	n/a
16	432500	7557360	Unknown		10/1/2010	12:46:29PM	LNB	16429	n/a	Mafic metavolcanic. No visible sulphides	None	n/a
17	432672	7557795	Unknown		10/1/2010	1:05:35PM	LNB	16430	16431	Mafic metavolcanics - green-grey and grey-black with greasy texture. Negligible levels of very fine grain pyrite, occuring as disseminations and blebs.	None to <1% pyrite	black
18	432738	7558205	Unknown		10/1/2010	1:32:43PM	LNB	16432	16433	Mafic metavolcanic. Trace (<1%) very fine grain pyrite as disseminations or associated with foliation. Malachite (green-blue precipitate) observed on seived oversize.	None to <1% pyrite	chocolate brown
19	432930	7558649	Unknown		10/1/2010	2:04:17PM	LNB	16434	n/a	Mafic metavolcanic. Trace (<1%) disseminated, very fine grain pyrite.	None to <1% pyrite	n/a
20	432862	7552067	Unknown	opportunistic sampling of fines	9/29/2010	10:02:31AM	LNB	n/a	16404	n/a	n/a	light grey-brown
21	432434	7554860	Unknown	stream crossing 3, north side	10/1/2010	8:35:33AM	LNB	16414	16415	Mafic metavolcanic. No visible sulphides	None	dark grey-green
22	432691	7555646	Unknown	double stream crossing, at middle	10/1/2010	9:48:35AM	LNB	16418	16419	Mafic metavolcanics. Negligble, localized very fine grain, shiny, disseminated pyrite	None	medium grey-green
23	432749	7556876	Unknown	stream crossing 1 (at culvert)	10/1/2010	12:03:04PM	LNB	16426	16427	Mafic metavolcanic. Rare (none to <1%) very fine grain pyrite, occuring as disseminations and veinlets. Pyrite associated with quartz-carbonate veins.	None to <1% pyrite	medium grey

Notes: 1=UTM system is NAD 83
2=All samples taken from the base on the western side of the road.

Attachment 3
2010 Pad Sample Information

Sample #	Location	Hole ID	UTM N	UTM E	Elev (m)	Notes	Date	Sampled By
10PD0001	Pad D	N/A	7559174	433171.6		grey fine grain basalt, trace sulphides, significant calcite veining. Sample -1cm	26-Jul-10	Lisa Swinnard
10PD0002	Pad D	N/A	7559174	433171.6		grey fine grain basalt, trace sulphides, significant calcite veining. Sample -0.2cm	26-Jul-10	Lisa Swinnard
10PR0001	Pad R	Z-85	7559245	432980.8	48	Green fine grain Basalt Drill Chips	June 2 2010	James MacLean
10PR0002	Pad R	Z-95	7559247	432989.6	48	Purple and Green fine grain basalt Drill Chips	June 2 2010	James MacLean
10PR0003	Pad R	AC45	7559220	433026.7	47.35	Green fine grain basalt Drill Chips with ~1% sulphides	June 11 2010	Lisa Swinnard
10PR0004	Pad R	AS36	7559200	433028.7	47.35	Green fine grain Basalt Drill Chips	June 11 2010	Lisa Swinnard
10PR0005	Pad R	AA21	7559214	432989.5	47.35	Green fine grain Basalt Drill Chips	June 20 2010	Lisa Swinnard
10PR0006	Pad R	AG25	7559210	433000.5	47.35	Green fine grain Basalt Drill Chips	June 20 2010	Lisa Swinnard
10PR0007	Pad R		7559242	433031		grey fine grain basalt, trace sulphides, significant calcite veining. Sample -1cm	July 19 2010	James MacLean
10PR0008	Pad R		7559242	433031		grey fine grain basalt, trace sulphides, significant calcite veining. Sample -0.2cm	July 19 2010	James MacLean

ACME ANALYTICAL LABORATORIES LTD.

Client: Maxxam Analytics
File Created: 17-Jan-2011
Job Number: VAN10005759-Rev 4
Number of Samples: 54
Received: 26-Oct-2010

Method	2A Leco	2A Leco	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
Analyte	TOT/C	TOT/S	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	U	Au
Unit	%	%	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	%	PPM	PPM	PPB
MDL	0.02	0.02	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.1	0.5
Pad samples														
10PD0001	2.67	0.05	0.2	119.1	6.1	79	<0.1	71.4	40.1	1585	6.12	3.2	<0.1	3.5
10PD0002	2.91	0.06	0.3	129.5	8.4	80	<0.1	72.3	41.2	1674	6.04	4.3	<0.1	36.2
10PR0001	1.30	0.06	0.1	113.4	0.2	63	<0.1	93.5	40.5	1151	5.94	2.9	<0.1	1.4
10PR0002	2.38	0.08	0.2	72.5	6.7	53	<0.1	54.9	25.1	1606	5.45	3.3	<0.1	1.7
10PR0003	0.48	0.03	0.2	114.5	0.9	52	<0.1	76.8	32.8	825	4.27	7.0	<0.1	2.3
10PR0004	1.41	0.06	0.2	149.6	1.3	88	<0.1	63.7	43.1	1807	6.48	6.5	<0.1	2.6
10PR0005	1.10	0.03	0.1	118.7	0.3	56	<0.1	82.7	35.8	1023	4.76	6.4	<0.1	0.7
10PR0006	1.54	0.14	0.5	117.7	9.3	151	<0.1	91.0	40.2	1479	6.38	11.4	<0.1	6.9
10PR0007	2.21	0.08	0.2	127.3	5.2	84	<0.1	77.3	34.9	1378	4.92	4.2	<0.1	1.1
10PR0008	3.46	0.12	0.6	134.7	7.7	100	<0.1	65.9	31.8	1482	4.77	5.9	<0.1	2.0
Quarry Samples														
10Q20000	1.24	0.11	0.3	86.2	0.4	120	<0.1	28.9	45.5	1767	10.28	1.6	<0.1	0.9
10Q20001	0.87	0.16	0.3	99.7	0.6	86	<0.1	32.1	36.8	1270	7.85	1.8	<0.1	0.5
10Q20002	1.18	0.11	0.3	78.1	0.5	98	<0.1	36.2	41.1	1718	8.14	1.6	<0.1	<0.5
10Q20003	1.10	0.10	0.2	135.6	0.3	65	<0.1	59.3	36.7	1173	5.34	3.0	<0.1	1.9
10Q20004	1.47	0.07	0.1	106.2	0.3	73	<0.1	62.0	37.3	1273	5.45	1.2	<0.1	1.0
10Q20005	1.38	0.06	0.2	100.0	0.5	78	<0.1	58.8	40.5	1367	6.40	1.4	0.1	0.7
10Q20006	1.96	0.19	0.2	99.7	0.9	83	<0.1	49.1	46.1	1436	7.24	16.9	<0.1	2.7
10Q20007	1.41	0.16	4.1	119.2	0.8	76	<0.1	60.2	38.1	1247	5.66	1.0	<0.1	<0.5
10Q20008	1.55	0.14	0.8	135.1	1.5	56	<0.1	63.0	35.1	1054	4.87	0.6	<0.1	2.2
10Q20009	0.31	0.11	1.5	133.4	5.5	44	<0.1	43.4	25.5	620	3.69	3.9	<0.1	1.7
10Q20010	0.79	0.09	<0.1	116.8	0.4	83	<0.1	295.1	54.2	1233	7.42	5.6	<0.1	2.0
10Q20011	1.41	0.05	0.2	102.8	1.6	79	<0.1	71.8	39.0	1369	6.04	1.3	<0.1	0.9
10Q20012	1.27	0.07	0.5	132.2	21.2	103	<0.1	94.2	38.5	1263	6.40	7.3	<0.1	2.0
10Q20013	1.12	0.09	0.2	143.9	1.7	82	<0.1	65.1	38.3	1215	5.27	0.8	<0.1	2.0
10Q20014	0.10	0.05	<0.1	91.2	0.4	59	<0.1	537.1	67.5	803	6.02	1.5	0.1	1.4
10Q20015	1.15	0.09	0.5	130.4	1.0	103	<0.1	74.2	41.8	1877	8.88	0.9	<0.1	1.5
10Q20016	1.62	0.11	0.9	142.9	0.6	114	<0.1	35.1	42.0	1800	9.30	0.9	0.1	1.1
10Q20017	1.99	0.21	0.2	151.7	1.6	88	<0.1	62.2	39.7	1457	6.68	1.3	<0.1	1.4
10Q20018	2.34	0.24	0.2	152.3	2.5	99	<0.1	65.6	40.7	1499	6.84	1.5	<0.1	1.1
10Q20019	1.87	0.05	0.5	97.4	2.4	79	<0.1	307.9	55.4	1167	6.58	3.8	<0.1	3.2
10Q20020	2.54	0.06	1.1	134.4	4.6	80	<0.1	303.9	52.8	1262	6.49	3.9	<0.1	8.3
10QA0000	1.40	0.08	0.1	135.9	1.7	57	<0.1	57.6	34.4	1089	4.80	1.8	<0.1	1.6
10QA0001	0.78	0.06	0.1	135.9	0.6	73	<0.1	61.8	36.3	1037	5.20	1.6	<0.1	0.6
10QA0002	0.81	0.07	0.2	143.0	5.7	63	<0.1	60.5	35.2	1025	4.82	1.0	<0.1	1.9
10QA0003	0.17	0.05	0.2	124.6	23.1	56	<0.1	69.3	33.3	859	5.00	1.0	<0.1	0.6
10QA0004	1.08	0.07	0.2	136.2	11.6	67	<0.1	62.9	35.4	1117	5.05	1.5	<0.1	<0.5
10QA0005	2.45	0.11	0.2	165.0	5.0	110	<0.1	62.2	39.4	1341	5.46	2.7	<0.1	2.6
10QA0006	3.11	0.13	0.4	189.7	6.7	124	<0.1	61.7	39.9	1339	5.28	3.6	<0.1	6.5
10QA0007	2.08	0.12	0.2	156.9	4.2	97	<0.1	59.7	38.2	1200	5.33	2.4	<0.1	3.7
10QA0008	3.00	0.15	0.3	188.8	7.9	114	<0.1	59.0	37.5	1313	5.30	2.9	<0.1	3.0
10QB0000	1.79	0.03	0.5	192.5	0.9	87	<0.1	761.8	84.4	1967	8.64	1.9	<0.1	1.2
10QB0001	1.69	0.05	0.1	119.3	1.0	61	<0.1	49.8	34.6	1545	4.97	1.6	<0.1	2.7
10QB0002	2.23	0.35	0.6	200.6	8.3	156	0.2	536.8	71.8	1878	7.13	4.5	<0.1	14.2
10QB0003	2.54	0.41	0.5	238.9	11.9	192	0.2	511.1	73.2	1860	6.87	4.6	0.1	3.1
10QB0004	2.34	0.22	0.3	153.7	2.1	96	<0.1	56.7	43.0	1440	6.90	9.4	<0.1	2.4
10QB0005	3.00	0.29	0.6	166.7	3.3	107	<0.1	60.0	42.9	1488	6.89	10.2	<0.1	3.1
10QD0000	0.98	0.04	0.1	107.8	0.4	52	<0.1	150.9	40.8	976	4.60	5.0	<0.1	2.8
10QD0001	1.26	0.06	0.1	105.1	0.6	54	<0.1	160.6	43.7	1203	4.82	1.3	<0.1	0.6
10QD0002	2.03	0.16	0.2	125.2	2.4	76	<0.1	65.1	36.6	1087	5.03	4.1	<0.1	8.4
10QD0003	2.79	0.17	0.1	139.8	4.8	82	<0.1	61.7	37.3	1163	4.78	4.0	<0.1	6.0
10QD0004	1.95	0.08	0.2	106.7	1.9	69	<0.1	140.9	42.4	1522	5.49	3.2	<0.1	45.3
10QD0005	2.56	0.12	0.2	99.8	3.2	72	<0.1	138.2	42.6	1523	5.41	3.6	<0.1	4.8

ACME ANALYTICAL LA
Client:
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Number of Samples:
Received:

Method	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
Analyte	Th	Sr	Cd	Sb	Bi	V	Ca	P	La	Cr	Mg	Ba	Ti	B
Unit	PPM	PPM	PPM	PPM	PPM	PPM	%	%	PPM	PPM	%	PPM	%	PPM
MDL	0.1	1	0.1	0.1	0.1	2	0.01	0.001	1	1	0.01	1	0.001	20
Pad samples														
10PD0001	0.2	27	0.3	<0.1	<0.1	143	8.56	0.022	1	164	2.59	6	0.259	<20
10PD0002	0.3	25	0.3	<0.1	<0.1	136	9.10	0.022	2	159	2.58	7	0.218	<20
10PR0001	0.1	30	<0.1	<0.1	<0.1	161	4.03	0.018	1	226	3.90	1	0.229	<20
10PR0002	0.2	17	0.2	<0.1	<0.1	86	7.04	0.014	1	122	1.93	10	0.142	<20
10PR0003	0.1	21	<0.1	<0.1	<0.1	88	2.06	0.018	<1	178	2.25	3	0.244	<20
10PR0004	0.2	15	<0.1	<0.1	<0.1	159	4.79	0.023	1	196	3.25	3	0.290	<20
10PR0005	0.2	20	0.1	<0.1	0.3	96	3.63	0.018	1	169	2.07	7	0.250	<20
10PR0006	0.1	16	0.8	<0.1	<0.1	153	5.14	0.018	<1	201	3.11	6	0.241	<20
10PR0007	<0.1	19	0.3	<0.1	<0.1	104	7.79	0.016	<1	165	2.57	14	0.169	<20
10PR0008	<0.1	20	0.3	<0.1	<0.1	99	11.45	0.015	<1	144	2.45	26	0.122	<20
Quarry Samples														
10Q20000	0.4	17	<0.1	<0.1	<0.1	248	4.15	0.058	5	32	2.04	28	0.132	<20
10Q20001	0.3	24	<0.1	<0.1	<0.1	228	3.18	0.048	4	41	2.36	5	0.352	<20
10Q20002	0.2	19	<0.1	<0.1	<0.1	230	3.12	0.040	4	54	3.20	11	0.185	<20
10Q20003	<0.1	13	<0.1	<0.1	<0.1	139	4.11	0.025	<1	160	2.38	4	0.327	<20
10Q20004	<0.1	13	<0.1	<0.1	<0.1	160	5.23	0.025	<1	165	2.60	4	0.308	<20
10Q20005	0.1	23	<0.1	<0.1	<0.1	210	4.87	0.031	2	143	2.80	10	0.253	<20
10Q20006	0.2	12	<0.1	<0.1	<0.1	177	3.93	0.040	2	81	3.43	19	0.105	<20
10Q20007	<0.1	13	0.1	<0.1	<0.1	137	5.04	0.023	<1	158	2.28	2	0.326	22
10Q20008	<0.1	27	<0.1	<0.1	<0.1	112	5.83	0.025	<1	138	1.73	2	0.379	<20
10Q20009	0.1	32	<0.1	0.1	<0.1	98	1.91	0.028	1	114	1.39	6	0.362	66
10Q20010	0.5	30	<0.1	<0.1	<0.1	146	2.59	0.046	7	464	5.47	3	0.207	<20
10Q20011	0.1	23	<0.1	<0.1	<0.1	179	5.05	0.027	1	183	3.08	13	0.435	<20
10Q20012	0.1	29	0.2	0.3	<0.1	188	4.55	0.026	2	202	3.61	21	0.345	<20
10Q20013	<0.1	15	0.2	<0.1	<0.1	136	4.20	0.025	<1	163	2.38	5	0.380	<20
10Q20014	0.7	4	<0.1	<0.1	<0.1	63	0.57	0.043	6	951	6.70	3	0.126	<20
10Q20015	0.1	10	<0.1	<0.1	<0.1	228	3.94	0.027	1	200	3.79	2	0.331	<20
10Q20016	0.2	31	<0.1	<0.1	<0.1	319	5.42	0.040	3	29	3.19	2	0.433	<20
10Q20017	<0.1	18	0.1	<0.1	<0.1	165	6.84	0.026	<1	163	3.00	5	0.386	66
10Q20018	<0.1	18	0.2	<0.1	<0.1	165	7.86	0.025	<1	155	3.07	6	0.361	77
10Q20019	0.5	47	<0.1	<0.1	<0.1	109	6.08	0.039	7	509	5.66	146	0.133	<20
10Q20020	0.5	56	0.2	<0.1	<0.1	113	8.25	0.040	7	510	5.60	154	0.136	<20
10QA0000	<0.1	22	0.1	<0.1	<0.1	109	5.17	0.024	<1	139	1.71	3	0.353	<20
10QA0001	<0.1	16	0.1	<0.1	<0.1	118	3.14	0.026	<1	152	2.00	2	0.328	<20
10QA0002	<0.1	17	0.1	<0.1	<0.1	109	3.65	0.026	<1	141	1.87	3	0.393	<20
10QA0003	0.1	35	0.1	<0.1	<0.1	109	1.66	0.027	1	148	2.19	2	0.328	<20
10QA0004	<0.1	18	<0.1	<0.1	<0.1	119	4.30	0.025	<1	141	2.06	3	0.333	<20
10QA0005	0.2	20	0.3	<0.1	<0.1	128	8.13	0.023	1	137	2.18	4	0.276	<20
10QA0006	0.3	19	0.4	<0.1	0.2	121	10.17	0.022	2	123	2.01	5	0.229	<20
10QA0007	<0.1	20	0.3	<0.1	<0.1	126	7.26	0.021	<1	139	2.05	2	0.279	<20
10QA0008	0.1	21	0.5	<0.1	<0.1	123	10.02	0.024	1	125	1.99	3	0.255	<20
10QB0000	0.5	177	0.2	<0.1	<0.1	217	6.31	0.050	6	1398	3.22	4	0.314	<20
10QB0001	<0.1	28	<0.1	<0.1	<0.1	121	6.07	0.020	<1	62	2.52	5	0.240	<20
10QB0002	0.5	151	0.9	<0.1	<0.1	173	7.42	0.040	7	923	3.47	26	0.228	<20
10QB0003	0.8	150	1.2	<0.1	<0.1	169	7.88	0.040	9	810	3.25	49	0.186	<20
10QB0004	0.2	17	0.2	<0.1	<0.1	159	7.12	0.030	2	111	2.78	8	0.180	<20
10QB0005	0.2	18	0.2	<0.1	<0.1	151	8.68	0.032	2	110	2.72	10	0.148	<20
10QD0000	<0.1	24	<0.1	<0.1	<0.1	109	3.78	0.020	1	543	3.21	6	0.262	38
10QD0001	<0.1	17	<0.1	<0.1	<0.1	121	4.49	0.020	1	487	3.19	64	0.313	<20
10QD0002	0.2	30	0.2	<0.1	<0.1	131	6.90	0.021	2	227	2.95	5	0.274	36
10QD0003	0.3	26	0.3	<0.1	<0.1	118	9.72	0.019	2	213	2.78	5	0.202	37
10QD0004	0.3	22	0.2	<0.1	<0.1	143	6.72	0.021	2	401	3.53	10	0.275	24
10QD0005	0.3	26	0.2	<0.1	<0.1	133	8.37	0.021	2	387	3.18	13	0.226	29

ACME ANALYTICAL LA
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Job Number:
Number of Samples:
Received:

Method	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
Analyte	Al	Na	K	W	Hg	Sc	Tl	S	Ga	Se	Te
Unit	%	%	%	PPM	PPM	PPM	PPM	%	PPM	PPM	PPM
MDL	0.01	0.001	0.01	0.1	0.01	0.1	0.1	0.05	1	0.5	0.2
Pad samples											
10PD0001	3.53	0.022	0.02	<0.1	<0.01	8.3	<0.1	0.06	7	<0.5	<0.2
10PD0002	3.30	0.022	0.03	<0.1	<0.01	8.0	<0.1	0.08	7	<0.5	<0.2
10PR0001	4.21	0.005	0.02	<0.1	<0.01	16.9	<0.1	0.08	7	<0.5	<0.2
10PR0002	2.48	0.011	0.03	0.5	<0.01	6.7	<0.1	0.10	4	<0.5	<0.2
10PR0003	2.86	0.031	0.02	<0.1	<0.01	4.8	<0.1	<0.05	5	<0.5	<0.2
10PR0004	3.88	0.009	0.01	0.2	<0.01	7.0	<0.1	0.08	8	0.7	<0.2
10PR0005	3.08	0.029	0.03	0.2	<0.01	5.8	<0.1	<0.05	4	0.6	<0.2
10PR0006	3.80	0.023	0.03	0.2	<0.01	10.4	<0.1	0.16	7	<0.5	<0.2
10PR0007	3.10	0.021	0.02	<0.1	<0.01	6.1	<0.1	0.10	6	0.8	<0.2
10PR0008	2.93	0.011	0.02	<0.1	<0.01	5.9	<0.1	0.10	6	0.7	<0.2
Quarry Samples											
10Q20000	4.02	0.029	0.18	<0.1	<0.01	18.9	<0.1	0.12	17	0.6	<0.2
10Q20001	3.30	0.038	0.04	<0.1	<0.01	11.4	<0.1	0.14	14	<0.5	<0.2
10Q20002	3.59	0.042	0.06	<0.1	<0.01	16.1	<0.1	0.10	13	0.6	<0.2
10Q20003	3.20	0.034	0.01	<0.1	<0.01	5.6	<0.1	0.10	7	<0.5	<0.2
10Q20004	3.30	0.033	0.02	<0.1	<0.01	8.2	<0.1	0.06	8	<0.5	<0.2
10Q20005	3.72	0.037	0.08	<0.1	<0.01	14.3	<0.1	0.06	10	<0.5	<0.2
10Q20006	3.73	0.014	0.18	<0.1	<0.01	13.4	<0.1	0.18	9	<0.5	<0.2
10Q20007	3.33	0.024	<0.01	<0.1	<0.01	5.2	<0.1	0.15	7	0.5	<0.2
10Q20008	2.89	0.034	<0.01	0.1	<0.01	5.0	<0.1	0.14	5	<0.5	<0.2
10Q20009	2.06	0.080	0.02	0.4	<0.01	5.8	<0.1	0.10	5	<0.5	<0.2
10Q20010	5.13	0.016	0.01	<0.1	<0.01	9.2	<0.1	0.07	10	<0.5	<0.2
10Q20011	3.92	0.040	0.03	<0.1	<0.01	10.5	<0.1	<0.05	8	<0.5	<0.2
10Q20012	4.61	0.034	0.01	<0.1	<0.01	17.1	<0.1	0.07	9	<0.5	<0.2
10Q20013	3.41	0.035	0.01	<0.1	<0.01	7.0	<0.1	0.08	7	<0.5	<0.2
10Q20014	4.60	0.057	<0.01	<0.1	<0.01	1.9	<0.1	<0.05	8	<0.5	<0.2
10Q20015	5.09	0.022	<0.01	<0.1	<0.01	12.8	<0.1	0.08	12	<0.5	<0.2
10Q20016	4.64	0.023	0.01	<0.1	<0.01	25.5	<0.1	0.11	14	1.0	<0.2
10Q20017	4.04	0.033	0.01	<0.1	<0.01	7.1	<0.1	0.19	8	0.6	<0.2
10Q20018	4.15	0.030	0.01	<0.1	<0.01	7.5	<0.1	0.23	8	0.9	<0.2
10Q20019	5.19	0.033	0.01	<0.1	<0.01	8.0	<0.1	<0.05	10	<0.5	<0.2
10Q20020	5.11	0.042	0.02	<0.1	<0.01	8.7	<0.1	0.05	10	<0.5	<0.2
10QA0000	2.82	0.048	0.01	<0.1	<0.01	5.5	<0.1	0.12	5	<0.5	<0.2
10QA0001	2.81	0.043	<0.01	<0.1	<0.01	5.0	<0.1	0.10	6	<0.5	<0.2
10QA0002	2.89	0.037	0.01	0.3	<0.01	5.0	<0.1	0.10	5	0.6	<0.2
10QA0003	3.06	0.034	<0.01	0.1	<0.01	6.0	<0.1	0.08	6	0.5	<0.2
10QA0004	3.00	0.035	0.02	<0.1	<0.01	6.4	<0.1	0.09	6	<0.5	<0.2
10QA0005	3.16	0.022	0.02	<0.1	<0.01	7.2	<0.1	0.13	7	0.9	<0.2
10QA0006	3.09	0.016	0.02	<0.1	<0.01	6.6	<0.1	0.15	6	0.6	<0.2
10QA0007	2.97	0.032	0.02	<0.1	<0.01	6.6	<0.1	0.14	6	<0.5	<0.2
10QA0008	2.91	0.035	0.02	<0.1	<0.01	6.7	<0.1	0.17	6	0.6	<0.2
10QB0000	3.97	0.022	0.08	<0.1	<0.01	4.0	<0.1	<0.05	15	<0.5	<0.2
10QB0001	3.17	0.025	0.02	<0.1	<0.01	4.5	<0.1	0.06	7	0.7	<0.2
10QB0002	3.33	0.022	0.09	<0.1	<0.01	5.4	<0.1	0.37	12	1.1	<0.2
10QB0003	3.19	0.022	0.08	<0.1	<0.01	5.4	<0.1	0.40	11	0.6	<0.2
10QB0004	3.42	0.016	0.06	<0.1	<0.01	10.7	<0.1	0.23	9	0.9	<0.2
10QB0005	3.48	0.011	0.07	<0.1	<0.01	9.7	<0.1	0.30	8	0.8	<0.2
10QD0000	3.43	0.042	0.03	<0.1	<0.01	5.7	<0.1	<0.05	6	<0.5	<0.2
10QD0001	3.59	0.038	0.04	<0.1	<0.01	5.5	<0.1	0.05	7	<0.5	<0.2
10QD0002	3.54	0.040	0.02	<0.1	<0.01	8.1	<0.1	0.15	7	1.3	<0.2
10QD0003	3.20	0.012	0.02	<0.1	<0.01	6.3	<0.1	0.21	7	1.3	<0.2
10QD0004	3.66	0.029	0.02	<0.1	<0.01	8.5	<0.1	0.12	8	<0.5	<0.2
10QD0005	3.41	0.025	0.02	<0.1	<0.01	7.6	<0.1	0.15	8	1.0	<0.2

Attachment 5
2010 Quarry ABA Results

S. No.	Sample ID	Paste pH	Total Carbon (Wt.%)	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
	Pad Samples											
1	10PR0006	8.8	1.54	5.32	120.9	0.14	0.01	0.13	4.1	129.7	125.6	Strong
2	10PR0008	8.8	3.46	12.58	285.9	0.12	0.01	0.11	3.4	277.3	273.9	Strong
	Quarry Samples											
3	10Q20000	9.4	1.24	4.69	106.6	0.11	<0.01	0.11	3.4	108.2	104.8	Strong
4	10Q20001	9.3	0.87	3.30	75.0	0.16	<0.01	0.16	5.0	81.3	76.3	Strong
5	10Q20002	8.8	1.18	4.36	99.1	0.11	<0.01	0.11	3.4	109.7	106.3	Strong
6	10Q20003	9.0	1.10	4.18	95.0	0.10	<0.01	0.10	3.1	101.1	98.0	Strong
7	10Q20006	9.0	1.96	7.52	170.9	0.19	<0.01	0.19	5.9	149.0	143.1	Strong
8	10Q20007	9.0	1.41	5.13	116.6	0.16	<0.01	0.16	5.0	122.2	117.2	Strong
9	10Q20008	9.0	1.55	5.79	131.6	0.14	<0.01	0.14	4.4	134.4	130.0	Strong
10	10Q20009	9.5	0.31	1.12	25.5	0.11	<0.01	0.11	3.4	37.7	34.3	Strong
11	10Q20016	8.8	1.62	5.94	135.0	0.11	<0.01	0.11	3.4	140.6	137.1	Strong
12	10Q20017	8.8	1.99	7.44	169.1	0.21	<0.01	0.21	6.6	170.4	163.8	Strong
13	10Q20018	8.6	2.34	8.98	204.1	0.24	0.01	0.23	7.2	194.7	187.5	Strong
14	10QA0005	8.7	2.45	8.40	190.9	0.11	0.01	0.10	3.1	198.5	195.4	Strong
15	10QA0006	8.6	3.11	11.70	265.9	0.13	0.01	0.12	3.8	250.9	247.2	Strong
16	10QA0007	8.4	2.08	7.48	170.0	0.12	0.01	0.11	3.4	174.1	170.7	Strong
17	10QA0008	8.1	3.00	11.04	250.9	0.15	0.01	0.14	4.4	249.7	245.3	Strong
18	10QB0002	8.9	2.23	7.74	175.9	0.35	0.01	0.34	10.6	182.2	171.5	Strong
19	10QB0003	8.6	2.54	8.98	204.1	0.41	0.01	0.40	12.5	204.8	192.3	Strong
20	10QB0004	8.8	2.34	8.32	189.1	0.22	0.01	0.21	6.6	180.9	174.3	Strong
21	10QB0005	8.7	3.00	10.89	247.5	0.29	0.01	0.28	8.8	231.6	222.8	Strong
22	10QD0002	9.0	2.03	7.81	177.5	0.16	0.01	0.15	4.7	167.8	163.2	Strong
1	10QD0003	8.8	2.79	10.12	230.0	0.17	0.01	0.16	5.0	233.5	228.5	Strong
2	10QD0005	8.5	2.56	9.42	214.1	0.12	0.01	0.11	3.4	201.6	198.2	Strong
Detection Limits		*0.5*	*0.02*	*0.02*	*0.5*	*0.02*	*0.01*	*0.02*	*0.6*			
Maxxam SOP No:		*7160*	*LECO*	*LECO*	*Calculation*	*LECO*	*7410*	*Calculation*	*Calculation*	*7150*	*Calculation*	*7150*

Notes:

Samples submitted to Maxxam, total sulphur, total carbon and carbonate carbon (CO2; HCl direct method) done by Leco at Acme Labs.
CO2 Analysis: A 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 controlled 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.

2010 Doris-Windy All-Weather Road ABA Results

			Acme		Acme				Mod. ABA NP		
S. No.	Sample ID	Paste pH	CO2 (Wt.%)	CaCO3 Equiv.* (Kg CaCO3/Tonne)	Total Sulphur (Wt.%)	Sulphate Sulphur (Wt.%)	Sulphide Sulphur** (Wt.%)	Maximum Potential Acidity*** (Kg CaCO3/Tonne)	Neutralization Potential (Kg CaCO3/Tonne)	Net Neutralization Potential**** (Kg CaCO3/Tonne)	Fizz Rating
1	16401	9.0	5.63	128.0	0.11	<0.01	0.11	3.4	122.5	119.0	Strong
2	16402				0.03						
3	16403				0.05						
4	16404	8.4	6.36	144.5	0.16	0.01	0.15	4.7	139.6	135.0	Strong
5	16405				0.06						
6	16406	9.0	5.67	128.9	0.16	<0.01	0.16	5.0	130.3	125.3	Strong
7	16407	9.1	9.70	220.5	0.36	0.01	0.35	10.9	223.8	212.9	Strong
8	16408	9.4	3.47	78.9	0.14	<0.01	0.14	4.4	83.1	78.7	Strong
9	16409	9.6	7.50	170.5	1.62	<0.01	1.62	50.6	169.2	118.6	Strong
10	16410	9.3	3.41	77.5	0.12	<0.01	0.12	3.8	80.8	77.1	Strong
11	16411	9.6	6.47	147.0	0.22	<0.01	0.22	6.9	148.7	141.9	Strong
12	16412				0.04						
13	16413	8.8	10.29	233.9	0.27	<0.01	0.27	8.4	229.5	221.1	Strong
14	16414	9.2	9.00	204.5	0.11	<0.01	0.11	3.4	195.2	191.8	Strong
15	16415	9.1	9.70	220.5	0.28	<0.01	0.28	8.8	213.8	205.1	Strong
16	16416				0.05						
17	16417	8.6	11.35	258.0	0.17	<0.01	0.17	5.3	257.6	252.3	Strong
18	16418	9.1	4.60	104.5	0.12	<0.01	0.12	3.8	107.0	103.3	Strong
19	16419	8.6	11.64	264.5	0.16	<0.01	0.16	5.0	259.5	254.5	Strong
20	16420				0.07						
21	16421	8.7	7.13	162.0	0.38	0.01	0.37	11.6	147.2	135.7	Strong
22	16422	7.8	8.60	195.5	0.24	0.01	0.23	7.2	191.9	184.7	Strong
23	16423	9.0	4.02	91.4	0.26	<0.01	0.26	8.1	99.0	90.9	Strong
24	16424	9.0	7.06	160.5	0.17	<0.01	0.17	5.3	157.1	151.8	Strong
25	16425	8.6	8.34	189.5	0.50	0.01	0.49	15.3	176.0	160.7	Strong
26	16426				0.09						
27	16427	9.0	7.13	162.0	0.21	<0.01	0.21	6.6	153.5	147.0	Strong
28	16428				0.09						
29	16429				0.05						
30	16430	8.8	16.04	364.5	0.21	<0.01	0.21	6.6	324.6	318.0	Strong
31	16431	8.6	5.81	132.0	1.19	0.01	1.18	36.9	120.7	83.8	Strong
32	16432				0.04						
33	16433	9.0	4.53	103.0	0.23	0.01	0.22	6.9	109.1	102.2	Strong
34	16434	8.9	11.61	263.9	0.60	<0.01	0.60	18.8	235.8	217.0	Strong
Detection Limits		*0.5*	*0.02*	*0.5*	*0.02*	*0.01*	*0.02*	*0.6*			
Maxxam SOP No:		*7160*	*LECO*	*Calculation*	*LECO*	*7410*	*Calculation*	*Calculation*	*7150*	*Calculation*	*7150*

Notes:

Samples submitted to Maxxam, total sulphur and carbonate carbon (CO2; HCl direct method) done by Leco at Acme Labs.

CO2 Analysis: A 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 controlled 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.

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
1	16401	0.1	109.9	0.9	50	<0.1	75.9	34.3	1266	4.83	1.1	<0.1	2.2	0.1	14
2	16402														
3	16403														
4	16404	0.3	99.6	5.3	71	<0.1	179.3	41.6	1115	4.72	3.9	<0.1	4.3	0.6	14
5	16405														
6	16406	1	248.8	5.9	85	0.1	696.3	111.4	1896	8.01	48	0.1	2.1	0.3	57
7	16407	0.6	200	8.1	111	0.3	545.6	76.7	2116	7.31	6.6	<0.1	2.6	0.5	155
8	16408	0.4	164.4	3.1	89	<0.1	748.2	84.8	1866	8.8	1.3	<0.1	0.8	0.4	72
9	16409	0.5	223.4	1.4	66	<0.1	610.2	72.4	2262	10.54	2	<0.1	2	0.3	152
10	16410	0.3	191	1.2	70	<0.1	727.4	74.5	1434	6.88	1.8	<0.1	1.9	0.4	64
11	16411	0.3	133.6	2.5	59	<0.1	292.9	45.2	1702	6.26	1.2	0.1	1.1	1	162
12	16412														
13	16413	0.6	189	5.2	66	<0.1	560.2	67.8	2193	6.79	2.6	<0.1	4.3	0.6	279
14	16414	0.5	166.7	0.7	70	<0.1	647.4	70.5	1812	6.96	1.3	<0.1	3	0.4	169
15	16415	0.9	150.4	2.2	73	<0.1	330.4	59.3	1921	7.18	3.2	<0.1	6	0.2	172
16	16416														
17	16417	0.4	184	4.2	97	<0.1	57.3	34.9	1254	4.72	1.9	<0.1	1.7	<0.1	18
18	16418	0.2	132.3	0.5	57	<0.1	61.6	32	994	4.61	<0.5	<0.1	1	<0.1	19
19	16419	0.7	146.1	2.1	81	<0.1	55.6	34.9	1302	5.13	2.7	<0.1	0.9	<0.1	17
20	16420														
21	16421	0.4	155.2	2.4	99	<0.1	41.6	42.7	1649	8.54	15.5	0.1	2.7	0.6	16
22	16422	0.4	172.3	6.1	118	<0.1	47.8	41.7	1915	7.41	6.4	0.1	4	0.3	25
23	16423	0.2	113	1.1	60	<0.1	52.1	36.5	1142	5.55	1.1	<0.1	1.3	<0.1	23
24	16424	0.2	120.5	0.8	108	<0.1	35.6	39.9	1863	8.67	1.3	<0.1	<0.5	<0.1	39
25	16425	0.4	149.8	2.4	109	<0.1	38.1	45.7	1852	8.91	14.3	0.1	1.3	0.4	17
26	16426														
27	16427	0.4	132	1.4	101	<0.1	43.9	40	1668	7.7	5.6	<0.1	5	0.2	24
28	16428														
29	16429														
30	16430	0.4	183	0.7	57	<0.1	24.3	34.4	2364	5.93	31.1	<0.1	4.7	0.1	11
31	16431	0.5	193.1	3.3	92	0.1	47.3	50.3	1309	8.06	41.8	0.2	<0.5	1	10
32	16432														
33	16433	0.3	181.6	2.1	88	<0.1	30.1	36.5	1528	8.36	4.8	0.4	2.5	1	28
34	16434	0.2	159	4.3	87	0.2	32.9	60.3	1992	8.56	18.9	<0.1	9	<0.1	23
QAQC															
Duplicates															
10	16410	0.4	197.1	1.4	73	<0.1	721.5	73.6	1447	6.92	1.9	<0.1	0.8	0.4	64
Reference Material (1)															
STD OREAS45PA (1)		0.9	598.7	18.2	116	0.3	290	102.3	1136	16.12	4.2	1.1	44.2	6.2	13
STD OREAS45PA (2)		1.1	614.2	19.4	119	0.3	310.3	110.8	1110	15.36	4.7	1.2	60.9	6.7	14
True Value STD OREAS45PA		**0.9**	**600**	**19**	**119**	**0.3**	**281**	**104**	**1130**	**16.559**	**4.2**	**1.2**	**43**	**6**	**14**
Percent Difference (1)		0.0	-0.2	-4.2	-2.5	0.0	3.2	-1.6	0.5	-2.7	0.0	-8.3	2.8	3.3	-7.1
Percent Difference (2)		22.2	2.4	2.1	0.0	0.0	10.4	6.5	-1.8	-7.2	11.9	0.0	41.6	11.7	0.0
Reference Material (2)															
STD DS7		20.7	103.1	66	374	1	53.8	9.3	624	2.39	53.9	4.6	48.9	4.7	74
True Value STD DS7		**20.5**	**109**	**70.6**	**411**	**0.90**	**56.0**	**9.7**	**627**	**2.39**	**50.0**	**4.9**	**70.0**	**4.4**	**72.0**
Percent Difference		1.0	-5.4	-6.5	-9.0	11.1	-3.9	-4.1	-0.5	0.0	7.8	-6.1	-30.1	6.8	2.8
Detection Limits		*0.1*	*0.1*	*0.1*	*1*	*0.1*	*0.1*	*0.1*	*1*	*0.01*	*0.5*	*0.1*	*0.5*	*0.1*	*1*
Acme Group No.		*1DX*	*1DX*	*1DX*	*1DX*	*1DX*	*1DX*	*1DX*	*1DX*	*1DX*	*1DX*	*1DX*	*1DX*	*1DX*	*1DX*

Note:
Samples submitted to Maxxam, analysis done at Acme Labs.

S. No.	Sample ID	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %
1	16401	<0.1	<0.1	<0.1	119	5.01	0.022	2	229	2.78	6	0.238	<20	3.02	0.011
2	16402														
3	16403														
4	16404	0.2	<0.1	<0.1	81	5.49	0.02	3	438	2.98	8	0.144	44	3.14	0.011
5	16405														
6	16406	<0.1	<0.1	<0.1	231	5.1	0.047	4	1379	3.46	2	0.188	33	4.08	0.004
7	16407	0.5	<0.1	<0.1	184	8.57	0.044	7	1024	2.82	155	0.155	<20	3.28	0.027
8	16408	0.2	<0.1	<0.1	240	3.17	0.055	5	1501	3.3	3	0.209	<20	3.93	0.018
9	16409	0.1	<0.1	<0.1	176	6.97	0.044	4	1233	2.54	3	0.161	257	3.46	0.022
10	16410	0.2	<0.1	<0.1	176	3.1	0.047	5	1577	3.61	2	0.17	<20	3.41	0.011
11	16411	<0.1	<0.1	<0.1	144	6.06	0.078	10	715	2.18	9	0.221	<20	2.92	0.024
12	16412														
13	16413	0.2	<0.1	<0.1	156	9.12	0.048	7	1133	2.46	15	0.163	<20	2.99	0.019
14	16414	<0.1	<0.1	<0.1	182	8.13	0.047	6	1295	2.7	2	0.238	<20	3.51	0.007
15	16415	0.2	<0.1	<0.1	191	7.94	0.035	4	672	3.74	17	0.128	<20	3.7	0.009
16	16416														
17	16417	0.4	<0.1	<0.1	108	10.39	0.021	<1	118	1.79	2	0.226	29	2.66	0.009
18	16418	0.1	<0.1	<0.1	97	4.76	0.023	1	137	1.59	2	0.291	<20	2.72	0.024
19	16419	0.3	<0.1	<0.1	115	10.42	0.02	<1	124	1.97	2	0.209	<20	2.91	0.007
20	16420														
21	16421	<0.1	0.1	0.1	219	4.24	0.045	4	40	3.51	48	0.078	<20	3.94	0.014
22	16422	0.3	<0.1	0.6	215	7.01	0.033	3	82	3.12	13	0.103	<20	3.83	0.01
23	16423	<0.1	<0.1	<0.1	158	4.13	0.028	2	105	1.67	5	0.342	<20	2.97	0.036
24	16424	<0.1	<0.1	<0.1	309	6.07	0.037	2	40	2.57	7	0.051	<20	4.42	0.007
25	16425	0.1	0.1	0.2	245	4.69	0.046	3	26	3.75	11	0.02	<20	4.34	0.007
26	16426														
27	16427	0.1	<0.1	<0.1	221	5.79	0.037	2	77	2.66	11	0.14	<20	3.8	0.009
28	16428														
29	16429														
30	16430	<0.1	<0.1	<0.1	93	7.31	0.038	3	15	4.1	19	0.002	<20	2.52	0.008
31	16431	<0.1	0.2	0.4	154	3.01	0.064	4	22	3.3	16	0.013	<20	3.43	0.004
32	16432														
33	16433	<0.1	<0.1	<0.1	221	3.82	0.047	8	32	2.68	195	0.28	<20	3.29	0.064
34	16434	<0.1	0.6	<0.1	257	6.25	0.043	1	19	4.18	8	0.014	<20	3.98	0.004
QAQC															
Duplicates															
10	16410	0.2	<0.1	<0.1	185	3.08	0.048	5	1585	3.53	2	0.182	<20	3.48	0.011
Reference Material (1)															
STD OREAS45PA (1)		<0.1	0.1	0.2	224	0.24	0.035	14	872	0.1	168	0.126	<20	3.47	0.009
STD OREAS45PA (2)		<0.1	0.2	0.2	220	0.22	0.033	17	798	0.13	173	0.162	<20	3.61	0.006
True Value STD OREAS45PA		**0.09**	**0.13**	**0.18**	**221**	**0.2411**	**0.034**	**16.2**	**873**	**0.095**	**187**	**0.124**		**3.34**	**0.011**
Percent Difference (1)			-23.1	11.1	1.4	-0.5	2.9	-13.6	-0.1	5.3	-10.2	1.6		3.9	-18.2
Percent Difference (2)			53.8	11.1	-0.5	-8.8	-2.9	4.9	-8.6	36.8	-7.5	30.6		8.1	-45.5
Reference Material (2)															
STD DS7		6.4	4.8	4.7	80	0.99	0.078	13	201	1.03	403	0.11	42	1.04	0.098
True Value STD DS7		**6.40**	**4.6**	**4.50**	**84**	**0.93**	**0.080**	**13.0**	**192**	**1.05**	**410**	**0.124**	**39**	**1.020**	**0.089**
Percent Difference		0.0	4.3	4.4	-4.8	6.5	-2.5	0.0	4.7	-1.9	-1.7	-11.3	7.7	2.0	10.1
Detection Limits		*0.1*	*0.1*	*0.1*	*2*	*0.01*	*0.001*	*1*	*1*	*0.01*	*1*	*0.001*	*20*	*0.01*	*0.001*
Acme Group No.		*1DX*	*1DX*	*1DX*	*1DX*	*1DX*	*1DX*	*1DX*	*1DX*	*1DX*	*1DX*	*1DX*	*1DX*	*1DX*	*1DX*

Note:

Samples submitted to Maxxam, a

S. No.	Sample ID	K %	W ppm	Hg ppm	Sc ppm	Tl ppm	S %	Ga ppm	Se ppm	Te ppm
1	16401	0.02	<0.1	<0.01	4.3	<0.1	0.1	7	<0.5	<0.2
2	16402									
3	16403									
4	16404	0.03	<0.1	<0.01	3.2	<0.1	0.11	6	<0.5	<0.2
5	16405									
6	16406	<0.01	<0.1	<0.01	8.3	<0.1	0.12	13	<0.5	<0.2
7	16407	0.08	<0.1	0.01	5.8	<0.1	0.31	12	<0.5	<0.2
8	16408	0.04	<0.1	<0.01	4.6	<0.1	0.11	16	<0.5	<0.2
9	16409	0.08	<0.1	<0.01	2.8	<0.1	1.51	12	1.1	<0.2
10	16410	0.03	<0.1	<0.01	2.5	<0.1	0.1	13	<0.5	<0.2
11	16411	0.3	<0.1	<0.01	4.3	0.2	0.21	12	<0.5	<0.2
12	16412									
13	16413	0.14	<0.1	<0.01	3.4	0.1	0.25	11	0.8	<0.2
14	16414	0.02	<0.1	<0.01	3.1	<0.1	0.06	13	<0.5	<0.2
15	16415	0.08	<0.1	<0.01	13.5	<0.1	0.24	11	<0.5	<0.2
16	16416									
17	16417	0.01	<0.1	<0.01	5.5	<0.1	0.13	6	<0.5	<0.2
18	16418	<0.01	<0.1	<0.01	5	<0.1	0.11	4	0.5	<0.2
19	16419	<0.01	<0.1	<0.01	5.9	<0.1	0.12	6	<0.5	<0.2
20	16420									
21	16421	0.07	<0.1	<0.01	15.9	<0.1	0.34	13	0.6	<0.2
22	16422	0.03	<0.1	<0.01	16.1	<0.1	0.2	11	0.5	<0.2
23	16423	0.02	<0.1	<0.01	11.2	<0.1	0.24	8	0.8	<0.2
24	16424	0.03	<0.1	<0.01	23.7	<0.1	0.13	14	<0.5	<0.2
25	16425	0.07	<0.1	<0.01	19.5	<0.1	0.41	13	0.6	<0.2
26	16426									
27	16427	0.03	<0.1	<0.01	15.1	<0.1	0.19	11	<0.5	<0.2
28	16428									
29	16429									
30	16430	0.13	<0.1	<0.01	8.9	<0.1	0.19	6	0.6	<0.2
31	16431	0.12	<0.1	0.01	12.9	<0.1	1.17	11	1.7	0.2
32	16432									
33	16433	0.16	<0.1	<0.01	13.8	<0.1	0.21	12	<0.5	<0.2
34	16434	0.06	<0.1	<0.01	23.5	<0.1	0.57	13	0.6	<0.2
QAQC										
Duplicates										
10	16410	0.03	<0.1	<0.01	2.5	<0.1	0.1	13	<0.5	<0.2
Reference Material (1)										
STD OREAS45PA (1)		0.08	<0.1	0.03	41.9	<0.1	<0.05	17	<0.5	<0.2
STD OREAS45PA (2)		0.08	<0.1	0.02	47.3	<0.1	<0.05	17	0.8	0.3
True Value STD OREAS45PA		**0.0665**	**0.011**	**0.03**	**43**	**0.07**	**0.03**	**16.8**	**0.54**	
Percent Difference (1)		20.3		0.0	-2.6			1.2		
Percent Difference (2)		20.3		-33.3	10.0			1.2		
Reference Material (2)										
STD DS7		0.47	3.2	0.21	2.4	4	0.19	5	3.1	0.7
True Value STD DS7		**0.44**	**3.4**	**0.2**	**2.5**	**4.20**	**0.19**	**5.0**	**3.5**	**1.18**
Percent Difference		6.8	-5.9	0.0	-4.0	-4.8	0.0	0.0	-11.4	-40.7
Detection Limits		*0.01*	*0.1*	*0.01*	*0.1*	*0.1*	*0.05*	*1*	*0.5*	*0.2*
Acme Group No.		*1DX*	*1DX*	*1DX*	*1DX*	*1DX*	*1DX*	*1DX*	*1DX*	*1DX*

Note:

Samples submitted to Maxxam, a

Appendix B
2010 Waste Rock Monitoring Program

SRK Consulting
Engineers and Scientists

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Memo

To:	File	**Date:**	March 28, 2011
cc:		**From:**	Kelly Sexsmith
Subject:	Geochemical Monitoring Data for the Underground Decline	**Project #:**	1CH008.023

1 Introduction

HBML recently submitted an updated Waste Rock Management Plan for the Doris North project to the Nunavut Water Board (NWB). The plan includes detailed recommendations for segregating the waste rock according to its potential for metal leaching and/or acid rock drainage (ML/ARD), and confirmatory monitoring to establish whether the non-mineralized rock could be used for construction (SRK 2010).

Underground mining commenced in November 2010, and the monitoring program was implemented upon the start of mining. This memo documents the monitoring results that were available as of March 10, 2011 including the results of geological inspections and laboratory testing data. Initial comments on the effectiveness of the segregation program are also provided. The mining to date has been primarily through diabase, which is a relatively uniform type of rock from a geochemical perspective. Therefore, further evaluation of the segregation program is planned once data from other rock types is available.

2 Methods

2.1 Geological Inspections

Detailed protocols for the geological inspections are documented in the Waste Rock Management Plan (SRK 2010). Geological inspections are made at least once per day when the mining is in diabase and alteration zone, and once per shift in other rock units. Where possible, both the working face and the muck pile are inspected to identify the rock type, quantity of sulphide minerals, quartz veining, carbonate mineralization and the presence of fibrous minerals. This data is recorded in geological inspection logs. Inspection logs are provided in Attachment 1. The changes in format of the logs reflect improvements that were made to the forms in early January.

The rock type and sulphide content are used to define whether the waste rock should be considered “mineralized” waste or “non-mineralized” for management purposes.

2.2 Sampling and Sample Preparation

Samples of the blasted rock (muck) were taken at regular intervals within the underground mine. The samples were composited over an individual blast round, typically representing 50 to 100 m^3 of rock. Two types of samples were collected:

- Samples for sulphur (S), total inorganic carbon (TIC) and acid base accounting (ABA) tests included a representative mixture of fine and coarse rock fragments from the pile. These were pulverized prior to testing.

- Samples for Shake Flask Extraction (SFE) tests were sieved through a 1 cm sieve to collect the -1cm size fraction. The -1cm size fraction was subjected to testing.

The frequency of sampling and analysis is summarized in Table 1.

Samples for S, TIC and ABA tests were shipped to ALS Laboratories in Yellowknife for preparation. Splits were sent to ALS for S and TIC analyses at ALS Laboratories in Vancouver, and to Maxxam Laboratories for ABA tests. The samples for SFE tests were shipped directly to Maxaam for testing.

Table 1: Analytical Test Program According to Sample Type and Rock Type / Waste Management Unit

Rock Type / Management Unit	tonnes per sample	Sample Type		
		Random Composite		-1cm fraction
		Total S & TIC	Full ABA	SFE
Diabase	5,000	x x		Jan to Mar 2011: One sample each month Jan, Feb, Mar. Apr to Dec 2011: One sample for every 50,000 tonnes.
Basalt	1,000	x	Every 5th sample	
Gabbro	5,000	x x		
Buffer zone	1,000	x	Every 5th sample	
Alteration zone	5,000 x		x	

2.3 Analytical Methods

The following test methods were used in this program:

- S analyses were completed using the Leco method.
- TIC analyses were completed using the direct coulometric method.
- ABA tests were completed using the Modified Sobek method with sulphur speciation and TIC.
- Elemental concentrations were determined by aqua regia digestion followed by ICP-MS analyses.
- SFE tests were completed using a water to rock ratio of 3:1, with ultrapure deionized water contacting the rock for 24 hours. The leachate was filtered through a 0.45 µm filter and was submitted for analysis of acidity, alkalinity, sulphate, chloride, nitrate, nitrite, ammonia, and a full suite of metals by ICP-MS (including Hg & Se).

S and TIC analyses were completed at ALS. All other tests were completed at Maxxam Laboratories.

3 Results and Discussion

3.1 Geological Inspections

The results of the geological inspections are provided in Attachment 1.

The first several weeks of mining were limited to the portal area. By the end of December, the decline had advanced approximately 70 metres. Geological inspections (Attachment 1a) showed that the majority of the rock was diabase. One small fine grained dyke was also observed on November 23rd. Trace amounts of pyrite were observed in two of the diabase samples. All of the rock was designated as non-mineralized waste (W).

By March 9, 2011 the main decline had advanced a total of 260 metres. From the start of January to March 4, 2011 all of the rock was identified as diabase (11c). Trace amounts of pyrite were observed in a few of the inspections. From March 4 to March 9, the rock was comprised of a mixture of diabase and a larger aphanitic dyke (10B). Elevated concentrations of sulphides were found along the contact of these two rock types and that material was designated as mineralized waste (MW). The central part of the dyke contained only trace amounts of pyrite, and was initially designated and managed as W, but on consultation with SRK, subsequently rounds were handled as MW due to a lack of information on the NP content.

It is noted that some of the diabase was temporarily placed on Pad Q and then later moved to Pad I. Now that underground haul trucks have been incorporated in the mining cycle, this practice has been discontinued. HMBL have collected some additional samples for laboratory testing so that they will be able to correlate specific laboratory tests to the final storage location of this material.

3.2 Laboratory Test Results

Laboratory testing data are provided in Attachment 2.

3.2.1 S and TIC Results

S and TIC results from ALS are available for seven of the samples collected to date, including five diabase samples, one sample of a fine grained dyke, and one sample of an aphanitic dyke. The sulphur content ranged from 0.02% to 0.12%, with a median value of 0.04%. TIC concentrations ranged from <4.5 to 116 kg $CaCO_3$ eq/tonne, with four of the five diabase samples having values of 4.5 kg $CaCO_3$ eq/tonne, and one diabase sample having a value of 17 kg $CaCO_3$ eq/tonne. The fine grained dyke had an NP of 116 kg $CaCO_3$ eq/tonne, and the aphanitic dyke had and NP of 4.5 kg $CaCO_3$ eq/tonne.

On the basis of these results, TIC/AP ratios for all samples except the aphanitic dyke were greater than 3, indicating that they were non-acid generating. The aphanitic dyke had an NP/AP ratio of 2.4, indicating that it had an uncertain potential for ARD. However, given that the sulphur content was only 0.06%, it was considered to present a low risk for ARD.

All of the samples met the criteria of <0.5% visible sulphides for managing the waste rock as non-mineralized waste (W).

3.2.2 ABA Results

Full ABA results are available for the three samples collected in December. The results indicate consistently alkaline paste pH and low sulphur. The two diabase samples had low TIC (3.0 and 26 kg $CaCO_3$ eq/tonne), and low NP content (14 and 34 kg $CaCO_3$ eq/tonne). Both TIC/AP and NP/AP ratios were greater than 3, indicating the diabase was non-acid generating. The fine grained dyke had a relatively high NP of 126 kg $CaCO_3$ eq/tonne, a TIC of 130 kg $CaCO_3$ eq/tonne, and TIC/AP and NP/AP ratios greater than 3, indicating that it was non-acid generating.

These results also show that all of the rock met the criteria for managing the rock as non-mineralized waste (W).

3.2.3 Elemental Analyses

Results of the elemental analyses indicate that concentrations of trace elements were less than 10x average crustal abundances.

3.2.4 Shake Flask Extraction Test Results

Shake flask tests are in progress on two samples. Results are not yet available.

4 Conclusions

The results to date indicate that the underground waste rock is non-acid generating and meets the definitions of non-mineralized waste rock for management purposes. Further regulatory approvals are needed before any of the rock could be designated as suitable for construction. However, these test results show that the material that has been characterized to date (i.e. samples from December) would meet the criteria for use in construction.

Thus far, segregation programs have been effective in identifying mineralized waste. Further assessment will be needed once the decline advances into other more variable types of rock.

5 References

SRK Consulting, 2010. Hope Bay Project Doris North Waste Rock and Ore Management Plan. Prepared for Hope Bay Mining Ltd., December 2010.

Attachments

Attachment 1a - Geological Inspection Logs (November to December 2010)

NEWMONT NORTH AMERICA

Hope Bay Waste Rock Inspection Log

Date of Inspection	Geo	Round taken: Date	Round taken: Time	Source location: heading	round easting	round northing	Face map?	photo	Mining Notes	Key Observations: Lith	Alt: Y/N	Min Y/N	sulph %	carb %	min. Y/N	Geology Notes	n: Pad	Sector	ABA Sample: Y/N	Sample #	pad easting	pad northing	Lift	Sample Notes
7-Nov-10	JS			N5046RP	33358	559127	N	N		DIA									Y	544501				taken 0 - 9m from portal
23-Nov-10	JS			N5046RP	33387	559141	N	N		FGD									Y	544502				taken ~ 40m from portal
28-Nov-10	KG / KM	2010-11-28	6:00	DN decline	33402	559153	N	N	face not visited; geo UG orientation not complete.	DIA	N	N	0	0	N		I	NW	N	N/A				
29-Nov-10	KG			DN decline			Y		no round taken	-	-	-	-	-	-		-	-	N	N/A				
30-Nov-10	KG / JD	2010-11-29	20:00	DN decline	33399	559156	Y	Y	jumbo problems	DIA	N	N	tr	0	N	1 speck Py in muck	I	NW	N	N/A				
1-Dec-10	KG / JD	2010-11-30	21:00	DN decline	33398	559158	Y	N		DIA	N	N	tr	0	N	1 speck Py in muck	I	NW	N	N/A				
2-Dec-10	JD	2010-12-01	18:00	DN decline	33406	559161	Y	Y		DIA	N	N	0	0	N		I	NW	Y	544503				
2-Dec-10	JD	2010-12-02	5:00	DN decline	33401	559160	-	Y	slash LHW for Sump 1	DIA	N	N	0	0	N		I	NW	N	N/A				
		2010-12-02	14:00	DN Sump1	33403	559162	Y	N	2nd slash LHW for Sump 1	DIA	N	N	0	0	N		I	NW	N	N/A				
3-Dec-10	KG	2010-12-03	5:00	DN decline	33407	559164	Y	Y		DIA	N	N	0	0	N		I	NW	N	N/A				
4-Dec-10	KG								no power, no round taken								I	NW	N	N/A				
5-Dec-10	KG	2010-12-05	4:00	DN decline	33411	559167	N	N	no power/fans; did not go U/G. 1/2 of muck still U/G.	DIA	N	N	0	0	N		I	NW	N	N/A				
5-Dec-10	KG	2010-12-05	4:00	DN Sump1	33404	559165	N	N	not a full round. Muck still U/G.								I	NW	N	N/A				
6-Dec-10																	I	NW	N	N/A				
7-Dec-10	KG			DN Sump1	33401	559168	Y	Y		DIA	N	N	0	0	N		I	NW	N	N/A				
12-Dec-10	KG	2010-12-08	18:00	N5038SP	33400	559171	Y	N	Muck moved to Pad I before geologist call.								I	NW	N	N/A				
12-Dec-10	JD	2010-12-09	5:30	N5046RP	33414	559170	Y	N		DIA	N	N	0	0	N		I	NW	N	N/A				
10-Dec-10									**Mining activity stopped until 2011**															

NEWMONT NORTH AMERICA

Hope Bay Waste Rock Inspection Log

Waste Destinati	Date of Inspection	Geo	Activity*	Location**	Mining Notes	Sample Notes	Key Observations: Sulphides	Key Observations: Fibrous Minerals	Follow-up
PAD Q	3-Nov-10	JS	Yes	Doris Portal	ABA sample taken from shot muck 0-9m	Competent drk grn diabase	none observed	none	Sample will be shipped out once have 4
	4-Nov-10	JS	Yes	Doris Portal		Competent drk grn diabase (strg. Horizontal jointing)			
	5-Nov-10		No	Doris Portal	White-out conditions				
	6-Nov-10		No	Doris Portal	Bolter is down				
	7-Nov-10		No	Doris Portal	Bolter is down				
PAD I	8-Nov-10	JS	Yes	Doris Portal		Coarse grained, blkish-grn diabase with trace FeOx on joint surfaces Competent and massive	none observed	none observed	
PAD I	9-Nov-10	JS	Yes	Doris Portal		Competent and massive blkish-grn diabase (coarse grained) Weak FeOx on joint surfaces, but no clay	none observed	none observed	
	10-Nov-10		No	Doris Portal	Jumbo is down				
PAD I	13-Nov-10	JS	Yes	Doris Portal	Decline in ~29m. Waste dumped along W-NW perimeter.		Trace pyrite	none observed	none
	14-Nov-10	JS	Yes	Doris Portal	Slashing inside rib so no face advance.		none observed	none observed	
	15-Nov-10	JS	No	Doris Portal	Bolting face. Back unsupported and unable to approach face		none observed	none observed	
	16-Nov-10	JS	Yes	Doris Portal	Face @ ~33m. Booted round.	Massive, coarse-grained blkish diabase inspected on the surface.	Trace pyrite (1 spec)	none observed	Rock unchanged 0 - 33m.
	19-Nov-10	JS	Yes	Doris Portal	Face @ 41.3m from ST1.	Massive, coarse-grained diabase. Pieces of fine-grained, green, intermediate(?) dike on sill and in shot muck containing ~1% diss. fine-grained py and up to ~3mm wide cc vnlts. Approximately 100 tons and decided to leave in pile.	~1 % fine-grained disseminated py	none observed	
	20-Nov-10	JS	Yes	Doris Portal	Face at ~45m from ST1.	Massive, blkish diabase in face. All Nov. 19 shot muck piled in same location for inspection. No sign of dike material.	none observed	none observed	Jumbo drilling face.
	21-Nov-10	JS	Yes	Doris Portal	Face nor waste pile visited due to whiteout conditions				No outdoor work allowed.
	22-Nov-10	JS	No	Doris Portal	Face nor waste pile visited due to whiteout conditions				No outdoor work allowed.
	23-Nov-10	JS	Yes	Doris Portal	Face not visited due to bolter being in the way		none observed	none observed	
	24-Nov-10	KM	Yes	Doris Portal	Face not visited as could not go alone;waste not checked because it was used to create pad by portal				
	25-Nov-10	KM	Yes	Doris Portal	Face not visited as could not go alone.	Waste all nonmineralized diabase	none observed	none observed	
	26-Nov-10	KM	No	Doris Portal	face not visited as could not go alone.		none observed	none observed	
	27-Nov-10	KM	No	Doris Portal	face not visited as could not go alone.		none observed	none observed	
	28-Nov-10	KG	No	DN decline	face not visited; geo UG orientation not complete. No advance since 25 Nov		none observed	none observed	
	29-Nov-10	KG	Yes	DN decline	Face mapped. Blast end of day.	Not mucked yet.			
	30-Nov-10	KG / JD	Yes	DN decline	Face mapped. Blast early on night shift.		Trace pyrite (1 spec)	none observed	
	1-Dec-10	KG / JD					Trace pyrite (1 spec)	none observed	

Attachment 1c - Geological Inspection Logs (January to March 2011)

Hope Bay Waste Rock Inspection Log

Date of Inspection	Geo	Round taken		Source location								Key Observations								ABA Sample			Stockpile Location				
		Date	Time	Heading	Face ID	round easting	round northing	Round elevation	Face map?	Face photo	Mining Notes	Lith	Alt: Y/N	Min Y/N	sulph %	carb %	fibrous min. Y/N	Geology Notes	Call (W/MW)	Y/N	Sample #	Sample Notes	Pad	Sector	Easting	Northing	Lift (Lift|Elev)
RESUME MINING FOR 2011																											
7-Jan-11	JD	5-Jan-11		N5046RP		33416	559172		Y	N	Two boom jumbo broken down. Drilling with single boom jumbo (3m deep rounds max)	DIA	N	N	0	0	N		W	N	N/A		I	NW			1
8-Jan-11	JD	7-Jan-11	18:40	N5046RP		33418	559175		Y	N		DIA	N	N	0	0	N		W	N	N/A		I	NW			1
9-Jan-11	JD	8-Jan-11	18:30	N5046RP		33419	559177		Y	N	Round ahead in N5046RP with a small slash into N5036SP	DIA	N	N	0	0	N		W	N	N/A		I	NW			1
9-Jan-11	JD	8-Jan-11	18:30	N5038SP		33399	559174		Y	N		DIA	N	N	0	0	N		W	N	N/A		I	NW			1
10-Jan-11	JD	9-Jan-11	19:00	N5046RP		33422	559178		Y	N		DIA	N	N	0	0	N		W	N	N/A		I	NW			1
10-Jan-11	JD	10-Jan-11	3:30	N5038SP		33399	559172		Y	N		DIA	N	N	0	0	N		W	N	N/A		I	NW			1
11-Jan-11	JD	10-Jan-11	19:00	N5046RP		33424	559180		Y	N		DIA	N	N	0	0	N		W	N	N/A		I	NW			1
11-Jan-11	JD	11-Jan-11	4:30	N5038SP		33397	559180		Y	Y	Advance complete for N5038SP	DIA	N	N	0	0	N		W	N	N/A		I	NW			1
12-Jan-11	JD	12-Jan-11	5:00	N5036SP		33415	559179		Y	Y		DIA	N	N	0	0	N		W	N	N/A		I	NW			1
12-Jan-11	JD	12-Jan-11	5:00	N5046RP		33426	559183		Y	N	Air and water lines froze.	DIA	N	N	0	0	N		W	N	N/A		I	NW			1
15-Jan-11	JD	13-Jan-11	17:00	N5046RP		33428	559185		Y	N	White out on Jan 14/15.	DIA	N	N	0	0	N		W	N	N/A		I	NW			1
17-Jan-11	JD	16-Jan-11	5:00	N5046RP		33430	559187		Y	N		11C	N	N	0	0	N		W	N	N/A		I	NW			1
18-Jan-11	JD/KM	18-Jan-11	5:00	N5046RP		33432	559189		Y	N	Dual boom repaired as of today.	11C	N	N	0	0	N		W	N	N/A		I	NW			1
18-Jan-11	JD/KM	18-Jan-11	5:00	N5036SP		33413	559183		Y	Y		11C	N	N	0	0	N		W	N	N/A		I	NW			1
19-Jan-11	JD/KM	19-Jan-11	5:00	N5046RP		33435	559192		Y	Y		11C	N	N	0	0	N		W	Y	544504 544505	Random Composite Sample. Total S, TIC, modified ABA SFE sample. Taken from stockpile on Jan25. Sampled muck sourced from round on Jan 19/11.	I	SW	33146	558996	1|5045
21-Jan-11	JD/KM	20-Jan-11	14:00	N5036SP		33413	559185		Y	Y		11C	N	N	0	0	N		W	N	N/A		I	SW			1
21-Jan-11	JD/KM	21-Jan-11	5:00	N5046RP		33437	559194		Y	N		11C	N	N	0	0	N		W	N	N/A		I	SW			1
22-Jan-11	JD	22-Jan-11	5:00	N5036SP		33411	559189		Y	N		11C	N	N	0	0	N		W	N	N/A		I	SW			1
24-Jan-11	JD	23-Jan-11		N5036SP		33410	559193		N	N		11C	N	N	0	0	N		W	N	N/A		I	SW			1
24-Jan-11	JD	24-Jan-11	3:00	N5046RP		33440	559197		Y	N		11C	N	N	0	0	N		W	N	N/A		I	SW			1
25-Jan-11	JD/KM	25-Jan-11	12:00	N5046RP		33443	559200		Y	Y		11C	N	N	0	0	N		W	N	N/A		I	SW			1
26-Jan-11	JD/KM	26-Jan-11	5:00	N5046RP		33445	559202		Y	Y		11C	N	N	0	0	N		W	N	N/A		I	W			1
27-Jan-11	JD/KM	27-Jan-11	6:00	N5046RP		33448	559205		Y	N	Nuna dumped what looks to be mineralized muck on top of first lift of non-mineralized muck. Need to have Nuna remove muck from current location. Perhaps start a mineralized stockpile?	11C	N	Y	tr	0	N		W	N	N/A		I	W			
28-Jan-11	KM	28-Jan-11				33451	559208					11C	N	N	0	0	N		W	N	N/A		I	W			
29-Jan-11	KG/KM	29-Jan-11	6:00	N5046RP		33453	559211		N	N		11C	N	N	0	0	N	did not see face (orientation)	W	N	N/A		I	W			
31-Jan-11	KG/KM	30-Jan-11	16:00	N5046RP		33456	559214		Y	Y		11C	N	N	0	0	N		W	N	N/A		I	W			
1-Feb-11	KG/KM	31-Jan-11	17:00	N5046RP		33460	559217		N	N		11C	N	N	0	0	N	face loaded, blocked by equipment; not mapped.	W	N	N/A		I	W			
2-Feb-11	KG/KM	1-Feb-11	5:30	N5046RP		33462	559219		N	N		11C	N	N	0	0	N	face not mapped	W	N	N/A		I	W			
2-Feb-11	KG/KM	1-Feb-11	2:00	N5046RP		33464	559222		Y	N		11C	N	Y	tr	0	N	1 speck Py observed	W	N	N/A		I	W			
3-Feb-11	KG/KM	2-Feb-11	17:30	N5046RP		33467	559224		N	N		11C	N	N	0	0	N	face not mapped	W	N	N/A		I	W			
3-Feb-11	KG/KM	3-Feb-11	7:00	N5046RP		33470	559227		Y	Y		11C	N	Y	tr	0	N	2 specks Py observed	W	N	N/A		I	W			

Attachment 1c - Geological Inspection Logs (January to March 2011)

Date of Inspection	Geo	Round taken		Source location								Key Observations								ABA Sample			Stockpile Location				
		Date	Time	Heading	Face ID	round easting	round northing	Round elevation	Face map?	Face photo	Mining Notes	Lith	Alt: Y/N	Min Y/N	sulph %	carb %	fibrous min. Y/N	Geology Notes	Call (W/MW)	Y/N	Sample #	Sample Notes	Pad	Sector	Easting	Northing	Lift (Lift|Elev)
4-Feb-11	KG										no activity; crew change; muck still at face, not bolted								W				I	W			
5-Feb-11	KG	4-Feb-11	3:30	N5046RP		33472	559229		Y	N	1/2 of face blocked (bolter). Face/slash not screened.	11C	N	N	0	0	N		W	N	N/A		I	W			
6-Feb-11											whiteout called after blast								W				I	W			
7-Feb-11											no advance								W				I	W			
8-Feb-11	KG	6-Feb-11	23:30	N5046RP		33472	559230		Y	N	no advance	11C	N	Y	tr	0	N	2 specks Py observed	W	N	N/A		I	W			
9-Feb-11	KG	9-Feb-11	6:00	N5026DE		33467	559216		Y	N		11C	N	N	0	0	N		W	N	N/A		I	W			
10-Feb-11	KG	10-Feb-11	3:00	N5046RP		33476	559234		Y	Y		11C	N	N	0	0	N		W	N	N/A		I	W			
11-Feb-11	KG	10-Feb-11	18:00	N5026DE		33470	559212		Y	Y		11C	N	N	0	0	N		W	Y	544507	Random Composite Sample. Total S, TIC, modified ABA. Taken on Feb 25/11 from RW (JD).	I	W	-	-	
11-Feb-11	KG	11-Feb-11	6:30	N5046RP		33478	559237		Y	N		11C	N	N	0	0	N		W	N	N/A		I	W			
12-Feb-11	KG	12-Feb-11	2:30	N5026DE		33472	559210		Y	N	3 m round	11C	N	N	0	0	N		W	N	N/A		I	W			
13-Feb-11	KG	12-Feb-11	18:00	N5046RP		33480	559239		Y	Y	3 m round	11C	N	Y	tr	0	N	1 speck Py	W	N	N/A		I	W			
13-Feb-11	KG	13-Feb-11	2:00	N5026DE		33475	559208		Y	N	3 m round	11C	N	Y	tr	0	N	1 speck Py	W	N	N/A		I	W			
15-Feb-11	KG	14-Feb-11	?	N5046RP		33482	559242		N	N	3 m round	11C	N	N	0	0	N		W	N	N/A		I	W			
15-Feb-11	KG	14-Feb-11	17:30	N5026DE		33477	559206		Y	Y	3 m round	11C	N	N	0	0	N		W	N	N/A		I	W			
15-Feb-11	KG	15-Feb-11	6:30	N5046RP		33484	559244		Y	Y	3 m round	11C	N	N	0	0	N		W	N	N/A		I	W			
16-Feb-11	KG	15-Feb-11	17:30	N5026DE		33479	559204		Y	Y	3 m round. N5026DE complete.	11C	N	N	0	0	N		W	N	N/A		I	W			
17-Feb-11	KG	16-Feb-11	17:00	N5046RP		33486	559246		Y	Y	3 m round, 7 m face width. Nuna moved all waste from prev 3 wks to 2nd lift Pad Q west side, from portal.	11C	N	N	0	0	N		W	N	N/A		Q				
-	KG	17-Feb-11	12:00	N5046RP					N	N	did not visit face								W								
-	-	18-Feb-11	5:30	N5046RP					N	N									W								
22-Feb-11	JD	21-Feb-11	12:00	N5046RP	DN-N5046RP-20110221	33493	559252		Y	Y		11C	N	N	0	0	N		W	N	N/A		Q				
22-Feb-11	JD	22-Feb-11	1:00	N5022DE	DN-N5022DE-20110222	33493	559234		Y	Y		11C	N	N	0	0	N		W	N	N/A		Q				
23-Feb-11	JD	22-Feb-11	12:00	N5046RP	DN-N5046RP-20110222	33496	559255		Y	Y		11C	N	N	0	0	N		W	Y	544506 544508	Random Composite Sample. Total S, TIC, modified ABA SFE Sample	Q				
23-Feb-11	JD	23-Feb-11	4:00	N5022DE	DN-N5022DE-20110223	33496	559232		Y	Y	Bolter broke down on N/S.	11C	N	N	0	0	N		W	N	N/A		Q				
24-Feb-11	JD	23-Feb-11	18:30	N5046RP	DN-N5046RP-20110223	33499	559258		Y	Y		11C	N	N	0	0	N		W	N	N/A		Q				
25-Feb-11	JD	24-Feb-11	18:00	N5022DE	DN-N5022DE-20110224	33499	559230		Y	Y		11C	N	N	0	0	N		W	N	N/A		Q				
26-Feb-11	JD/KM	25-Feb-11	18:00	N5022DE	DN-N5022DE-20110225	33501	559228		Y	Y	Advance complete for N5022DE	11C	N	N	0	0	N		W	N	N/A		Q				
26-Feb-11	JD/KM	26-Feb-11	6:00	N5046RP	DN-N5046RP-20110226	33501	559260		Y	Y		11C	N	N	0	0	N		W	N	N/A		Q				
27-Feb-11	JD	27-Feb-11	2:00	N5046RP	DN-N5046RP-20110227	33503	559262		Y	N		11C	N	Y	tr	0	N		W	N	N/A		Q				
28-Feb-11	JD/KM	28-Feb-11	1:30	N5046RP	DN-N5046RP-20110228F1	33506	559265		Y	N		11C	N	Y	tr	0	N		W	N	N/A		Q				
1-Mar-11	JD/KM	28-Feb-11	17:30	N5046RP	DN-N5046RP-20110228F2	33509	559268		N	N		11C	N	N	0	0	N		W	N	N/A		Q				
1-Mar-11	JD/KM	1-Mar-11	6:00	N5046RP	DN-N5046RP-20110301	33512	559271		Y	Y		11C	Y	N	0	0	N	Alteration localized along joint plane.	W	N	N/A		Q				
2-Mar-11	JD/KM	2-Mar-11	2:00	N5046RP	DN-N5046RP-20110302F1	33514	559274		Y	Y		11C	N	Y	tr	0	N		W	N	N/A		Q				
3-Mar-11	JD/KM	2-Mar-11	13:00	N5046RP	DN-N5046RP-20110302F2	33518	559278		N	N		11C	N	N	0	0	N		W	N	N/A		Q				
3-Mar-11	JD/KM	3-Mar-11	1:00	N5046RP	DN-N5046RP-20110303F1	33521	559281	5016	Y	Y		11C	Y	N	0	0	N	Alteration localized along joint plane.	W	N	N/A		Q				
4-Mar-11	JD/KM	3-Mar-11	14:00	N5046RP	DN-N5046RP-20110303F2	33523	559283	5016	N	N		11C	N	N	0	0	N	Muck mixed with mineralized rock from DN-N5046-20110304. Therefore moved to mineralized pile.	MW	N	N/A		I	SE			1

Attachment 1c - Geological Inspection Logs (January to March 2011)

Date of Inspection	Geo	Round taken		Source location								Key Observations								ABA Sample			Stockpile Location				
		Date	Time	Heading	Face ID	round easting	round northing	Round elevation	Face map?	Face photo	Mining Notes	Lith	Alt: Y/N	Min Y/N	sulph %	carb %	fibrous min. Y/N	Geology Notes	Call (W/MW)	Y/N	Sample #	Sample Notes	Pad	Sector	Easting	Northing	Lift (Lift|Elev)
4-Mar-11	KM/JD	4-Mar-11	6:00	N5046RP	DN-N5046RP-20110304	33526	559286	5015	Y	Y		11C/10B	Y	Y	2	1	N	Crossed into mafic dyke, very silicified, aphanitic. Qtz veining (5cm wide) along contact between diabase and mafic dyke. Trace to 10 % (highest sulphide content along diabase and mafic dyke contact) py/cp in dyke.	MW	N	N/A		I	SE			1
5-Mar-11	JD/KM	5-Mar-11	1:00	N5046RP	DN-N5046RP-20110305	33529	559289	5015	Y	Y	Moved initial portion of round to mineralized pile on N/S. Once geologist checked muck the rest was moved to NM waste pile. Scoop broken down for most of the day.	10B/11C	Y	Y	tr	1	N	Muck is mainly mafic dyke with trace sulphides (concentrated sulphide content(~3%) in two pieces of muck observed)	W	Y	544510	Random composite sample. Total S, TIC, modified ABA, Au assay.	I	SE			1
6-Mar-11	JD/KM	6-Mar-11	6:00	N5046RP	DN-N5046RP-20110306F1	33532	559292	5014	Y	Y		10B	N	Y	tr	1	N	Round all mafic dyke, very silicified. Fine grained. Trace sulphides. Concentration of hematite and pyrite along joint planes.	W	N	N/A		I	W			3
7-Mar-11	JD/KM	6-Mar-11	21:30	N5046RP	DN-N5046RP-20110306F2	33535	559295	5013	N	N		10B	N	Y	tr	1	N		W	N	N/A		I	W			3
7-Mar-11	JD/KM	7-Mar-11	15:00	N5046RP	DN-N5046RP-20110307	33538	559298	5013	Y	Y		10B	N	Y	tr	1	N		W	N	N/A		I	W			3
8-Mar-11	JD/KM	8-Mar-11	6:00	N5046RP	DN-N5046RP-20110308	33540	559300	5012	Y	Y		10B	Y	Y	tr	1	N		W	Y	544511	Random composite sample, Total S, TIC.	I	W			3
9-Mar-11	JD/KM	9-Mar-11	1:00	N5046RP	DN-N5046RP-20110309	33543	559304	5011	Y	Y	Water lines frozen. Delay in mining.	10B	N	Y	tr	1	N	Recommended to send silicified mafic rock as mineralized waste until we know what the AGP is. What has already been dumped on the non-mineralized stockpile is ok to stay where it is.	MW	N	N/A		I	SE			1

Hope Bay Info									**ALS**	***ABA***				**Maxxam**	***ABA***								
									ID	*S*					*Paste*	*Total*	*Sulphate*	*Fizz*	*CO2*	*Neutralization*			
Sample ID	Rock Code	Rock Type	Geology Notes	Program	Test type	Lab	Date shipped	Call (W/MW)	ALS ID	Total S	TIC	TIC/AP	File ref.	Maxxam ID	Paste pH	Total Sulphur	Sulphate Sulphur	Fizz Rating	CO2	Mod. NP	TIC	NP/AP	TIC/AP
										%	kgCaCO3/t					%	%		%CO2	kgCaCO3/t	kgCaCO3/t		
544501	DIA	Diabase	#N/A	WRMP	ABA	ALS/Maxx	7-Jan-11	W	544501	0.05	27.3	17.45	YW11001704	RXJ 544501	8.28	0.04	-0.01	Moderate	1.16	33.8	26.4	27.0	21.1
544502	FGD	Fine grained dyke	#N/A	WRMP	ABA	ALS/Maxx	7-Jan-11	W	544502	0.11	113.6	33.06	YW11001704	RXJ 544502	8.98	0.12	-0.01	Strong	5.72	126.1	130.0	33.6	34.7
544503	DIA	Diabase	#N/A	WRMP	ABA	ALS/Maxx	7-Jan-11	W	544503	0.01	4.5	14.55	YW11001704	RXJ 544503	8.48	-0.02	-0.01	None	0.13	14.3	3.0	22.9	4.7
544504	11c	Diabase	#N/A	WRMP	ABA	ALS/Maxx	26-Feb-11	W	544504	0.02	4.5	7.27	YW11031973	544504									
544505	11c	Diabase	#N/A	WRMP	SFE	Maxx	26-Feb-11	W	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
544506	11C	Diabase	#N/A	WRMP	ABA	ALS/Maxx	26-Feb-11	W	544506	0.03	4.5	4.85	YW11031973	544506									
544507	11C	Diabase	#N/A	WRMP	ABA	ALS/Maxx	26-Feb-11	W	544507	0.04	4.5	3.64	YW11031973	544507									
544508	11C	Diabase	#N/A	WRMP	SFE	Maxx	26-Feb-11	W	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
544510	10B/11C	Aphanitic dyke	Muck is mainly mafic dyke with trace sulphides (concentrated sulphide content(~3%) in two pieces of muck observed)	WRMP	ABA	ALS/Maxx	8-Mar-11	W	544510	0.06	4.5	2.42	YW11037333	544510									
544511	10B	Aphanitic dyke		WRMP	ABA	ALS	10-Mar-11	W	544511					544511									

ICP

Ag_ppm	Al_%	As_ppm	Au*_ppb	B_ppm	Ba_ppm	Bi_ppm	Ca_%	Cd_ppm	Co_ppm	Cr_ppm	Cu_ppm	Fe_%	Ga_ppm	Hg_ppm	K_%	La_ppm	Mg_%	Mn_ppm	Mo_ppm	Na_%	Ni_ppm	P_%	Pb_ppm	S_%	Sb_ppm	Sc_ppm	Se_ppm	Sr_ppm	Te_ppm	Th_ppm	Ti_%	Tl_ppm	U_ppm	V_ppm	W_ppm	Zn_ppm
Ag	Al	As	Au*	B	Ba	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Se	Sr	Te	Th	Ti	Tl	U	V	W	Zn
ppm	%	ppm	ppb	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	%	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm
-0.1	2.43	0.7	4.4	-20	17	-0.1	2.04	-0.1	23.1	38	252.2	4.54	9	-0.01	0.13	4	1.01	561	0.2	0.32	33.4	0.052	5.7	-0.05	-0.1	4.3	-0.5	38	-0.2	0.4	0.246	-0.1	-0.1	244	-0.1	78
-0.1	3.31	1.2	-0.5	-20	14	-0.1	4.78	0.2	37.9	115	141	6.11	9	-0.01	0.04	3	2.32	1244	0.3	0.033	54	0.032	1.7	0.12	-0.1	10.4	-0.5	27	-0.2	0.3	0.239	-0.1	-0.1	185	-0.1	86
-0.1	2.16	-0.5	5	-20	18	-0.1	1.36	0.1	22.3	8	267.5	4.3	9	-0.01	0.14	4	0.72	373	0.3	0.446	38	0.051	2.1	-0.05	-0.1	2.2	-0.5	45	-0.2	0.3	0.292	-0.1	-0.1	290	-0.1	67
#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

Appendix C
2010 Quarry Rock Seepage Monitoring Program

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Memo

To:	File	**Date:**	March 28, 2011
cc:		**From:**	Larry Amskold Christina James Kelly Sexsmith
Subject:	2010 Hope Bay Quarry Seepage Monitoring Program	**Project #:**	1CH008.023

1 Introduction

As part of the verification, monitoring, and quarry management plans for the Hope Bay Project, HBML are required to monitor seep surveys around the roads, airstrip, camp area and quarries. SRK were asked to complete the seepage surveys in 2009 and 2010. Results of the 2009 seep survey are reported in the "*Hope Bay Quarry Monitoring Report*" (SRK 2009).

This memo presents results of the 2010 freshet seep survey. Construction of an all-weather access road between Doris camp and Windy Lake was underway at the time of monitoring. The 2010 seepage survey includes a detailed seep survey around the Doris North road, the completed portion of the Doris-Windy road, the airstrip, camp area and quarries in the Doris area. The seepage program was completed in accordance with conditions outlined in Part D "Conditions Applying to Construction" Item 21 of Water License 2AM-DOH0713 (Nunavut Water Board 2007) and the *Quarry A, B & D Management and Monitoring Plan, Revision 01* (SRK 2010).

2 Methods

2.1 Seep Survey and Sample Collection

The seep survey was carried out between June 18 and June 24, 2010. Seep survey locations were established by walking the toes of all roadways, building pads and quarry sites along the Doris-North and Doris-Windy roads (Figures 1 to 8). Samples from reference points (not subject to mine influences) were collected in the vicinity of the Doris-Windy road (Figures 4, 5 and 8). One field and one travel blank were collected to provide quality control.

pH and electrical conductivity were measured in the ephemeral seeps present at the time of monitoring. Measurements were also taken where precipitation runoff and snowmelt comes into contact with rock along the roadways, building pads and quarry sites, as well as at reference points.

During the 2009 seepage survey, at some locations flows were observed on both the upstream and downstream side of the road. Because active hauling was occurring during the time of monitoring in 2010, simultaneous access to both sides of the Doris North road by one field team was not possible and therefore it was not possible to see if the seeps were crossing underneath the road.

Field measurements were taken at all locations where flow was observed flowing into or out of construction rock material. A total of 103 sites, including three reference points, were established and field pH and electrical conductivity measurements were taken.

A minimum of at least 10% of the total sample set were submitted for laboratory analysis, regardless of the values of measured field pH and EC. A total of 21 samples, including reference points, were collected and submitted for analysis. Six of the sites were selected for analysis because they had field pH greater than 8.0. An additional 15 sites representing flowing seeps that clearly originated from quarries or facilities that were constructed using quarry rock were randomly selected for analysis. All three reference site samples and the field and travel blanks were selected for analysis.

2.2 Laboratory Analysis

Samples were submitted to ALS-Chemex, Vancouver BC for analysis of nutrients (ammonia and nitrate), routine parameters (pH, alkalinity and sulphate) and dissolved metals by ICP-MS.

3 Results

3.1 Field Observations and Measurements

A complete record of field measurements is provided in Appendix A.

3.1.1 Seepage Sites

Many of the road-side seepage sites were affected by dust at the time of monitoring. In some cases, dust was observed to be accumulating on the water surface. Dust appeared to be interfering with pH measurements at several stations sampled on June 20th, 2010. The pH meter was cleaned and recalibrated, and pH was rechecked at these stations. Rechecked values were used in the interpretation of field data. Rechecked pH values are bolded in Appendix A.

Relatively few seeps were observed around Robert's Bay pad. Air temperatures in this area were lower than near Doris Lake and several snow piles remained surrounding the rock used for development. It was hypothesized that snow inside the development rock may have not yet melted. Similarly, snow piles were observed between Quarries A and B on the Doris-Windy Road. This may account for the low number of seeps observed around this road.

The distribution of samples according to field pH and conductivity readings is shown in Table 1. The majority of the sampled sites (82% or 85 sites) had field pH measurements between 7 and 8. 9% (9 sites) had pHs greater than 8, and 9% (9 sites) had pHs between 6.5 and 7. Most of the sites where the pH was greater than 8 were located around Doris Camp and in the Doris North road (Figures 1 to 3). Many of these were in areas where dust from the road was present and estimated flows were low. The combination of fine particle size, low flow rates and the presence of carbonate minerals likely contributed to the higher pH values. One sample had a measured pH greater than 9. This was located near Roberts Bay adjacent to Doris North road (Figure 1). Sample locations where the measured pH was between 6.5 and 7 were also generally located around Doris Camp and along the Doris North road (Figures 1 to 3). There were also two locations along the Doris-Windy road where the measured pH was between 6.5 and 7.

Table 1: Distribution of Samples according to Field pH and Conductivity (EC)

	Number of Samples		
	pH 6.5 to 7	**pH 7 to 8**	**pH 8 to 8.5**
EC > 500 µS/cm	3	41	1
EC ≤ 500 µS/cm	6	44	8

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The measured field conductivity ranged from 44 µS/cm to 8700 µS/cm, with calculated mean and median values of 790 µS/cm and 330 µS/cm, respectively. 83% of the values were below 1000 µS/cm and 57% were below 500 µS/cm. The majority of samples where high conductivities were measured were located between the camp area and the Doris Lake pad (Figure 3). The sites where the measured conductivities were greater than 1000 µS/cm were generally at locations where there was little to no flow.

3.1.2 Reference Sites

The field pH for the three reference sites ranged from 6.3 to 6.9 and the field conductivity ranged from 45 to 105 µS/cm. The measured pH and conductivity at reference sites were lower than the pH and conductivity values typically measured at seepage sites.

3.2 Laboratory Analysis

A summary of water quality analyses is presented in Table 2. Complete results are presented in Appendix B.

3.2.1 Samples with Field pH greater than 8.0

Six of the nine samples where the field pH was greater than 8 were submitted for laboratory analysis. For all samples, the laboratory pHs were less than the field pHs. The field pH ranged from 8.1 to 9.2 and the lab pH ranged from 7.2 to 8.1. Bicarbonate (alkalinity) was the dominant anion in these samples, ranging from 23 mg/L as $CaCO_3$ to 155 mg/L as $CaCO_3$. Sulphate concentrations were below detection limits in three of the samples (either 5.0 mg/L or 0.5 mg/L) and ranged from 2.3 to 13 mg/L in the remaining three samples.

Ion balance calculations indicate that five of the six samples were anion-deficient, with percent differences of 11% to 138%. There was one sample that was cation-deficient, with a 44% difference between the equivalences of cations and anions. Chloride was not included in the analyses, and may be partly responsible for the charge imbalance in samples where there is an anion deficiency. Additional contributors to charge-imbalance may be the analytical uncertainty for low ionic-strength samples and difference between laboratory-measured and field-measured alkalinity values. For the sample where there was a cation-deficiency, the concentration of calcium was lower than other samples of similar pH range. Calcium was the major cation in five of the samples with concentrations ranging from 10 mg/L to 53 mg/L. The sodium concentration ranged from 2 to 22 mg/L and was the dominant cation in one of the samples.

Ammonia concentrations ranged from below detection limit (0.01 mg/L as N) to 0.32 mg/L as N. Nitrate concentrations ranged from 0.014 mg/L to 0.7 mg/L as N.

Copper was the only dissolved metal that was higher than the CCME guideline for the protection of freshwater aquatic life. Copper concentrations ranged from 0.00089 mg/L to 0.0054 mg/L and were higher than the guidelines in 4 of the samples (HB-43, HB-48, HB-58 and HB-81). The remainder of dissolved metals were all either below detection or below guidelines. Aluminum concentrations ranged from 0.0061 mg/L to 0.019 mg/L, arsenic concentrations ranged from 0.00013 mg/L to 0.0012 mg/L, and nickel ranged from 0.00051 mg/L to 0.0016 mg/L. Cadmium, lead and zinc were not detected in any samples.

Table 2: Summary of Water Quality Results

Group	Sample ID	pH	Alkalinity	SO_4	Ammonia	Nitrate	D-Al	D- As	D-Cd	D-Cu	D-Pb	D-Ni	D-Zn
	Units	s.u.	mg $CaCO_3$/L	mg/L	mg N/L	mg N/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	CCME guideline	**6.5 - 9**			**	**2.9**	**0.1**	**0.005**	**0.000017**	**0.002 - 0.004**	**0.001**	**0.025**	**0.03**
Samples with field pH > 8.0	HB - 20	7.7	23	2.3	0.040	0.054	0.010	<0.0004	<0.00005	0.00089	<0.00005	<0.0005	<0.001
	HB - 39	8.0	36	<0.5	<0.01	0.020	0.09	0.00013	<0.00005	0.0013	<0.00005	<0.0005	<0.001
	HB - 43	8.1	88	<5	0.011	0.014	0.016	0.0012	<0.00005	**0.0051**	<0.00005	0.00093	<0.001
	HB - 48	8.0	83	<5	0.012	0.068	0.017	0.00036	<0.00005	**0.0054**	<0.00005	0.0011	<0.001
	HB - 58	7.2	78	5.9	0.023	0.16	0.015	0.00016	<0.00005	**0.0026**	<0.00005	0.00051	<0.001
	HB - 81	7.9	155	12	0.32	0.69	0.012	0.00031	<0.00005	**0.0045**	<0.00005	0.0016	<0.001
Typical (pH 7-8) Seepage Samples	HB - 7	8.0	94	35	0.20	1.1	0.0061	<0.0006	<0.00005	**0.0024**	<0.00005	0.00072	<0.001
	HB - 11	8.0	126	117	0.71	**4.7**	0.0068	<0.0022	<0.0001	**0.0064**	<0.0001	0.0027	<0.002
	HB - 36	8.0	125	149	0.24	**3.6**	0.0041	<0.0014	<0.0001	0.0011	<0.0001	0.0011	<0.002
	HB - 44	8.0	124	0.50	0.14	0.031	0.0092	0.00080	<0.00005	**0.0031**	<0.00005	0.0010	<0.001
	HB - 45	7.3	76	<5.	0.018	<0.005	0.027	0.00028	<0.00005	**0.0044**	<0.00005	0.0020	0.0018
	HB - 55	8.2	86	3.2	0.016	0.42	0.010	0.00074	<0.00005	**0.0028**	<0.00005	0.0015	<0.001
	HB - 62	8.3	103	6.7	0.059	0.77	0.011	0.00034	<0.00005	**0.0041**	<0.00005	0.0013	<0.001
	HB - 64	6.7	32	4.5	<0.01	0.014	0.056	0.00013	<0.00005	**0.003**	<0.00005	0.00066	<0.001
	HB - 66	8.1	70	2.4	0.015	0.021	0.018	0.00017	<0.00005	**0.0025**	<0.00005	0.0019	0.0011
	HB - 74	8.3	90	3.3	0.025	0.37	0.010	0.00061	<0.00005	**0.0036**	<0.00005	0.0018	<0.001
	DW - 3	8.1	56	2.6	<0.01	<0.005	0.0070	0.00012	<0.00005	**0.0033**	<0.00005	0.00087	0.0016
	DW - 4	8.1	66	4.0	<0.01	0.097	0.0093	0.00020	<0.00005	**0.0038**	<0.00005	0.0011	0.0012
	DW - 6	8.0	69	6.1	0.081	**2.9**	0.013	0.00018	<0.00005	**0.0068**	<0.00005	<0.0005	<0.001
	DW - 12	7.7	45	<5	0.049	0.15	0.032	0.00015	<0.00005	**0.0023**	<0.00005	0.0020	0.0020
	DW - 14	8.0	67	0.87	0.0063	0.14	0.0050	0.00013	<0.00005	0.0016	<0.00005	<0.0005	<0.001
Reference Points	Reference 1	7.5	23	<5	0.0051	<0.005	0.056	0.00018	<0.00005	0.0012	<0.00005	0.0025	0.0042
	Reference 2	7.2	21	<0.5	0.040	<0.005	0.022	<0.0001	<0.00005	0.00098	<0.00005	0.00055	0.0013
	Reference 3	7.7	36	<0.5	0.0075	<0.005	0.051	0.00016	<0.00005	0.0017	<0.00005	0.00060	<0.001

Notes: * bold values are greater than the CCME guideline for protection of freshwater aquatic life.
** guideline is pH and temperature dependent.
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3.2.2 Typical (pH 7 to 8) Seepage Samples

Seepage samples where the measured field pH was between 7 and 8 were much more common than samples where pH was greater than 8. 15 samples were submitted for laboratory analyses. For the seepages that had a field pH between 7 and 8, the laboratory-measured pH ranged from 6.7 to 8.3, and was generally higher than the pH measured in the field. Alkalinity values ranged from 32 mg/L to 126 mg/L as $CaCO_3$. Bicarbonate was the dominant anion in all but one sample, where sulphate was the dominant anion (HB-36). The concentration of sulphate ranged from 0.5 mg/L to 149 mg/L and was not detected in three of the samples. All the seepages were anion-deficient, with equivalents difference ranging from 14% to 102%. Similarly to the seepages that had a field pH of greater than 8, the absence of chloride measurements, analytical imprecision for low ionic-strength solutions and differences in lab versus field alkalinity is likely responsible for the calculated anion deficiency. Ammonia and nitrate concentrations are generally higher than samples with pH greater than 8. Ammonia ranged from below detection limit (0.01 mg/L as N) to 0.71 mg/L as N. Nitrate concentrations were also generally higher than high-pH seeps, and ranged from below detection (0.005 mg/L) to 4.7 mg/L as N. Nitrate concentrations exceeded the CCME guidelines for protection of freshwater aquatic life in three samples (HB-11, HB-36, and DW-6).

Consistent with seepage samples where the field pH was greater than 8, the dominant cation was either calcium or sodium. Calcium concentrations ranged from 7.3 mg/L to 148 mg/L and were the major cation at twelve of the 15 seepage locations. Sodium ranged from 3.4 mg/L to 187 mg/L and was the dominant cation at the three remaining seepage locations.

Dissolved metal concentrations were similar to the range of values measured in samples with pH greater than 8. Aluminum ranged from 0.0041 mg/L to 0.056 mg/L, arsenic was detected in all 15 samples and ranged from 0.00012 to 0.00080 mg/L. Cadmium and lead were not detected and nickel and zinc were not detected or were close to detection limit. The concentration of copper ranged from 0.0016 mg/L to 0.0068 mg/L and was higher than the CCME guideline for the protection of freshwater aquatic life at 13 seepage locations.

3.2.3 Reference Point Samples

The laboratory-measured pH for the three reference point samples ranged from 7.2 to 7.6. Bicarbonate was the dominant anion and the measured alkalinity ranged from 21 mg/L as $CaCO_3$ to 36 mg/L as $CaCO_3$. Sulphate was below the detection limits. Anion values were generally lower than those measured in seeps that have been influenced by quarry materials. As with other seepage locations, the reference seeps were anion-deficient; as discussed previously, this is likely a result of the omission of chloride from the analysed parameters. Nitrate was not detected in any of the reference samples and ammonia ranged from 0.0051 mg/L as N to 0.04 mg/L as N.

Calcium was the dominant cation for all three reference point locations and concentrations ranged from 6.0 mg/L to 10 mg/L. Sodium concentrations ranged from 2.3 mg/L to 8.9 mg/L.

Dissolved metal concentrations are generally similar to those measured at other seepage locations. Notably, the concentration of copper was not higher than CCME guidelines.

4 Discussion

The majority of Hope Bay seepage samples had pH between 7 and 8, 9% were greater than pH 8, and 9% were between 6.5 and 7.0. None of the samples were acidic. Samples with the highest pH were generally in the vicinity of Doris Camp. In contrast, the reference point locations had lower pH values, between 7.2 and 7.6. Approximately half the samples had conductivity values greater than 500 μS/cm. Higher pH and conductivity in the seepage can be attributed to the dissolution of carbonate minerals from the waste rock. The electrical conductivity of seepage waters was generally higher in 2010 than in 2009. This may simply reflect differences in the timing of the survey, and therefore differences in the flow conditions. However, it was noted that hauling and construction occurred during sampling and that conditions were dusty. The fine dust particles are expected to be more reactive due to small particle size, and their presence may have led to higher conductivity and dissolved solids in the seepage water samples. It is our understanding that efforts to suppress dust have increased since the time of the survey. These include increased watering, and a trial to test an approved dust suppressant (EK 35) in high traffic areas. These efforts should help to minimize the effects of dust on seepage quality in the future.

There were no major differences in major ion, nutrient or metal concentrations between samples grouped according to pH. Nutrient and metal concentrations were typically low. Nitrate was higher than CCME guidelines for freshwater aquatic life in 3 of the 21 seeps submitted laboratory analysis. The elevated nitrate in the seepage samples is most likely a result of blasting activities. Copper concentrations were greater than CCME guidelines for 17 of the 21 seeps, but were not higher than guidelines in the reference locations. In contrast, in the 2009 seepage survey, copper in all reference locations was higher than CCME guidelines. In 2010, seep sampling occurred during the spring freshet, while in 2009 the seep sampling occurred after the spring freshet. During spring freshet, the higher volumes of snowmelt and rainfall may have resulted in increased dilution in the reference seeps, whereas after freshet, there may be more interaction between these waters and the underlying soils. Overall, the results were consistent with 2009 results (SRK 2009).

5 Recommendations

A number of the 2010 samples reported poor ion balances. These samples tended to have higher sodium concentrations in comparison to samples with good ion balances. Chloride should be added to the analytical suite in future surveys.

Although there has now been three seep surveys carried out along the road and airstrip between Roberts Bay and the Doris Camp, there has been additional construction and placement of rock in this area. Therefore, the seepage surveys in this area should be continued. Seep surveys around the Doris mine area and along the Doris Windy road should continue for at least two more years to meet the licence requirements.

Further work is required to establish an appropriate set of reference stations that reflect similar geological conditions and terrain, but that are outside of the influence of the mining activities.

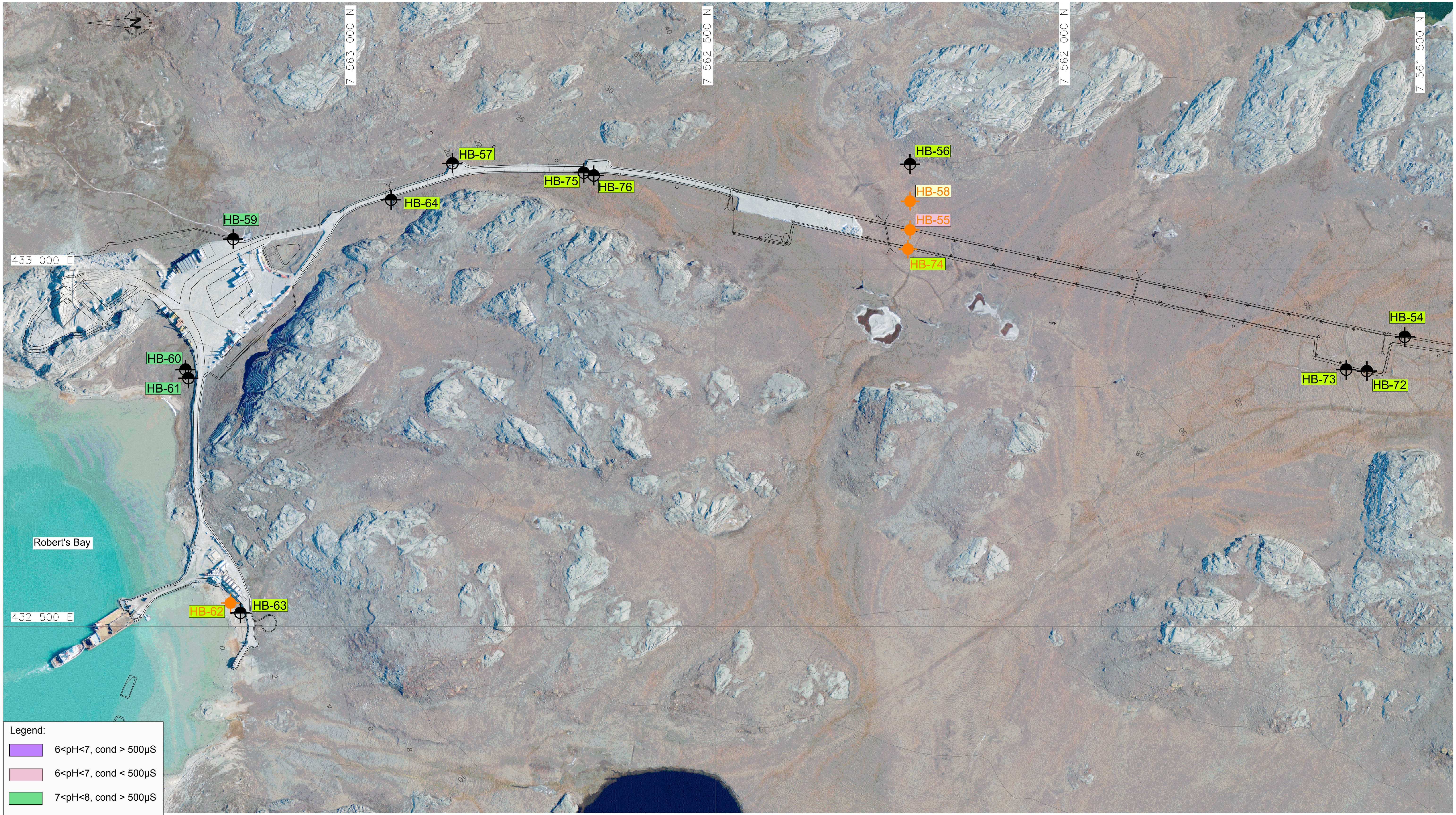
6 References

Nunavut Water Board. 2007. Licence No: 2AM-DOH0713. September 19, 2007.

SRK Consulting, 2009. Hope Bay Quarry Monitoring. Report 1CH008.023 prepared by SRK Consulting (Canada) Ltd. for Hope Bay Mining Ltd . November 2009.

SRK Consulting, 2010. Quarry A, B & D Management and Monitoring Plan. Report 1CH008.038.002 prepared by SRK Consulting (Canada) Ltd. for Hope Bay Mining Ltd. October 2010

Figures



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- 6<pH<7, cond < 500µS
- 7<pH<8, cond > 500µS
- 7<pH<8, cond < 500µS
- pH>8, cond > 500µS
- pH>8, cond < 500µS
- Sample Submitted for Chemical Analysis

1:5000 — 0 100 200 300 Meters

SRK Consulting Engineers and Scientists Vancouver B.C.	HOPE BAY MINING LTD.	Quarry Rock Seepage Monitoring
		Seep Survey Locations North
SRK JOB NO.: 1CH008.023.0001	Hope Bay Gold Project	DATE: Jan. 2011 | APPROVED: CJ | FIGURE: 1
FILE NAME: Doris site–Layout LA.dwg		

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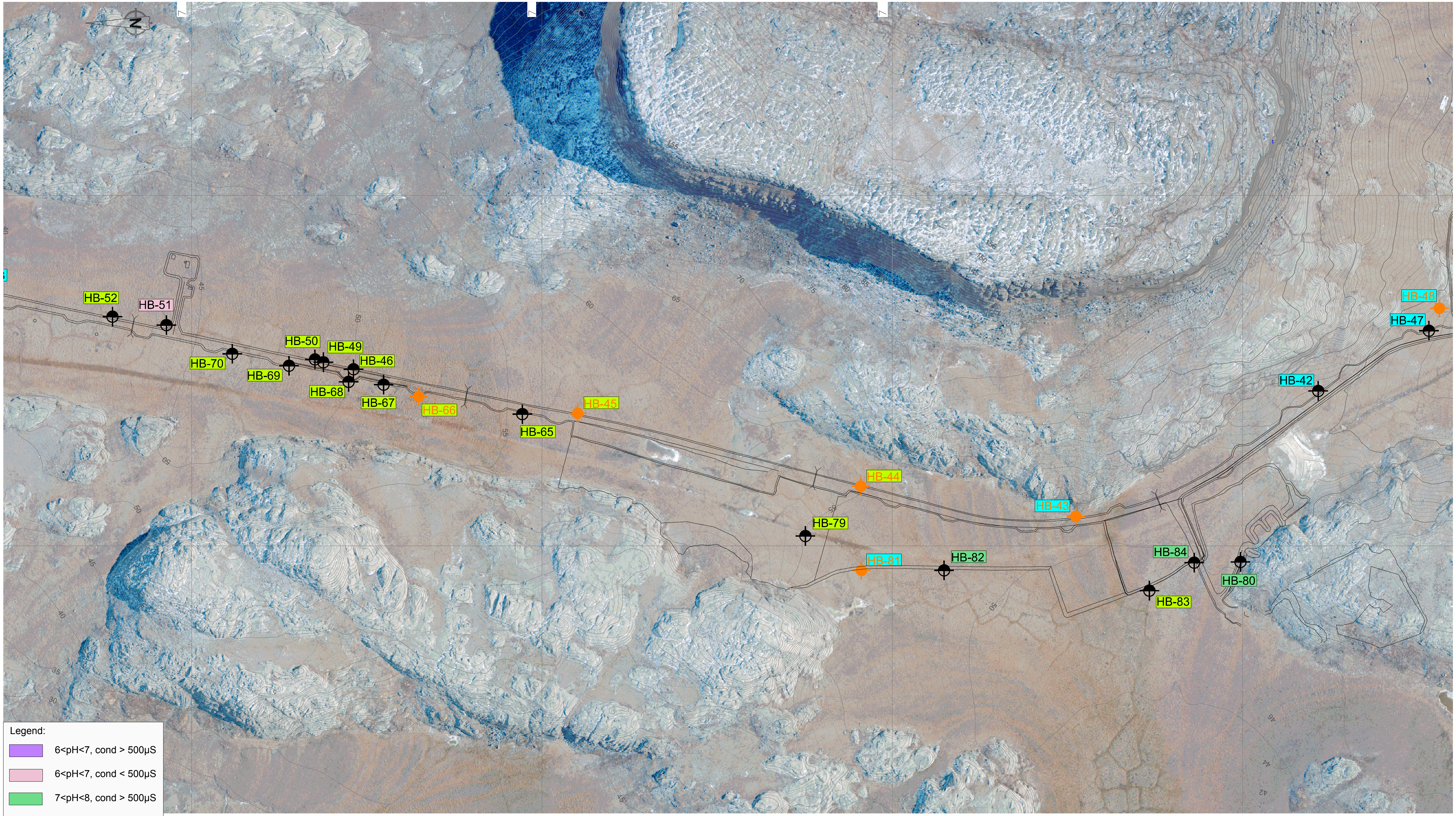

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- 6<pH<7, cond < 500µS
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- 7<pH<8, cond < 500µS
- pH>8, cond > 500µS
- pH>8, cond < 500µS
- Sample Submitted for Chemical Analysis

1:5000 0 100 200 300 Meters

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SRK Consulting Engineers and Scientists Vancouver B.C.	HOPE BAY MINING LTD.	Quarry Rock Seepage Monitoring
		Seep Survey Locations Central
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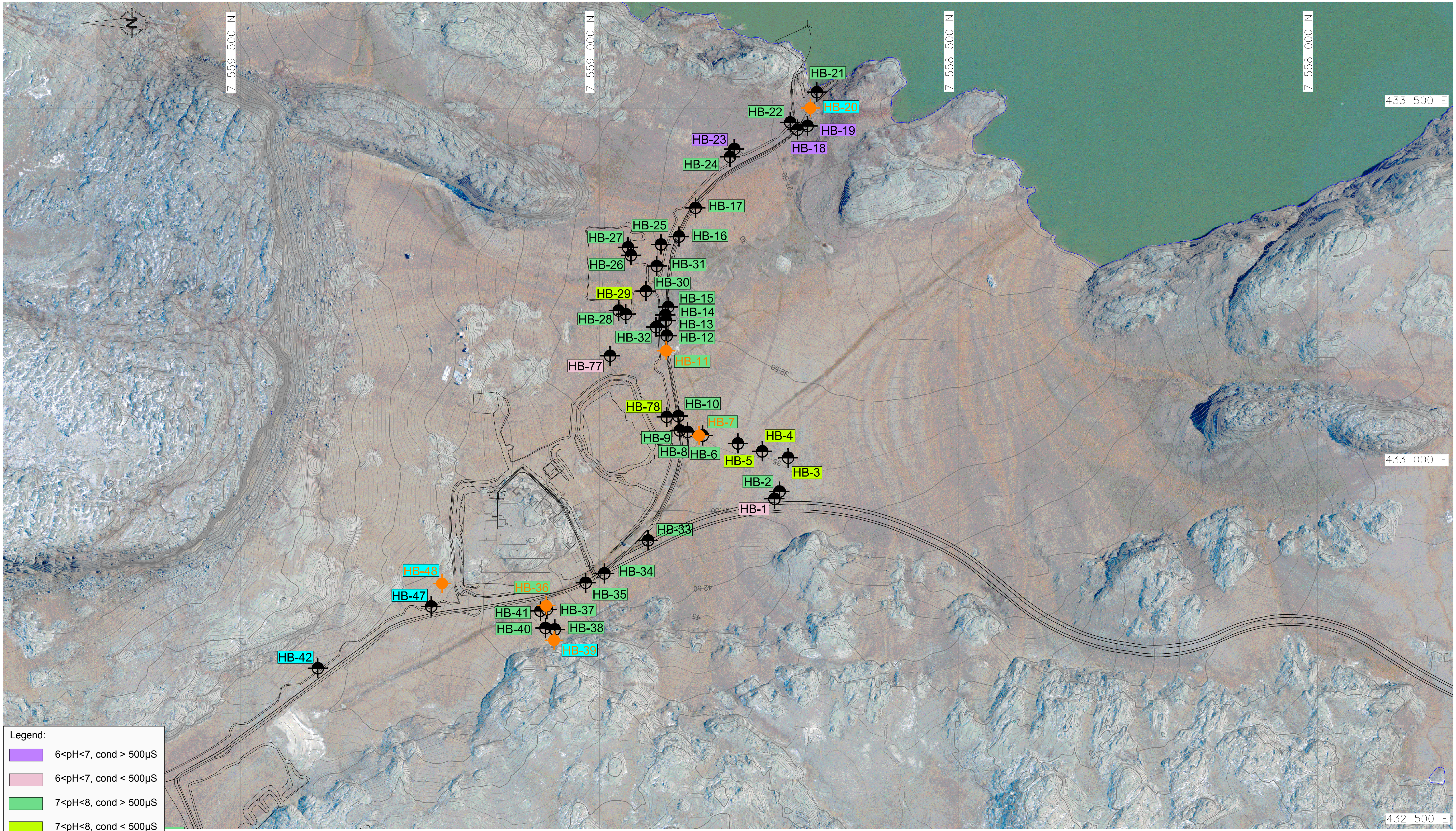

Legend:

- 6<pH<7, cond > 500µS
- 6<pH<7, cond < 500µS
- 7<pH<8, cond > 500µS
- 7<pH<8, cond < 500µS
- pH>8, cond > 500µS
- pH>8, cond < 500µS
- Sample Submitted for Chemical Analysis

1:5000 — 0 100 200 300 Meters

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SRK Consulting Engineers and Scientists Vancouver B.C.	HOPE BAY MINING LTD.	Quarry Rock Seepage Monitoring
		Seep Survey Locations Doris Camp
SRK JOB NO.: 1CH008.023.0001	Hope Bay Gold Project	DATE: Jan. 2011
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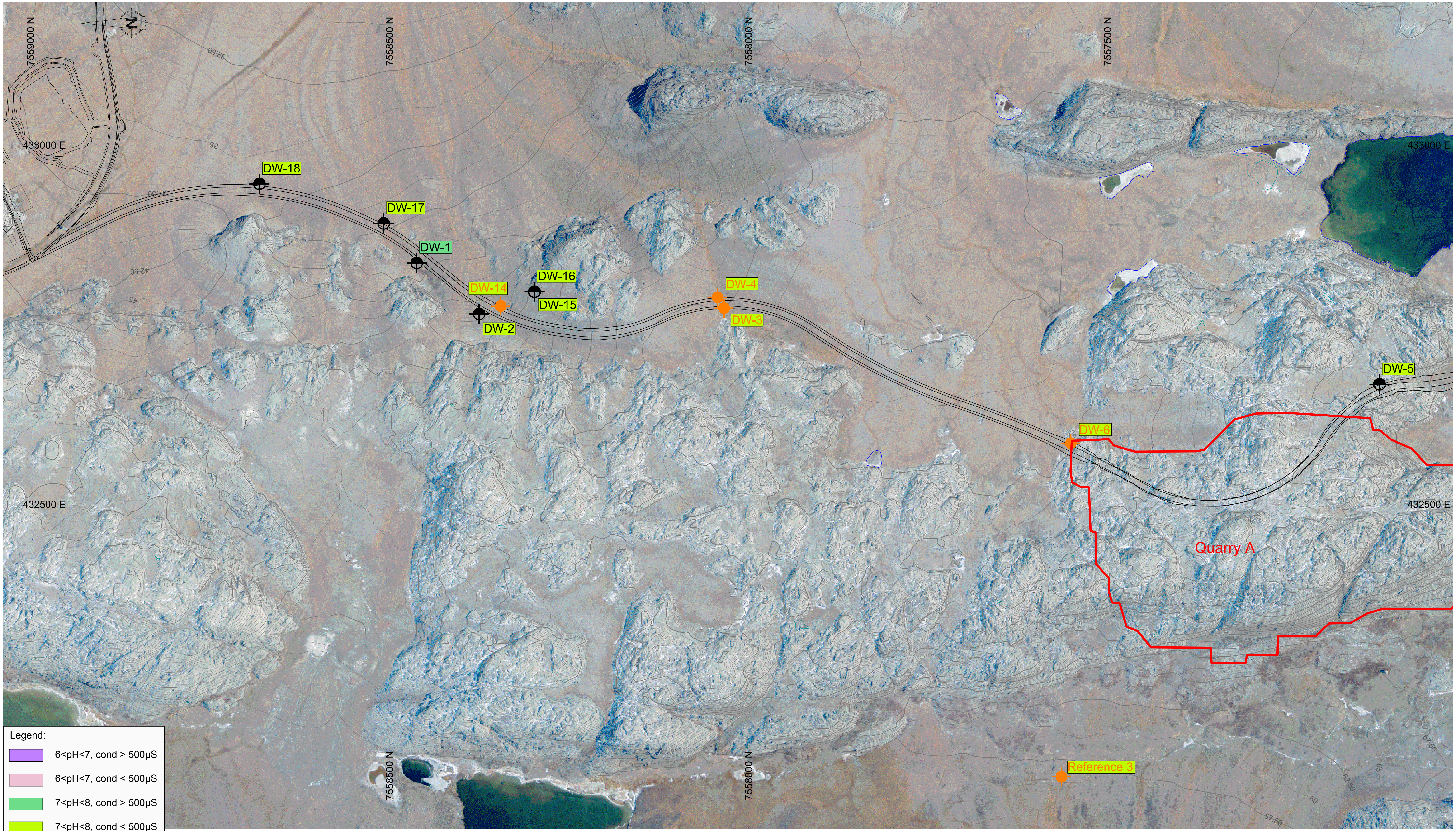
		FIGURE: 3



1:5000 — 0, 100, 200, 300 Meters

SRK Consulting, Engineers and Scientists, Vancouver B.C.	HOPE BAY MINING LTD.	Quarry Rock Seepage Monitoring
SRK JOB NO.: 1CH008.023.0001		Seep Survey Locations Doris-Windy Road
FILE NAME: DorisWindy Seeps LA.dwg	Hope Bay Gold Project	DATE: Jan. 2011 · APPROVED: CJ · FIGURE: 4

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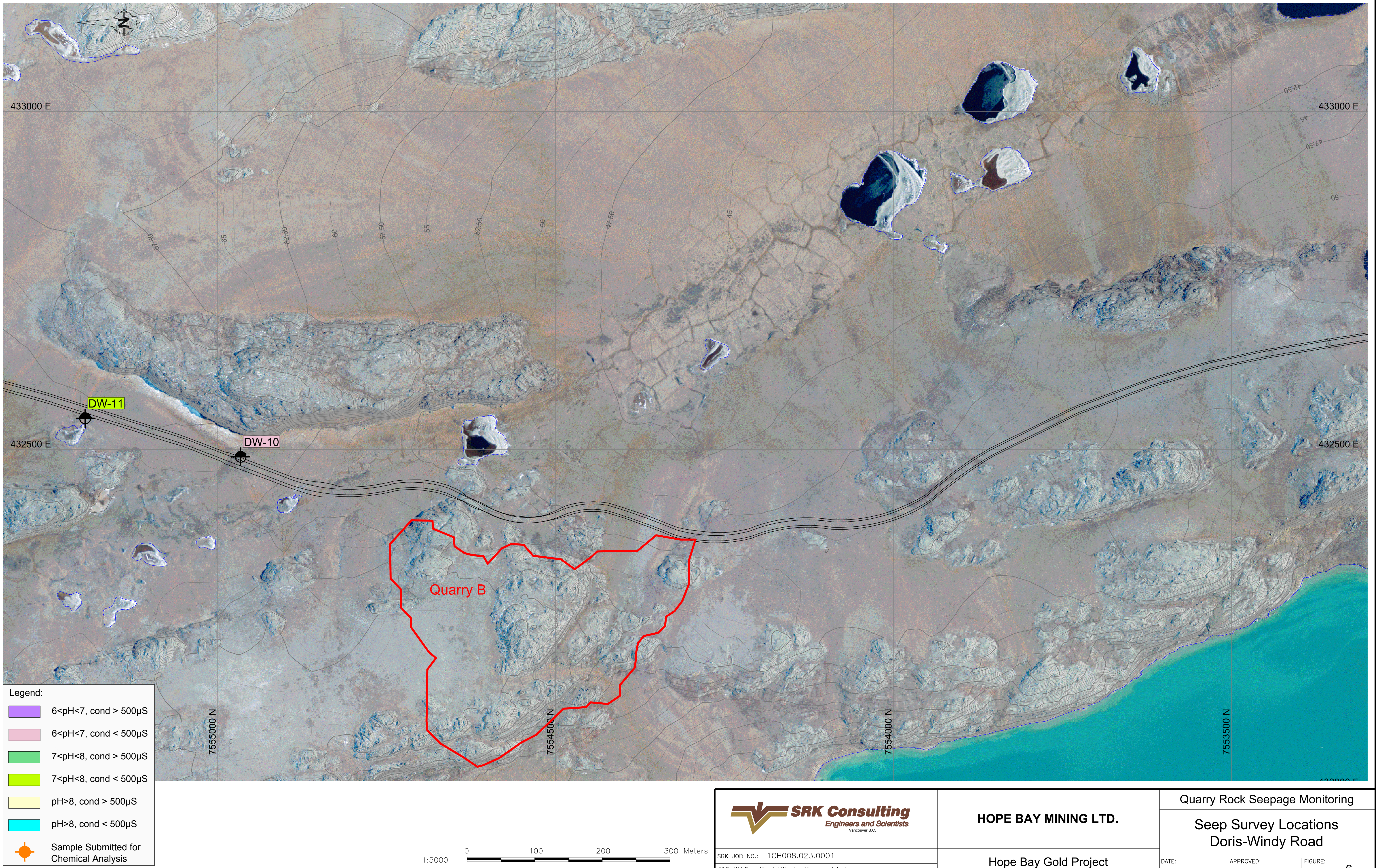
SRK Consulting Engineers and Scientists Vancouver B.C.	HOPE BAY MINING LTD.	Quarry Rock Seepage Monitoring
SRK JOB NO.: 1CH008.023.0001		Seep Survey Locations Doris-Windy Road
FILE NAME: DorisWindy Seeps LA.dwg	Hope Bay Gold Project	DATE: Jan. 2011 APPROVED: CJ FIGURE: 5



1:5000 0 100 200 300 Meters

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Vancouver B.C.

SRK JOB NO.: 1CH008.023.0001

FILE NAME: DorisWindy Seeps LA.dwg

HOPE BAY MINING LTD.

Hope Bay Gold Project

Quarry Rock Seepage Monitoring

Seep Survey Locations
Doris-Windy Road

DATE:	APPROVED:	FIGURE:
Jan. 2011	CJ	6

1:5000
0 100 200 300 Meters

SRK Consulting
Engineers and Scientists
Vancouver B.C.

SRK JOB NO.: 1CH008.023.0001

FILE NAME: DorisWindy Seeps LA.dwg

HOPE BAY MINING LTD.

Hope Bay Gold Project

Quarry Rock Seepage Monitoring

Seep Survey Locations
Doris-Windy Road

DATE: Jan. 2011
APPROVED: CJ
FIGURE: 7

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1:5000 — 0 100 200 300 Meters

SRK Consulting
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Vancouver B.C.

SRK JOB NO.: 1CH008.023.0001

FILE NAME: DorisWindy Seeps LA.dwg

HOPE BAY MINING LTD.

Hope Bay Gold Project

Quarry Rock Seepage Monitoring

Seep Survey Locations
Doris-Windy Road

DATE:	APPROVED:	FIGURE:
Jan. 2011	CJ	8

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Appendices

Appendix A:
Hope Bay Field Notes

Appendix A
Seepage Station Field Log

Sample ID	Location	Easting	Northing	Sampler	Sampling Date	Sampling Time	Field pH	Field Cond (µS)	Temp (^{o}C)	Flow	Sampled	Notes
HB - 1	Helipad	432957	7558756	C. James	18-Jun-10	3:20 PM	6.98	492	-	standing pool		
HB - 2	Helipad	432967	7558749	C. James	18-Jun-10	3:25 PM	7.02	812	-	standing pool		
HB - 3	Helipad	433014	7558737	C. James	18-Jun-10	3:26 PM	7.19	426	-	standing pool		
HB - 4	Helipad	433023	7558773	C. James	18-Jun-10	3:30 PM	7.73	199.9	2.8	trace flow		
HB - 5	Helipad	433034	7558807	C. James	18-Jun-10	3:35 PM	7.51	289	4.8	standing pool		
HB - 6	Helipad	433045	7558856	C. James	18-Jun-10	3:40 PM	7.49	570	2.9	trace flow		
HB - 7	Helipad	433045	7558861	C. James	18-Jun-10	3:45 PM	7.63	644	1.4	1	X	
HB - 8	Helipad	433050	7558877	C. James	18-Jun-10	4:00 PM	7.82	909	10.3	trace flow		distinct flow path; water orange colour; algae in bed
HB - 9	Helipad	433052	7558888	C. James	18-Jun-10	4:05 PM	7.83	832	4.3	trace flow		
HB - 10	Doris N Rd - Doris Lake	433072	7558890	C. James	18-Jun-10	4:08 PM	7.57	925	5.9	trace flow		
HB - 11	Doris N Rd - Doris Lake	433163	7558907	C. James	18-Jun-10	4:10 PM	7.78	1444	5.2	0.25	X	
HB - 12	Doris N Rd - Doris Lake	433184	7558906	C. James	18-Jun-10	4:30 PM	7.44	1177	8.6	standing pool		
HB - 13	Doris N Rd - Doris Lake	433205	7558907	C. James	18-Jun-10	4:30 PM	7.63	1174	8.3	0.1		Flow immediately upstream of culvert and converges with culvert
HB - 14	Doris N Rd - Doris Lake	433213	7558908	C. James	18-Jun-10	4:30 PM	7.74	910	7.1	1		Disseminated flow over approximatley 1m.
HB - 15	Doris N Rd - Doris Lake	433224	7558904	C. James	18-Jun-10	4:38 PM	7.89	1021	6.3	0.5		
HB - 16	Doris N Rd - Doris Lake	433322	7558889	C. James	18-Jun-10	4:45 PM	7.74	830	4	0.3		
HB - 17	Doris N Rd - Doris Lake	433362	7558866	C. James	18-Jun-10	4:50 PM	7.65	870	2.8	trace flow		
HB - 18	Doris N Rd - Doris Lake	433471	7558724	C. James	18-Jun-10	4:55 PM	6.97	558	3.3	1		
HB - 19	Doris Lake pad	433476	7558710	C. James	19-Jun-10	9:08 AM	6.89	5850	3.7	trace flow		
HB - 20	Doris Lake pad	433501	7558706	C. James	19-Jun-10	9:15 AM	8.12	330	3.2	0.5	X	Pump house basin overflowing directly u/s of sample location
HB - 21	Doris Lake pad	433523	7558697	C. James	19-Jun-10	9:34 AM	7.71	938	4.8	2		Flow beside small culvert and through rock.
HB - 22	Doris Lake pad	433481	7558734	C. James	19-Jun-10	9:42 AM	7.15	5890	4.2	trace flow		
HB - 23	Doris N Rd - Doris Lake	433444	7558812	C. James	19-Jun-10	9:51 AM	6.92	8690	2.8	1		
HB - 24	Doris N Rd - Doris Lake	433433	7558818	C. James	19-Jun-10	9:52 AM	7.04	6060	4.2	no visible flow		Directly on opposite (upstream) side of pad from HB - 23.
HB - 25	Old Helipad	433311	7558914	C. James	19-Jun-10	9:57 AM	7.66	920	4.7	trace flow		Trace flow towards road.
HB - 26	Old Helipad	433296	7558956	C. James	19-Jun-10	10:05 AM	7.69	738	3.8	trace flow		
HB - 27	Old Helipad	433307	7558960	C. James	19-Jun-10	10:11 AM	7.73	721	2.4	trace flow		
HB - 28	Old Helipad	433219	7558973	C. James	19-Jun-10	10:26 AM	7.54	661	4.7	trace flow		
HB - 29	Old Helipad	433214	7558963	C. James	19-Jun-10	10:29 AM	7.50	354	5.2	0.2		Flow alongside and into pad.
HB - 30	Old Helipad	433246	7558935	C. James	19-Jun-10	10:29 AM	7.34	1290	3.3	trace flow		
HB - 31	Doris N Rd - Doris Lake	433281	7558920	C. James	19-Jun-10	10:42 AM	7.23	1407	5.1	no visible flow		Large standing pool.
HB - 32	Doris N Rd - Doris Lake	433196	7558921	C. James	19-Jun-10	10:46 AM	7.61	1050	4.9	no visible flow		Large standing pool.
HB - 33	Doris N Rd	432899	7558932	C. James	19-Jun-10	11:30 AM	7.81	553	9.3	0.5		
HB - 34	Doris N Rd	432853	7558993	C. James	19-Jun-10	11:39 AM	7.66	1531	6.2	trace flow		Silt fence downstream - maybe sign of higher flows at this
HB - 35	Camp Area	432840	7559019	C. James	19-Jun-10	11:42 AM	7.57	1645	6.5	trace flow		
HB - 36	Road Spur across from Camp Area	432808	7559074	C. James	19-Jun-10	11:48 AM	**7.63**	1877	5.9	0.3	X	
HB - 37	Road Spur across from Camp Area	432803	7559073	C. James	19-Jun-10	12:57 PM	**7.84**	1866	9.8	0.2		
HB - 38	Road Spur across from Camp Area	432775	7559062	C. James	19-Jun-10	12:58 PM	7.94	946	7.9	0.2		
HB - 39	Road Spur across from Camp Area	432760	7559063	C. James	19-Jun-10	1:01 PM	**8.1**	68.1	4.2		X	Murky water; 2 filters used; downstream of new spur of road.
HB - 40	Road Spur across from Camp Area	432777	7559075	C. James	19-Jun-10	1:19 PM	**7.81**	763	10.9	trace flow		Trace flow into road spur.
HB - 41	Road Spur across from Camp Area	432801	7559082	C. James	19-Jun-10	1:20 PM	7.62	1862	10.7	0.5		In the track on tundra.
HB - 42	Doris N Rd	432721	7559392	C. James	19-Jun-10	1:35 PM	**8.01**	344	7.6	trace flow		Very dust affected.
HB - 43	Doris N Rd	432542	7559738	C. James	19-Jun-10	1:55 PM	**8.14**	195	9.6	0.5	X	Very dust affected; across from crusher pile; large ponded water
HB - 44	Doris N Rd	432585	7560045	C. James	19-Jun-10	2:20 PM	**7.81**	273	8.7	trace flow	X	Very dust affected.
HB - 45	Airstrip	432689	7560449	C. James	19-Jun-10	2:45 PM	**7.71**	189.6	10.6	0.5	X	Very dust affected.
HB - 46	Doris N Rd	432752	7560769	C. James	19-Jun-10	3:10 PM	**7.35**	173	7.4	0.1		Water disturbed prior to sampling.
HB - 47	Doris N Rd	432807	7559234	C. James	19-Jun-10	4:30 PM	8.10	270	7.8	0.2		
HB - 48	Camp Area	432839	7559219	C. James	19-Jun-10	4:50 PM	8.46	215	7.2		X	
HB - 49	Doris N Rd - between airstrips	432762	7560812	C. James	20-Jun-10	9:30 PM	**7.28**	188.1	10.9	0.3		seep from road
HB - 50	Doris N Rd - between airstrips	432766	7560824	C. James	20-Jun-10	9:37 AM	**7.45**	240	6.2	0.2		one photo taken with HB - 49 page
HB - 51	Doris N Rd - between airstrips	432815	7561036	C. James	20-Jun-10	9:50 AM	**6.67**	228	5.4	1		highly dust affected; flow from junction of road spans main road
HB - 52	Doris N Rd - between airstrips	432827	7561113	C. James	20-Jun-10	9:55 AM	**7.53**	248	5.8	0.5		dust affected flow from road

Sample ID	Location	Easting	Northing	Sampler	Sampling Date	Sampling Time	Field pH	Field Cond (µS)	Temp (°C)	Flow	Sampled	Notes
HB - 53	Doris N Rd - between airstrips	432867	7561324	C. James	20-Jun-10	10:08 AM	8.25	242	9.4	1		flow into airstrip very dust affected; flow off tundra cummulated and going under road
HB - 54	Airstrip	432906	7561535	C. James	20-Jun-10	10:12 AM	**7.01**	265	6.9	1		flow from under airstrip; very dust affected
HB - 55	Airstrip	433056	7562228	C. James	20-Jun-10		**6.99**	214	3	5	X	flow all along airstrip b/w two aprons. Tribs joining and flowing over dev. Rock in stream going in and out of toe of airstrip; at small pad flow widens and slows; very dust affected
HB - 56	N of airstrip	433148	7562228	C. James	20-Jun-10	11:26 AM	**7.16**	196.9	2.6	trace flow		N of airstrip; dry area; trace flow from road; very dust affected
HB - 57	Doris N Rd - Robert's Bay	433149	7562869	C. James	20-Jun-10	11:34 AM	**7.12**	274	4.1	0.1		flow from road
HB - 58	Doris N Rd - Robert's Bay	433096	7563023	C. James	20-Jun-10	11:41 AM	9.20	671	6	0.1	X	flow from road; very dust affected
HB - 59	Robert's Bay Pad	433043	7563176	C. James	20-Jun-10	12:00 PM	**7.46**	671	4.3	0.5		layer of dust deposited on rocks in stream bed
HB - 60	Robert's Bay Pad	432860	7563243	C. James	20-Jun-10	1:15 PM	**7.37**	674	6.4	0.1		
HB - 61	Robert's Bay Pad	432848	7563239	C. James	20-Jun-10	1:17 PM	**7.61**	506	2.7	0.2		very dust affected; layer of dust on rocks in stream bed
HB - 62	Robert's Bay Pad	432533	7563180	C. James	20-Jun-10	1:30 PM	**7.33**	292	6.8	0.2	X	no dust affects observed
HB - 63	Robert's Bay Pad	4325519	7563166	C. James	20-Jun-10	1:50 PM	**7.54**	152.5	10.7			
HB - 64	Doris N Rd - Robert's Bay	433098	7562955	C. James	21-Jun-10	11:00 AM	7.50	134.6	9.4	0.1		checked meters before returning to measure
HB - 64	Doris N Rd - Robert's Bay	433098	7562955	C. James	22-Jun-10	4:15 PM	7.79	177.6	8.1		X	
HB - 65	Doris N Rd - between airstrips	432688	7560528	C. James	20-Jun-10	3:30 PM	7.55	180.3	7.3	0.2		less dusty on this side of road
HB - 66	Doris N Rd - between airstrips	432713	7560676	C. James	20-Jun-10	3:38 PM	7.29	184.1	7.3	0.5	X	flow from W side of road
HB - 67	Doris N Rd - between airstrips	432730	7560726	C. James	20-Jun-10	3:48 PM	7.22	176.3	9.1	0.5		flow goes under road from tundra
HB - 68	Doris N Rd - between airstrips	432734	7560776	C. James	20-Jun-10		7.52	215	6.9	0.3		flow goes under road; orange staining on rocks
HB - 69	Doris N Rd - between airstrips	432757	7560861	C. James	20-Jun-10	3:55 PM	7.81	234	6.3	trace flow		flow from under road; some dust on stream surface
HB - 70	Doris N Rd - between airstrips	432774	7560942	C. James	20-Jun-10	4:00 PM	7.67	165.1	7.1	0.2		flows from under road
HB - 71	Doris N Rd - between airstrips	432856	7561367	C. James	20-Jun-10	4:10 PM	**7.7**	170.8	9.2	0.1		flow from under road and from tundra (?)
HB - 72	Airstrip	432858	7561588	C. James	20-Jun-10	4:18 PM	**7.72**	276	8.7	0.1		flow from under airstrip; oil and grease on water surface
HB - 73	Airstrip	432860	7561617	C. James	20-Jun-10	4:27 PM	**7.54**	154	10.2	3		flows from under airstrip in multiple locations, total 3 L/s; dust covering stream bed rocks; red stain rocks
HB - 74	Airstrip	433029	7562231	C. James	20-Jun-10	4:49 PM	**7.96**	224	8.5	5	X	flow from under airstrip in multiple locations; sample taken opposite from HB - 55
HB - 75	Doris N Rd - Robert's Bay	433136	7562685	C. James	21-Jun-10	11:15 AM	7.70	147.4	4.6	0.1		flow from road; sand convered rocks
HB - 76	Doris N Rd - Robert's Bay	433132	7562671	C. James	21-Jun-10	11:25 AM	7.70	132.6	3.3	0.2		flow from under pull out
HB - 77	around camp pad	433156	7558985	C. James	22-Jun-10	10:10 AM	6.65	358	6.8	0.2		flow off tundra contacts rocks and flows back onto tundra
HB - 78	around camp	433071	7558906	C. James	22-Jun-10	10:16 AM	7.41	188.6	3.9			seep from new rock placed on pad
HB - 79	New Pad Area	432514	7560124	C. James	22-Jun-10	11:05 AM	7.35	332	7.7	0.2		flow from tundra under new pad
HB - 80	New Pad Area	432477	7559503	C. James	22-Jun-10	11:20 AM	7.58	521	6.2	0.3		flow from pad in front of Q2
HB - 81	New Pad Area	432465	7560044	C. James	22-Jun-10	12:00 PM	8.09	468	1.9	trace flow	X	flow from new pad
HB - 82	New Pad Area	432465	7559926	C. James	22-Jun-10	12:13 PM	7.92	557	4.3	0.1		flow from under new pad

Sample ID	Location	Easting	Northing	Sampler	Sampling Date	Sampling Time	Field pH	Field Cond (µS)	Temp (^oC)	Flow	Sampled	Notes
HB - 83	New Pad Area	432436	7559633	C. James	22-Jun-10	12:20 PM	7.84	394	3.9	0.5		flow from cursher area
HB - 84	New Pad Area	432476	7559569	C. James	22-Jun-10	12:30 PM	7.32	5040	3	1		flow through culvert; d/s of drilling waste
DW - 1	Doris-Windy Rd - Camp Area	432844	7558470	C. James	21-Jun-10	1:20 PM	7.51	514	10.6	0.1		flow from under road
DW - 2	Doris-Windy Rd - Camp Area	432773	7558383	C. James	21-Jun-10	1:10 PM	7.64	87.4	7.3	0.3		flow off tundra into toad
DW - 3	Doris-Windy Rd - Camp Area	432781	7558042	C. James	21-Jun-10	1:25 PM	7.54	132.1	6.4	-	X	flow off tundra towards road; wide flow path through heaven veg
DW - 4	Doris-Windy Rd - Camp Area	432796	7558051	C. James	22-Jun-10	5:10 PM	7.74	164.8	8	0.1	X	flow from road
DW - 5	Doris-Windy Rd - Camp Area	432675	7557129	C. James	21-Jun-10	4:40 PM	7.57	181.7	11.7	trace flow		flow over tundra into rock
DW - 6	Doris-Windy Rd - Camp Area	432593	7557559	C. James	22-Jun-10	5:00 PM	7.70	250	5	0.1	X	flow out of rock across form Quarry
DW - 7	End of Doris-Windy Rd at time of moni	433234	7550825	C. James	23-Jun-10	11:40 AM	7.21	737	4.2	trace flow		
DW - 8	End of Doris-Windy Rd at time of moni	433223	7550855	C. James	23-Jun-10	11:53 AM	7.20	603	6.6	0.1		
DW - 9	Doris-Windy Rd	432718	7553042	C. James	23-Jun-10	1:30 PM	6.90	44.3	6.1	trace flow		trace flow not visible; into road off tundra
DW - 10	Doris-Windy Rd	432489	7554966	C. James	23-Jun-10	2:53 PM	6.90	71.2	12.8	0.2		flows from snow melt into road
DW - 11	Doris-Windy Rd	432546	7555196	C. James	23-Jun-10	3:00 PM	7.23	65	2.7	trace flow		trace flow from road
DW - 12	Doris-Windy Rd	432615	7555417	C. James	23-Jun-10	3:12 PM	7.32	83.1	7.9	0.5	X	Field blank processed here.
DW - 13	Doris-Windy Rd	432647	7555462	C. James	23-Jun-10	3:35 PM	7.83	155.1	5	0.2		flow from road
DW - 14	Doris-Windy Rd - Camp Area	432784	7558353	C. James	23-Jun-10	4:30 PM	7.89	178.1	4.1	0.3	X	flow from road
DW - 15	Doris-Windy Rd - Camp Area	432794	7558375	C. James	23-Jun-10	4:38 PM	7.57	220	6.3	trace flow		flow from lower portion of road;
DW - 16	Doris-Windy Rd - Camp Area	432804	7558306	C. James	23-Jun-10	4:42 PM	7.62	96.4	7.9	1		multiple flows from under road
DW - 17	Doris-Windy Rd - Camp Area	432899	7558516	C. James	23-Jun-10	4:48 PM	7.98	105.8	6.2	0.8		multiple flows from road
DW - 18	Doris-Windy Rd - Camp Area	432954	7558689	C. James	23-Jun-10		7.66	115.9	9.6	0.1		large pond; flow from road
Reference 1	Sourth of Doris-Windy Rd	433414	7550282	C. James	24-Jun-10	10:10 AM	6.32	66.5	11.1	2	X	flow from S of DW road
Reference 2	Doris-Windy Rd	432466	7555922	C. James	24-Jun-10	10:30 AM	6.45	45.2	12.7	trace flow	X	
Reference 3	Doris-Windy Rd - Camp Area	432129	7557572	C. James	24-Jun-10	10:50 AM	6.92	104.7	12.8	0.3	X	flow over tundra

* Bolded pH values were re-taken due to dust interference in original measurement. See text for discussion.

Appendix B:
Seep Survey Results

	Sample ID	Location	Sampling Date	ALS Sample ID	Field pH	pH	Hardness	Alkalinity	Ammonia	Nitrate	SO_4	dissolved Al	dissolved Sb	dissolved As	dissolved Ba
					s.u.	s.u.	mg $CaCO_3$/L	$CaCO_3$/L	mg N/L	mg N/L	mg/L	mg/L	mg/L	mg/L	mg/L
Samples with field pH > 8.0	HB - 20	Doris Lake pad	19-Jun-10	L902973-3	8.12	7.65	106	22.5	0.040	0.0541	2.25	0.0100	<0.00010	<0.0004	0.00823
	HB - 39	Road Spur across from Camp Area	19-Jun-10	L902973-5	8.1	8.02	35.9	36.0	<0.010	0.0198	<0.5	0.0186	<0.00010	0.00013	0.00256
	HB - 43	Doris N Rd	19-Jun-10	L902973-7	8.14	8.09	36.2	87.8	0.011	0.0138	<5.0	0.0157	<0.00010	0.00121	0.00284
	HB - 48	Camp Area	19-Jun-10	L902973-12	8.46	7.97	88.2	82.7	0.012	0.0679	<5.0	0.0167	<0.00010	0.00036	0.00402
	HB - 58	Doris N Rd - Robert's Bay	20-Jun-10	L901997-10	9.2	7.23	71.9	78.2	0.023	0.156	5.89	0.0152	<0.00010	0.00016	0.00305
	HB - 81	New Pad Area	22-Jun-10	L901997-8	8.09	7.93	179	155	0.320	0.691	12.5	0.0123	<0.00010	0.00031	0.0102
Additional Seepage Samples	HB - 7	Helipad	18-Jun-10	L902973-1	7.63	8.01	188	93.7	0.200	1.06	35.0	0.0061	<0.00010	<0.0006	0.00919
	HB - 11	Doris N Rd - Doris Lake	18-Jun-10	L902973-2	7.78	8.02	318	126	0.713	4.70	117	0.0068	<0.00020	<0.0022	0.0122
	HB - 36	Road Spur across from Camp Area	19-Jun-10	L902973-4	7.63	8.00	488	125	0.239	3.63	149	0.0041	<0.00020	<0.0014	0.0313
	HB - 44	Doris N Rd	19-Jun-10	L902973-8	7.81	7.99	148	124	0.140	0.0310	0.50	0.0092	<0.00010	0.00080	0.00692
	HB - 45	Airstrip	19-Jun-10	L902973-9	7.71	7.30	78.7	75.8	0.018	<0.0050	<5.0	0.0266	<0.00010	0.00028	0.00613
	HB - 55	Airstrip	20-Jun-10	L901997-1	6.99	8.21	93.8	85.9	0.016	0.418	3.19	0.0103	<0.00010	0.00074	0.00383
	HB - 62	Robert's Bay Pad	20-Jun-10	L901997-2	7.33	8.25	105	103	0.059	0.774	6.70	0.0113	<0.00010	0.00034	0.00393
	HB - 64	Doris N Rd - Robert's Bay	22-Jun-10	L901997-9	7.79	6.66	35.6	32.1	<0.010	0.0135	4.49	0.0564	<0.00010	0.00013	0.00294
	HB - 66	Doris N Rd - between airstrips	20-Jun-10	L901997-3	7.29	8.10	67.0	69.6	0.015	0.0206	2.37	0.0178	<0.00010	0.00017	0.00303
	HB - 74	Airstrip	20-Jun-10	L901997-4	7.96	8.26	97.2	89.9	0.025	0.373	3.30	0.0103	<0.00010	0.00061	0.00379
	DW - 3	Doris-Windy Rd - Camp Area	21-Jun-10	L901997-5	7.96	8.05	59.4	55.6	<0.010	<0.0050	2.59	0.0070	<0.00010	0.00012	0.00222
	DW - 4	Doris-Windy Rd - Camp Area	22-Jun-10	L901997-6	7.54	8.14	72.1	66.4	<0.010	0.0971	3.96	0.0093	<0.00010	0.00020	0.00560
	DW - 6	Doris-Windy Rd - Camp Area	22-Jun-10	L901997-7	7.7	8.04	86.0	68.6	0.081	2.90	6.09	0.0134	<0.00010	0.00018	0.00247
	DW - 12	Doris-Windy Rd	23-Jun-10	L902967-1	7.32	7.74	50.8	44.8	0.0493	0.149	<5.0	0.0323	<0.00010	0.00015	0.00341
	DW - 14	Doris-Windy Rd - Camp Area	23-Jun-10	L902967-2	7.89	7.99	77.2	66.7	0.0063	0.136	0.87	0.0050	<0.00010	0.00013	0.00321
Reference Points	Reference 1	Sourth of Doris-Windy Rd	24-Jun-10	L902967-5	6.32	7.52	30.1	23.4	0.0051	<0.0050	<5.0	0.0528	<0.00010	0.00018	0.00251
	Reference 2	Doris-Windy Rd	24-Jun-10	L902967-6	6.45	7.23	22.5	21.1	0.0397	<0.0050	<0.5	0.0222	<0.00010	<0.0001	0.00237
	Reference 3	Doris-Windy Rd - Camp Area	24-Jun-10	L902967-7	6.92	7.66	36.3	36.2	0.0075	<0.0050	<0.5	0.0508	<0.00010	0.00016	0.00338

	Sample ID	dissolved Be	dissolved Bi	dissolved B	dissolved Cd	dissolved Ca	dissolved Cr	dissolved Co	dissolved Cu	dissolved Fe	dissolved Pb	dissolved Li	dissolved Mg	dissolved Mn	dissolved Mo	dissolved Ni	dissolved P
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Samples with field pH > 8.0	HB - 20	<0.00050	<0.00050	<0.01	<0.00005	33.2	<0.00050	<0.00010	0.00089	0.032	<0.000050	<0.0050	5.57	0.0189	0.000114	<0.00050	<0.30
	HB - 39	<0.00050	<0.00050	<0.01	<0.00005	12.6	<0.00050	<0.00010	0.00133	<0.030	<0.000050	<0.0050	1.07	0.00697	0.000058	<0.00050	<0.30
	HB - 43	<0.00050	<0.00050	0.014	<0.00005	10.2	<0.00050	0.00010	0.00513	0.115	<0.000050	<0.0050	2.59	0.0181	0.000084	0.00093	<0.30
	HB - 48	<0.00050	<0.00050	0.019	<0.00005	26.3	<0.00050	<0.00010	0.00537	<0.030	<0.000050	<0.0050	5.50	0.00180	0.000193	0.00114	<0.30
	HB - 58	<0.00050	<0.00050	<0.010	<0.000050	19.6	0.00061	<0.00010	0.00263	<0.030	<0.000050	<0.0050	5.57	0.00346	0.000135	0.00051	<0.30
	HB - 81	<0.00050	<0.00050	0.022	<0.000050	53.4	0.00091	0.00033	0.00451	0.055	<0.000050	<0.0050	11.2	0.00886	0.000190	0.00160	<0.30
Additional Seepage Samples	HB - 7	<0.00050	<0.00050	0.018	<0.00005	60.0	<0.00050	0.00025	0.00241	0.053	<0.000050	<0.0050	9.28	0.0331	0.000295	0.00072	<0.30
	HB - 11	<0.0010	<0.0010	0.074	<0.0001	79.0	<0.001	0.00074	0.00635	<0.030	<0.0001	<0.0100	29.3	0.0621	0.00128	0.0027	<0.30
	HB - 36	<0.0010	<0.0010	<0.02	<0.0001	148	<0.001	0.00080	0.00106	0.094	<0.0001	<0.0100	28.8	0.176	0.00022	0.0011	<0.30
	HB - 44	<0.00050	<0.00050	<0.01	<0.00005	42.4	<0.002	<0.00010	0.00306	0.036	<0.000050	<0.0050	10.3	0.0189	0.000222	0.00100	<0.30
	HB - 45	<0.00050	<0.00050	0.020	<0.00005	23.1	<0.00050	0.00015	0.00443	0.088	<0.000050	<0.0050	5.09	0.0389	0.000330	0.00202	<0.30
	HB - 55	<0.00050	<0.00050	<0.010	<0.000050	29.2	<0.00050	<0.00010	0.00276	<0.030	<0.000050	<0.0050	5.07	0.00509	0.000199	0.00145	<0.30
	HB - 62	<0.00050	<0.00050	0.024	<0.000050	28.0	<0.00050	0.00011	0.00414	<0.030	<0.000050	<0.0050	8.44	0.0104	0.000333	0.00126	<0.30
	HB - 64	<0.00050	<0.00050	<0.010	<0.000050	7.34	0.00055	<0.00010	0.00300	0.030	<0.000050	<0.0050	4.21	0.00212	0.000070	0.00066	<0.30
	HB - 66	<0.00050	<0.00050	0.012	<0.000050	17.7	0.00085	0.00011	0.00252	0.082	<0.000050	<0.0050	5.53	0.0100	0.000145	0.00191	<0.30
	HB - 74	<0.00050	<0.00050	<0.010	<0.000050	30.6	0.00085	<0.00010	0.00360	0.050	<0.000050	<0.0050	5.04	0.00300	0.000204	0.00181	<0.30
	DW - 3	<0.00050	<0.00050	<0.010	<0.000050	19.1	<0.00050	<0.00010	0.00332	<0.030	<0.000050	<0.0050	2.84	0.000258	0.000050	0.00087	<0.30
	DW - 4	<0.00050	<0.00050	<0.010	<0.000050	23.5	<0.00050	<0.00010	0.00380	0.035	<0.000050	<0.0050	3.24	0.0119	0.000065	0.00110	<0.30
	DW - 6	<0.00050	<0.00050	0.010	<0.000050	29.5	<0.00050	0.00019	0.00681	<0.030	<0.000050	<0.0050	3.02	0.000445	0.000151	<0.00050	<0.30
	DW - 12	<0.00050	<0.00050	<0.010	<0.00005	15.5	0.00053	0.00011	0.00232	0.050	<0.000050	<0.0050	2.97	0.0186	0.000076	0.00197	<0.30
	DW - 14	<0.00050	<0.00050	0.012	<0.00005	26.5	<0.00050	<0.00010	0.00158	<0.030	<0.000050	<0.0050	2.69	0.00117	0.000072	<0.00050	<0.30
Reference Points	Reference 1	<0.00050	<0.00050	<0.010	<0.00005	5.98	0.00055	<0.00010	0.00116	0.149	<0.000050	<0.0050	3.68	0.000774	0.000191	0.00246	<0.30
	Reference 2	<0.00050	<0.00050	<0.010	<0.00005	6.22	<0.00050	<0.00010	0.00098	0.191	<0.000050	<0.0050	1.70	0.000937	<0.000050	0.00055	<0.30
	Reference 3	<0.00050	<0.00050	<0.010	<0.00005	10.3	<0.00050	<0.00010	0.00171	0.122	<0.000050	<0.0050	2.58	0.00471	<0.000050	0.00060	<0.30

	Sample ID	dissolved K	dissolved Se	dissolved Si	dissolved Ag	dissolved Na	dissolved Sr	dissolved Tl	dissolved Sn	dissolved Ti	dissolved U	dissolved V	dissolved Zn
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Samples with field pH > 8.0	HB - 20	<2.0	<0.0010	0.563	<0.000010	14.0	0.0834	<0.00010	<0.00010	<0.010	0.000021	<0.0010	<0.0010
	HB - 39	<2.0	<0.0010	0.434	<0.000010	2.0	0.0137	<0.00010	<0.00010	<0.010	0.000022	<0.0010	<0.0010
	HB - 43	<2.0	<0.0010	1.69	<0.000010	9.0	0.0233	<0.00010	<0.00010	<0.010	0.000044	<0.0010	<0.0010
	HB - 48	<2.0	<0.0010	2.73	<0.000010	18.4	0.0991	<0.00010	<0.00010	<0.010	0.000026	<0.0010	<0.0010
	HB - 58	<2.0	<0.0010	1.11	<0.000010	21.7	0.0358	<0.00010	<0.00010	<0.010	0.000018	<0.0010	<0.0010
	HB - 81	2.9	<0.0010	2.82	<0.000010	20.6	0.0931	<0.00010	<0.00010	<0.010	0.000200	<0.0010	<0.0010
Additional Seepage Samples	HB - 7	2.5	<0.0020	1.90	<0.000010	47.7	0.152	<0.00010	<0.00010	<0.010	0.000179	<0.0010	<0.0010
	HB - 11	8.4	<0.0040	2.36	<0.000020	170	0.236	<0.00020	<0.00020	<0.010	0.000601	<0.0020	<0.0020
	HB - 36	6.9	<0.0040	2.04	<0.000020	187	0.520	<0.00020	<0.00020	<0.010	0.000242	<0.0020	<0.0020
	HB - 44	<2.0	<0.0010	2.68	<0.000010	20.8	0.0639	<0.00010	<0.00010	<0.010	0.000033	<0.0010	<0.0010
	HB - 45	<2.0	<0.0010	1.93	<0.000010	13.1	0.0462	<0.00010	<0.00010	<0.010	0.000020	<0.0010	0.0018
	HB - 55	<2.0	<0.0010	0.613	<0.000010	10.0	0.0375	<0.00010	<0.00010	<0.010	0.000042	<0.0010	<0.0010
	HB - 62	<2.0	<0.0010	1.95	<0.000010	19.1	0.0419	<0.00010	<0.00010	<0.010	0.000110	<0.0010	<0.0010
	HB - 64	<2.0	<0.0010	1.38	<0.000010	13.8	0.0224	<0.00010	<0.00010	<0.010	0.000015	<0.0010	<0.0010
	HB - 66	<2.0	<0.0010	1.89	<0.000010	12.9	0.0521	<0.00010	<0.00010	<0.010	0.000025	<0.0010	0.0011
	HB - 74	<2.0	<0.0010	0.652	<0.000010	9.9	0.0369	<0.00010	<0.00010	<0.010	0.000053	<0.0010	<0.0010
	DW - 3	<2.0	<0.0010	1.43	<0.000010	3.4	0.0176	<0.00010	<0.00010	<0.010	0.000010	<0.0010	0.0016
	DW - 4	<2.0	<0.0010	1.51	<0.000010	5.5	0.0226	<0.00010	<0.00010	<0.010	0.000043	<0.0010	0.0012
	DW - 6	<2.0	<0.0010	0.768	<0.000010	6.5	0.0172	<0.00010	<0.00010	<0.010	0.000187	<0.0010	<0.0010
	DW - 12	<2.0	<0.0010	2.39	<0.000010	4.6	0.0220	<0.00010	<0.00010	<0.010	0.000015	<0.0010	0.0020
	DW - 14	<2.0	<0.0010	1.82	<0.000010	11.9	0.0370	<0.00010	<0.00010	<0.010	0.000019	<0.0010	<0.0010
Reference Points	Reference 1	<2.0	<0.0010	1.78	<0.000010	4.0	0.0127	<0.00010	<0.00010	<0.010	0.000022	<0.0010	0.0042
	Reference 2	<2.0	<0.0010	1.01	<0.000010	2.3	0.00972	<0.00010	<0.00010	<0.010	<0.000010	<0.0010	0.0013
	Reference 3	<2.0	<0.0010	1.68	<0.000010	8.9	0.0164	<0.00010	<0.00010	<0.010	0.000013	<0.0010	<0.0010