Magma Metals Limited
Thunder Bay North Polymetallic Project
Ontario, Canada
NI 43-101 Technical Report on Preliminary Assessment

Prepared for:
Magma Metals Limited

Prepared by:
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Project No. 164115

Effective Date: 17 March 2011

CERTIFICATE OF QUALIFIED PERSON

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I, David G. Thomas, P.Geo., am employed as a Principal Geologist with AMEC Americas Ltd.

This certificate applies to the technical report entitled “Magma Metals Limited, Thunder Bay North Polymetallic Project, Ontario, Canada, NI 43-101 Technical Report on Preliminary Assessment” (the “Technical Report”), dated 17 March 2011.

I am a Professional Geologist registered in British Columbia (P.Geo NRL # 149114) and a member of the Australasian Institute of Mining and Metallurgy (MAusIMM # 225250). I graduated in 1993 from Durham University, in the United Kingdom with a Bachelor of Science degree and in 1995 from Imperial College, University of London, in the United Kingdom with a Master of Science degree.

I have practiced my profession for over 15 years. In that time I have been directly involved in review of exploration, geological models, exploration data, sampling, sample preparation, quality assurance-quality control, databases, and mineral resource estimates for a variety of mineral deposits.

As a result of my experience and qualifications, I am a Qualified Person as defined in National Instrument 43–101 Standards of Disclosure for Mineral Projects (NI 43–101).

I have not visited the Thunder Bay Polymetallic Project (the “Project”).

I am responsible for Sections 6, 7, 8, 9, 10, 11, 12, 13, 14 and 17 of the Technical Report, and those portions of the Summary, Conclusions and Recommendations that pertain to that section.

I am independent of Magma Metals Limited as independence is described by Section 1.4 of NI 43–101.

I have previously been a co-author of a technical report on the Project, entitled:

> Kulla, G., Thomas, D.G., Gormely, L, Eggleston, T., and Searston, S., 2010: Magma Metals Limited, Thunder Bay North Polymetallic Project, Ontario, Canada, NI 43-101 Technical Report: unpublished technical report prepared by AMEC Americas Ltd for Magma Metals Ltd, effective date 6 October 2010

I have read NI 43–101 and this report has been prepared in compliance with that Instrument.

As of the date of this certificate, to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

“Signed and sealed”

David G. Thomas P.Geo

Dated: 23 March 2011

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This certificate applies to the technical report entitled "Magma Metals Limited, Thunder Bay North Polymetallic Project, Ontario, Canada, NI 43-101 Technical Report on Preliminary Assessment" (the "Technical Report"), dated 17 March 2011.

I am a Professional Engineer in the province of British Columbia (P.Eng #25975). I graduated from the Montana Tech of the University of Montana with a Bachelor of Mining Engineering degree in 1988, and from the British Columbia Institute of Technology with a Diploma in Mining Technology in 1984.

I have practiced my profession for 22 years. I have been directly involved in open pit mining operations, and design of open pit mining operations in Indonesia, Canada, the United States, Chile, Peru and Mexico.

As a result of my experience and qualifications, I am a Qualified Person as defined in National Instrument 43–101 Standards of Disclosure for Mineral Projects (NI 43–101).

I have not visited the Thunder Bay North Polymetallic Project (the "Project").

I am responsible for Section 19 of the Technical Report and those portions of the Summary, Conclusions and Recommendations that pertain to that section.

I am independent of Magma Metals Limited as independence is described by Section 1.4 of NI 43–101.

I have been involved with the Thunder Bay North Polymetallic Project since August 2010, during preparation of a Preliminary Assessment and this Technical Report.

I have read NI 43–101 and this report has been prepared in compliance with that Instrument.

As of the date of this certificate, to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

"Signed and sealed"

Jay Melnyk, P.Eng.

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I, Lynton Gormely, Ph.D., P.Eng., am employed as a Principal Process Engineer with AMEC Americas Ltd.

This certificate applies to the technical report entitled “Magma Metals Limited, Thunder Bay North Polymetallic Project, Ontario, Canada, NI 43-101 Technical Report on Preliminary Assessment” (the “Technical Report”), dated 17 March 2011.

I am a member of the Association of Professional Engineers and Geoscientists of British Columbia, registration number 10005. I graduated from the University of British Columbia with a Bachelor of Applied Science degree in 1968, and from the University of British Columbia with a Ph.D. in Chemical Engineering in 1973.

I have practiced my profession for 39 years. My experience includes SX-EW recovery of copper, cobalt, and nickel; nickel, copper and gold pressure oxidation; and a variety of innovative process investigations on projects located in North and South America, South Africa, Australia, Mongolia and the Asia-Pacific region.

As a result of my experience and qualifications, I am a Qualified Person as defined in National Instrument 43–101 Standards of Disclosure for Mineral Projects (NI 43–101).

I have not visited the Thunder Bay North Polymetallic Project (the “Project”).

I am responsible for Section 16 and those portions of the Recommendations, Summary and Conclusions that are based on that section of the Technical Report.

I am independent of Magma Metals Limited as independence is described by Section 1.4 of NI 43–101.

I have previously been a co-author of a technical report on the Project, entitled:

> Kulla, G., Thomas, D.G., Gormely, L, Eggleston, T., and Searston, S., 2010: Magma Metals Limited, Thunder Bay North Polymetallic Project, Ontario, Canada, NI 43-101 Technical Report: unpublished technical report prepared by AMEC Americas Ltd for Magma Metals Ltd, effective date 6 October 2010

I have read NI 43–101 and this report has been prepared in compliance with that Instrument.

As of the date of this certificate, to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

“Signed and sealed”

Dr. Lynton Gormely. P.Eng.

Dated: 23 March 2011

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I, Stella Searston, MAusIMM, M.AIG am employed as a Principal Geologist with AMEC E&C Services Inc.

This certificate applies to the technical report entitled Magma Metals Limited, Thunder Bay North Polymetallic Project, Ontario, Canada, NI 43-101 Technical Report on Preliminary Assessment" (the "Technical Report"), dated 17 March 2011.

I am member of the Australasian Institute of Mining and Metallurgy (#111778) and a member of the Australian Institute of Geoscientists (#2406). I graduated from James Cook University, Australia, in 1987 with a Bachelor of Science degree and from the University of Tasmania, Australia in 1999 with a Master of Economic Geology degree.

I have practiced professionally for 23 years. In that time I have been directly involved in exploration for and review of, geological, mineralization, exploration and drilling data, geological models, sampling, sample preparation, assaying and other resource-estimation related analyses, quality assurance-quality control databases, and resource estimates, in Australia, Southern Africa, the Pacific and North America.

As a result of my experience and qualifications, I am a Qualified Person as defined in National Instrument 43–101 Standards of Disclosure for Mineral Projects (NI 43–101).

I have not visited the Thunder Bay North Polymetallic Project (the "Project").

I am responsible for Sections 1, 2, 3, 4, 5, 15, 18, 20, 21, 22 and 23 of the Technical Report.

I am independent of Magma Metals Limited as independence is described by Section 1.4 of NI 43–101.

I have previously been a co-author of a technical report on the Project, entitled:

> Kulla, G., Thomas, D.G., Gormely, L, Eggleston, T., and Searston, S., 2010: Magma Metals Limited, Thunder Bay North Polymetallic Project, Ontario, Canada, NI 43-101 Technical Report: unpublished technical report prepared by AMEC Americas Ltd for Magma Metals Ltd, effective date 6 October 2010

I have read NI 43–101 and this report has been prepared in compliance with that Instrument.

As of the date of this certificate, to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

“Signed”

Stella Searston, MAusIMM, MAIG.

Dated: 23 March 2011

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I, Gregory Kenneth Kulla, P.Geo., am employed as a Principal Geologist with AMEC Americas Ltd.

This certificate applies to the technical report entitled "Magma Metals Limited, Thunder Bay North Polymetallic Project, Ontario, Canada, NI 43-101 Technical Report on Preliminary Assessment" (the "Technical Report"), dated 17 March 2011.

I am a member of the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC, member #23492), and of the Association of Professional Geoscientists of Ontario (APOG #1752). I graduated from the University of British Columbia with a Bachelor of Science in Geology degree in 1988.

I have practiced my profession continuously since 1988 and have been involved in precious and base metal disseminated sulphide deposit assessments in Canada, United States, Australia, Mexico, Chile, Peru and India.

As a result of my experience and qualifications, I am a Qualified Person as defined in National Instrument 43–101 Standards of Disclosure for Mineral Projects (NI 43–101).

I visited the Thunder Bay Polymetallic Project from 23 to 27 November, 2009.

I am responsible for the preparation of Section 14.1, and those portions of the Summary, Conclusions and Recommendations that pertain to that section.

I am independent of Magma Metals Limited as independence is described by Section 1.4 of NI 43–101.

I have previously been a co-author of a technical report on the Project, entitled:

> Kulla, G., Thomas, D.G., Gormely, L, Eggleston, T., and Searston, S., 2010: Magma Metals Limited, Thunder Bay North Polymetallic Project, Ontario, Canada, NI 43-101 Technical Report: unpublished technical report prepared by AMEC Americas Ltd for Magma Metals Ltd, effective date 6 October 2010

I have read NI 43-101, and this report has been prepared in compliance with that Instrument.

As of the date of this certificate, to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

“signed and sealed”

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23 March 2011

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IMPORTANT NOTICE

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1.0 SUMMARY

AMEC Americas Limited (AMEC) was commissioned by Magma Metals Limited (Magma Metals) to prepare an independent Qualified Person's Review and a National Instrument 43-101 Technical Report (the Report) for the Thunder Bay North polymetallic project (the Project), located in the Thunder Bay area of Ontario, Canada. The Project is held in the name of Magma Metals (Canada) Limited, a wholly-owned subsidiary of Magma Metals. For the purposes of this Report, the parent and subsidiary companies are referred to interchangeably as "Magma Metals".

Magma Metals will be using this Report in support of a press release dated 7 February 2011, entitled "Positive Scoping Study for Thunder Bay North Project: Considerable upside potential to further enhance the economics of the project".

1.1 Principal Outcomes

- An open pit Mineral Resource estimate of 8.46 Mt at 2.13g/t PtEq of Indicated Mineral Resources, and 0.053 Mt at 2.00g/t PtEq of Inferred Mineral Resources
- An underground Mineral Resource estimate of 1.03 Mt at 3.48 g/t PtEq of Indicated Mineral Resources, and additional 0.2 Mt grading 3 g/t PtEq of Inferred Mineral Resources
- The conceptual mine plan was developed using only open pit methods. Mining would be at a rate of 1.5 Mt/a over a seven-year mine life
- The conceptual process design uses Platsol™ technology to produce precious metals in a powder form, copper metal and nickel/cobalt alloy
- Operating costs over the life-of-mine total C$41.73/t milled
- Total life-of mine capital costs estimated at C$207 M
- Pre-tax cumulative cash flow is C$164.4 M with an IRR of 12.8%. The cash flow analysis shows that the Project will generate a positive cash flow in all years except Year 1 on a pre-tax basis
- The annual positive cash flow results in a payback period of approximately 4.6 years
- At an 8% discount rate, the net present value (NPV) of the project is C$40.75 M.

1.2 Location and Access

The Thunder Bay Project is situated approximately 50 km northeast of the city of Thunder Bay, within the Thunder Bay Mining Division, Ontario, Canada.

The property is accessible using a series of logging roads branching from Armstrong Highway 527, which in turn branches from the Trans-Canada Highway 11-17 a short distance east of the city of Thunder Bay. The Escape Lake and Shallownest East logging roads are intermittently maintained by local logging contractors; however, the remaining access roads, to and within, the Project are regularly maintained, in both winter and summer, by Magma Metals. A new access road from Highway 527 (Armstrong Highway), 11 km west of the site, is planned to be constructed as the main site access road.

The closest commercial airport is at Thunder Bay.

1.3 Mineral Tenure, Surface Rights, and Royalties

The Project consists of 219 original, unpatented, mining claims (2,551 claim units of 16 ha) covering an aggregate area of 40,816 ha. The mineral resources estimated for the Beaver Lake, Bridge and Current Lake Zones are situated within claims 842189, 842186, and 4210157. Magma Metals owns 100% of all claims within the Project, except four claims, totalling 30 units (480 ha), covered by two underlying option agreements. None of the claims have been legally surveyed; this is not a requirement under Ontario legislation.

Mineral claims are located on Crown lands, and therefore surface rights are acquired as part of the claim process.

A group of 32 claims is subject to a 3% net smelter royalty (NSR), one-third of which can be purchased by Magma Metals at any time for C$1 million. These claims include claims 842189 and 842186 that host part of the mineral resource estimate.

1.4 Permits

Magma Metals has informed AMEC that work completed to date has been under the appropriate local, Provincial and Federal laws required for exploration-level activities. Additional permits would be required to support any Project development.

1.5 Environmental

Magma Metals has informed AMEC that current project environmental liabilities are restricted to exploration site activities and access trails constructed to service exploration programs.

Magma Metals contracted DST Consulting Engineers (DST) in November 2007 to commence environmental baseline studies in the vicinity of the Current and Escape Lake drainage areas to determine current environmental conditions and monitor levels prior to any potential disturbance from advanced exploration or possible mining operations. In 2009, monitoring was extended to include the areas of Steepledge Lake, Ray Lake, Lone Island Lake, and Fitzpatrick Lake.

Exploration activities have been appropriately permitted. Additional permits would be required to support any Project development.

1.6 Geology and Mineralization

Mineralization discovered on the Project to date is considered to be typical of magmatic-hosted nickel–copper sulphide deposits, in particular part of the sub-class of such deposits that are associated with rift and flood basalts (Noril'sk type).

The mineralization is hosted in the Current Lake Intrusive Complex. Rock types within the intrusive complex comprise a leucogabbro–diorite rock that incorporated large quantities of country rock, termed the "Hybrid", olivine melagabbro, and lherzolite (two-pyroxene peridotite). Surrounding Archean-age country types are granodiorite and tonalite with minor amounts of granite and pegmatitic leucogranite, and meta-sedimentary rocks.

The Current Lake Zone is a narrow conduit ranging from 30 m x 30 m to 50 m wide and 70 m tall and in general is flat-lying. The olivine melagabbro in the conduit contains sulphide mineralization that consists of pyrrhotite, pentlandite, chalcopyrite, pyrite, and rare cubanite and violarite. Sulphide mineralization is disseminated, ranging from a few percent to >25% sulphides, and is interstitial to the silicate gangue.

The Beaver Lake Zone exhibits a shallow east–southeasterly plunge and increases from 100 m width and 15 m thickness to 550 m width and 200 m thickness towards the east. Mineralization is developed in olivine melagabbro and lherzolite. The sulphide mineralogy is similar to Current Lake and consists of pyrrhotite, pentlandite, chalcopyrite, pyrite and rare cubanite. Sulphide mineralization is disseminated, ranging from a few percent to >25% sulphides.

The Bridge Zone, which joins the Current Lake and Beaver Lake Zones, is designated based on a morphology change within the magma conduit.

1.7 History and Exploration

Initial exploration in the general region was for uranium. In 1991, the Ontario Geological Survey completed airborne magnetic and electromagnetic geophysical surveys in the area and identified magnetic anomalies. In the period 1993 to 2005, rock chip sampling, prospecting, lithogeochemistry, soil sampling, ground magnetic surveys and petrographic and geochemical research were undertaken, culminating in the discovery by prospectors of mineralized ultramafic (peridotite) boulders along the western shoreline of Current Lake. During 2001, ground-magnetic and electromagnetic surveys and core drilling were completed by Pacific North West Capital Corporation, who held an option on the area. This option was not exercised.

Magma Metals optioned the Current Lake area in 2005. Since then, Magma Metals has completed airborne and ground geophysical surveys, reconnaissance activities, core drilling, mineral resource estimation and a preliminary assessment (PA).

1.8 Drilling

Drilling commenced late in 2006, and has continued to the present. All drilling has been completed using core methods, and, as at 17 March 2011, totalled 712 core holes (141,231.5 m). This drill total includes all reconnaissance, delineation, and infill drilling completed on the Project to 17 March, 2011. Of this total, 528 core holes (97,676 m) support the September 2010 mineral resource estimation. A further 115 drill holes (26,486.8 m) were drilled and three were extended (890 m) within the Project boundaries after the resource estimate database close-out date of 31 May 2010.

The lithologies encountered in this recent drilling confirmed the geological continuity as interpreted for the mineral resource estimate. However, the mineralization is locally more variable than predicted. AMEC considers that the current geological and grade interpretations are acceptable for mineral resources supporting PA-level studies. A reassessment of mineralization continuity, in particular of the higher grade shell used in the current resource estimate, is warranted for the next mineral resource update.

Drill programs have been completed by contract drill crew, supervised by Magma Metals geological staff. All drill holes have been geologically logged and record lithology, structure, mineralization minerals and intensity, alteration minerals and intensity, and veins.

Drill collars for land-based, barge-based, and ice-based drilling have been picked up on completion using geodetic-grade, global positioning system (GPS) instruments. Collars for those drill holes completed on land have also been surveyed by a licensed professional surveyor.

Down-hole orientations of all drill holes are surveyed using a Reflex EZ-Shot® instrument, which is a magnetic instrument. Since September 2007, the orientation of all inclined drill holes have also been surveyed by a Reflex Maxibor II® instrument, which is a non-magnetic multi-shot tool designed to be used in areas of magnetic rock. Since January 2010 all vertical and inclined holes have been surveyed by a Reflex Gyro® instrument.

Sample collection and handling of core was performed in accordance with industry standard practices, with procedures to limit sample losses and sampling biases. Core samples are taken on 2 m intervals in rocks that are considered to be non-mineralized. Mineralized intersections are sampled on 1 m intervals. Samples are submitted for analysis with quality assurance and quality control (QA/QC) samples inserted. These comprise blank, duplicate and standard reference materials (SRMs).

No factors were identified with the drilling programs that could affect Mineral Resource estimation.

1.9 Sample Preparation and Analysis

All analyses were performed by accredited independent laboratories.

Sample preparation protocols for all drill programs were appropriate for magmatic sulphide-style deposits, consisting of drying, crushing, splitting, and pulverization.

Gold, platinum and palladium are analysed using fire assay with an inductively coupled plasma mass spectrometry (ICP-MS) finish. Samples that have grades above the optimal ICP-MS detection limits are analysed using an optical emission spectroscopy method (ICP-OES). Multi-element and base metals are analyzed using a multi-element atomic emission spectroscopy (ICP-AES), following four-acid digest of the sample. Where samples have Ni or Cu grades above the optimal detection limits for the analytical method, they are re-analysed, using an ore-grade method.

The density database totals 4,494 measurements in mineralized material, and an additional 448 measurements in wall rock. Measurements were collected by Magma Metals staff using the standard water displacement method.

1.10 Data Validation

AMEC reviewed the collar, assay, and lithology data, and accepted that the data are adequate to support mineral resource estimation. AMEC noted some opportunities for improvements in all of these tables that should be addressed prior to completion of more detailed Project studies.

Discrepancies were noted with the down-hole survey data; most of the discrepancies will only result in location discrepancies of a few meters (<10 m), at most, but some discrepancies may be larger. As a result, AMEC believes that the data are useable, but will restrict mineral resource classification below about 100 m to the Inferred classification, at best, in the area of angled drill holes because of the uncertainty of the location of the information. The data should be investigated and corrected prior to undertaking a pre-feasibility study.

Analytical QA/QC data indicate that the assay data are sufficiently accurate and precise to support mineral resource estimation.

1.11 Metallurgical Testwork

Testwork completed and reported during the current study included mineralogy, comminution, concentration (principally flotation with some gravity and magnetic work), and concentrate chemical processing using pressure oxidation (Platsol™) technology. Testwork established an appropriate process route, likely reagent usage, and recovery factors.

Several methods were considered at the conceptual level for the recovery of revenue metals from the Platsol™ pregnant leach solution (PLS) within the constraint of keeping the hydrometallurgical operation simple and economical but providing upgraded products which would improve project revenue due to reduced impact of smelter deductions. The selected route involves PGM and copper recovery by cementation with nickel (cobalt) recovery by Electrometals® electrowinning (EMEW®).

The three-stage process selected as the preferred process route is as follows:

- Crushing, grinding and flotation to extract the sulphides from the ore to produce an initial bulk concentrate. A gravity circuit would extract a significant proportion of the gold, which is output to the bulk concentrate
- The bulk concentrate is then treated by Platsol™ pressure oxidation to produce a pregnant leach solution (PLS), which contains the dissolved metals

- The PLS is then treated via relatively simple and commercial process routes (reduction with metal (cementation) to produce both precious metals bullion and copper, followed by electrowinning of nickel and cobalt). It is noted, however, that no testwork has been done on Platsol™ PLS solution from Thunder Bay North concentrates to confirm performance of the options considered.

1.12 Mineral Resources

Two block models were created: one for the resource estimate for mineralization that was to be considered as able to support extraction via open pit methods, and one for the mineralization that was to be considered as able to support extraction via underground mining methods. The block models are regular block models without sub-blocks or percent models.

The original drill core samples were composited to 1 m standard length for outlier analysis and grade capping studies. The 1 m composites were subsequently composited to 2 m for exploratory data analysis, continuity analysis (variography) and interpolation.

Outlier grade restriction was achieved by means of grade caps and by limiting the search distance to a specified maximum for composites with grades above a selected threshold.

To account for a portion of the Ni and Co occurring as silicate minerals, Ni and Co in sulphide were estimated by linear regression of MgO to total Ni and total Co respectively. Densities were also estimated by linear regression.

Ordinary kriging (OK) was used as the estimator for Cu, MgO, Ni, Pd, and Pt. Inverse distance weighting to the first power (ID) was used for Ag, Au, Co, and S. A nearest-neighbour (NN) interpolated block model was used as a means of creating declustered statistics for block model estimation validation.

Estimates were verified by a combination of model volume checks, verification of global statistics, Herco and swath plots. No errors were noted with the estimations.

Classification of mineral resources was based on a combination of grade and geological continuity, and distances to the nearest drill hole. Reasonable prospects of economic extraction were applied by constraining classified blocks within an open pit shell or underground mining shapes. Cut-off grades were determined after consideration of appropriate economic, technical, and cost assumptions, for the cases of platinum revenue only, to be applied to a platinum grade-equivalent (PtEq). For the open pit scenario, a PtEq grade of 0.59 g/t was used, and for the underground scenario, the grade was 1.94 g/t PtEq.

Mineralization within the Thunder Bay North Project at the Current Lake, Bridge and Beaver Lake Zones that demonstrates grade and geological continuity, and is either constrained by an L–G pit shell that was based on reasonable extraction assumptions, or constrained within underground mineable shapes, is considered to be classified in accordance with the 2005 CIM Definition Standards for Mineral Resources and Mineral Reserves. Mineral Resources are also compliant with the Australasian Joint Ore Reserves Committee (JORC) 2004 Code, but have been reported using the CIM terminology.

Table 1-1 presents the Mineral Resources that can be mined using open pit methods; Table 1-2 presents the Mineral Resources that would be amenable to underground mining methods. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

1.13 Proposed Mine Plan

Initially AMEC studied two mining scenarios, a standalone open pit and a hybrid case with a smaller open pit mine and underground operation, utilising a drift-and-fill mining method. As the study progressed and the economic parameters became better defined, it became apparent that the stand alone open pit presented better economic results then the hybrid scenario. A throughput trade-off study was performed, comparing economics for throughputs of 1.0 Mt/a, 1.25 Mt/a and 1.5 Mt/a for the open pit only scenario. The 1.5 Mt/a case appeared most attractive, and was scheduled in more detail.

To prepare the resource model for mine planning, a metal equivalent grade item was prepared, followed by addition of a dilution skin surrounding the blocks above the marginal cut-off. The PtEq formula is:

PtEq g/t = Pt g/t + Pd g/t x 0.3204 + Au g/t x 0.6379 + Ag g/t x 0.0062 + Cu g/t x 0.00011 + Total Ni g/t x 0.000195 + Total Co g/t x 0.000124 + Rh g/t x 2.1816.

Three dilution skin thicknesses, ranging from 0.3 to 1.5 m, depending on location, were applied by assigning an ore percent and routing codes to all waste blocks contacting a mineralized block above the cut-off grade (0.69 g/t PtEq for 1.0 Mt/a, 0.63 g/t PtEq for 1.25 Mt/a and 0.59 g/t PtEq for 1.5 Mt/a). The effect of the dilution is a 17% increase in mill feed, and a 12% reduction in PtEq grade for the 1.5 Mt/a case.

Table 1-1: Open Pit Mineral Resource Statement, Thunder Bay North Project, Effective Date 11 January 2011, David Thomas, P.Geo.

Category	Quantity	Grade									Contained Metal								
	Tonnage (t x 1,000)	Pt (g/t)	Pd (g/t)	Rh (g/t)	Au (g/t)	Ag (g/t)	Cu (%)	Ni (%)	Co (g/t)	PtEq (g/t)	Pt (oz x 1,000)	Pd (oz x 1,000)	Rh (oz x 1,000)	Au (oz x 1,000)	Ag (oz x 1,000)	Cu (t x 1,000)	Ni (t x 1,000)	Co (t x 1,000)	PtEq (oz x 1,000)
Indicated	8,460	1.04	0.98	0.04	0.07	1.5	0.25	0.18	140	2.13	282	266	12	18	411	21	15	1	580
Inferred	53	0.96	0.89	0.04	0.07	1.6	0.22	0.18	142	2.00	2	2	—	—	3	—	—	—	3

Notes to accompany Open Pit Mineral Resource Table
1. The mineral resource categories under JORC Code (2004) are the same as the equivalent categories under CIM Definition Standards for Mineral Resources and Mineral Reserves (2010).
2. The portion of the Mineral Resource underlying Current Lake is assumed to be accessible and that necessary permission and permitting will be acquired.
3. Strip ratio (waste to ore) of 9:1.
4. The open pit Mineral Resource is reported at a cut-off grade of 0.59 g/t PtEq within a Lerchs-Grossman resource pit shell optimized on PtEq.
5. The contained metal figures shown are in situ.
6. No assurance can be given that the estimated quantities will be produced.
7. The platinum-equivalency formula is based on assumed metal prices and overall recoveries.
8. All figures have been rounded; summations within the tables may not agree due to rounding. Tonnages and contained metal values are rounded to the nearest 1,000 tonnes, grades are rounded to two decimal places;
9. Tonnage and grade measurements are in metric units. Contained ounces are reported as troy ounces

Table 1-2: Underground Mineral Resource Statement, Thunder Bay North Project, Effective Date 31 May 2010, David Thomas, P.Geo.

Category	Quantity	Grade									Contained Metal								
	Tonnage (t x 1,000)	Pt (g/t)	Pd (g/t)	Rh (g/t)	Au (g/t)	Ag (g/t)	Cu (%)	Ni (%)	Co (g/t)	PtEq (g/t)	Pt (oz x 1,000)	Pd (oz x 1,000)	Rh (oz x 1,000)	Au (oz x 1,000)	Ag (oz x 1,000)	Cu (t x 1,000)	Ni (t x 1,000)	Co (t x 1,000)	PtEq (oz x 1,000)
Indicated	1,030	1.63	1.51	0.08	0.11	2.4	0.39	0.24	172	3.48	54	50	2	4	80	4	3	—	115
Inferred	212	1.40	1.29	0.06	0.09	1.9	0.34	0.23	158	3.00	10	9	—	1	13	1	—	—	20

Notes to accompany Underground Mineral Resource Table
1. Mineral resources are reported to commodity prices of US$875/oz Au, US$14.30/oz Ag, US$13/lb Co, US$2.10/lb Cu, US$7.30/lb Ni, US$400/oz Pd, US$1,470/oz Pt and US$4,000/oz Rh;
2. Mineral resources are defined within mineable underground shapes;
3. Underground mineral resources are reported to a PtEq value of 1.94 g/t;
4. Tonnages and contained metal values are rounded to the nearest 1,000 tonnes, grades are rounded to two decimal places;
5. Rounding as required by reporting guidelines may result in apparent summation differences between tonnes, grade and contained metal content;
6. Tonnage and grade measurements are in metric units. Ounces are reported as troy ounces

The mine plan features approximately 9.7 Mt of indicated material at a grade of 1.9 g/t PtEq and 0.3 Mt of inferred material at a grade of 0.4 g/t PtEq being extracted over a seven-year mine life. The overall strip ratio would be approximately 8.3:1. The development direction would be from north to south, deferring the high-strip ratio Bridge Zone area toward the later years of the mine life. Contract mining is assumed due to the short life-of-mine (LOM) as well as the need for two sets of open pit mining equipment dictated by the Thunder Bay North deposit geometry and extent. The open pit operation employs a selective mining method due to the irregularity of the geometry and grade variability, and the need to minimize ore losses. A bulk mining approach is also employed in the regions with significant barren waste stripping requirements.

1.14 Waste Management

The development of the proposed open pit will generate 83 Mt of excavated overburden and blasted waste rock that will require storage. The current study assumes 60% of waste rock will be potentially acid-generating (PAG) with the remaining waste rock and overburden assumed to be non-PAG.

1.15 Tailings Management

Approximately 9.5 Mt of tailings may be produced during the seven-year life of the mine. The TMF is currently designed for a total storage capacity of 6.6 Mm^3 (9.1 Mt) with potential for additional raises and/or expansion to accommodate additional capacity as required. If no further mineralization is developed to justify additional raise(s) of the confining structures, a combination of central spigotting and grading could be used in the final year to develop a gently-sloped final tailing surface to facilitate reclamation, thereby accommodating the additional material.

1.16 Water Management

Average surface water flows into the proposed Current Lake open pit are estimated at 1,600 m^3/d ($\cong$ 18 L/s) with peak surface water inflows after storm events at least two orders of magnitude higher. These are based on Environment Canada data and preliminary plans to divert the upstream watershed of Current Lake.

To support the planned mining activities a cofferdam will be constructed at the Current Lake outlet and two small dams will be constructed at the Northeast Inlet and East Inlet. Two diversion channels are proposed on the east side of the lake to intercept water from the Northeast Inlet and East Inlet and direct it northward beyond the Current Lake Outlet Dam.

1.17 Cost Estimates

Capital cost estimates are summarized in Table 1-3. Operating cost estimates are summarized in Table 1-4.

Table 1-3: Life-of-Mine Capital Costs

Item	Cost Estimate
Pre-Production	C$174 million
Sustaining & Closure (including salvage)	C$32 million
Total Capital	C$207 million

Table 1-4: Life-of-Mine Operating Costs

Item	Cost Estimate
Open Pit Mining	C$1.78/t mined
	C$16.72/t milled
Site Processing	C$20.31/t milled
Transport, Refining & Royalty	C$2.03/t milled
Site General & Administration	C$2.67/t milled
Total Operating Costs	C$41.73/t milled

1.18 Markets

The primary revenue metals at Thunder Bay North are platinum, nickel, palladium and copper.

Market research performed on behalf of Magma Metals has indicated that there is a market for a bulk concentrate produced by Thunder Bay North and the likely payable metals would be Pt, Pd, Rh, Au, Ag, Cu, Co, and Ni. Research has also indicated that all of the high value products resulting from Platsol™ pressure oxidation and downstream processing would be highly marketable. Suitable refining facilities for the precious metal products were identified and offered reasonable indicative terms

1.19 Taxation

The Project is subject to Federal and Provincial taxes. The Federal Corporate Income Tax rate, as of 2012, will be 15%. The Ontario Provincial Tax rate will be 10%, effective July 12, 2013. Ontario mining operations are also subject to a provincial mining tax, levied at a rate of 10% on taxable profit in excess of $500,000.

1.20 Financial Analysis

The following section is partly based on Inferred Mineral Resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as Mineral Reserves, and there is no certainty that the preliminary assessment based on these Mineral Resources will be realized.

The results of the economic analyses discussed in this section represent forward-looking information as defined under Canadian securities law. The results depend on inputs that are subject to a number of known and unknown risks, uncertainties and other factors that may cause actual results to differ materially from those presented here.

Long-term average consensus prices were used for the Thunder Bay North financial model base case. These long-term prices were compiled from price forecasts from a number of respected financial institutions. The exchange rate used for this case was C$:$US 0.90.

The pre-tax cumulative cash flow for the base case financial analysis is C$164.4 M with an IRR of 12.8%. The cash flow analysis shows that the Project will generate a positive cash flow in all years except Year 1 on a pre-tax basis. The annual positive cash flow results in a payback period of approximately 4.6 years. At an 8% discount rate, the net present value (NPV) of the project is C$40.75 M.

Under an alternative financial case, where metal prices were the spot prices as at 21 January 2011, and the exchange rate was C$:$US 0.98, the pre-tax cumulative cash flow for the alternative case financial analysis is C$360 M with an IRR of 27%. At an 8% discount rate, the NPV of the Project would be C$164 M.

1.21 Conclusions

In the opinion of the QPs, the Project that is outlined in this Report has achieved its objectives in that a deposit that potentially could support mine development has been identified. The results of the PA indicate that additional drill testing and more detailed studies can be supported.

1.22 Recommendations

There is considerable upside potential to enhance the economics of the Thunder Bay North Project by increasing the Mineral Resource available for mining and/or reducing the capital and operating costs for mineral processing.

A two-phase program, consisting of exploration and optimization studies, is recommended for the Project, to support advancement of the Project to a more detailed study phase. The phases can be run concurrently, and are independent of each other.

Phase 1 comprises exploration drill programs, geophysical surveys, and geological research studies. This phase is estimated to cost about $7.95 M.

Phase 2 consists of review of the recommendations arising from the PA, and optimization studies. The optimization studies will assess ways of improving the overall economics of the Project. Once optimization is complete, the recommendations arising from the PA will be revisited and the future Project direction established. Costs are provided as a range for this work, as the estimate depends on whether work is performed by third-party consultants or by Magma Metals staff. Estimated total costs are approximately $2 M to $2.5 M.

2.0 INTRODUCTION

AMEC Americas Limited (AMEC) was commissioned by Magma Metals Limited (Magma Metals) to prepare an independent Qualified Person's Review and NI 43-101 Technical Report (the Report) for the Thunder Bay North polymetallic project (the Project), located in the Thunder Bay area of Ontario, Canada (Figure 2-1). The Project is held in the name of Magma Metals (Canada) Limited, a wholly-owned subsidiary of Magma Metals. For the purposes of this Report, the parent and subsidiary companies are referred to interchangeably as "Magma Metals".

The Report discloses the results of a Preliminary Assessment (PA) for the Project. Magma Metals will be using this Report in support of a press release dated 7 February 2011, entitled "Positive Scoping Study for Thunder Bay North Project: Considerable upside potential to further enhance the economics of the project".

All measurement units used in this Report are metric, and currency is expressed in US dollars unless stated otherwise. The Report uses Canadian English.

2.1 Qualified Persons

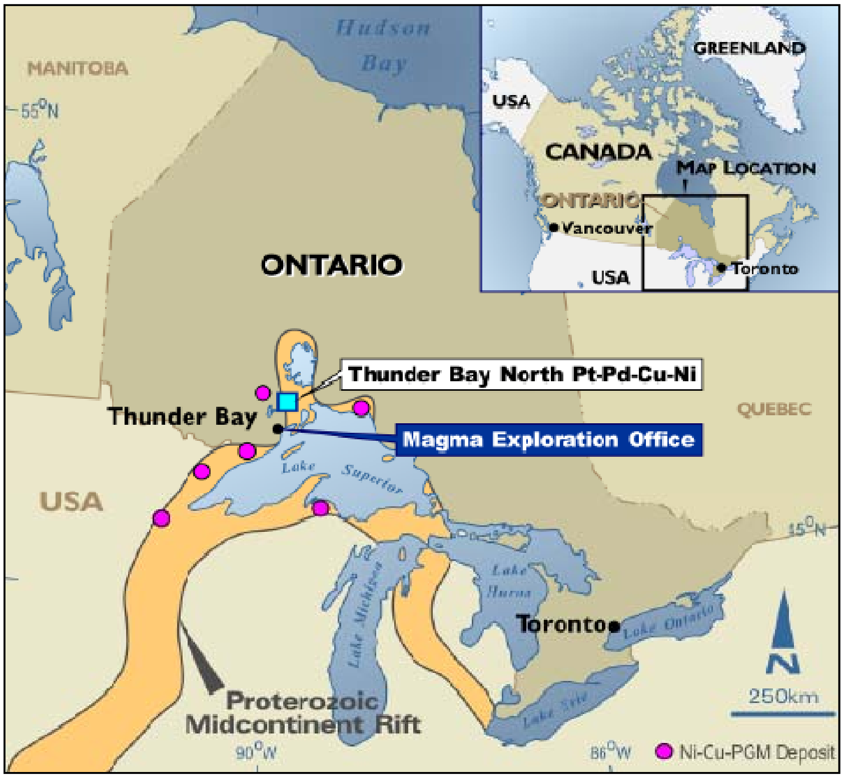
The following people served as the Qualified Persons (QPs) as defined in National Instrument 43-101, *Standards of Disclosure for Mineral Projects* (NI 43-101), and in compliance with Form 43-101F1. The QPs responsible for the preparation of the Report are:

- David Thomas, P.Geo., MAusIMM, Principal Geologist, AMEC Vancouver
- Jay Melnyk, P.Eng., Principal Engineer, AMEC Vancouver
- Dr. Lynton Gormely, P.Eng., Principal Process Engineer, AMEC Vancouver
- Stella Searston, M.AusIMM, Principal Geologist, AMEC Reno.
- Greg Kulla, P.Geo., Principal Geologist, AMEC Vancouver.

2.2 Site Visits

An AMEC QP conducted a site visit to the Project in November 2009 as shown in Table 2-1. During the site visit, the scope of the personal inspection by the AMEC QP comprised inspection of core and surface outcrops, drill platforms and sample cutting and logging areas; discussions of geology and mineralization with Magma Metals staff; reviewing geological interpretations with staff; and viewing of potential locations of major infrastructure.

Figure 2-1: Location Map



Note: Figure courtesy Magma Metals

Table 2-1: QPs, Areas of Report Responsibility, and Site Visits

Qualified Person	Site Visits	Report Sections of Responsibility (or Shared Responsibility)
David Thomas	No site visit	Sections 6, 7, 8, 9, 10, 11, 12, 13, 14, 17 and those portions of the Summary, Conclusions, and Recommendations that pertain to that section
Jay Melnyk	No site visit	Section 19, and those portions of the Summary, Conclusions, and Recommendations that pertain to that section
Lynton Gormely	No site visit	Section 16, and those portions of the Summary, Conclusions, and Recommendations that pertain to that section
Stella Searston	No site visit	Sections 1, 2, 3, 4, 5, 15, 18, 20, 21, 22, and 23
Greg Kulla	23 to 27 November 2009	Section 14.1 and those portions of the Summary, Conclusions, and Recommendations that pertain to that section

2.3 Effective Dates

There are a number of effective dates for information in the Report:

- Database close-off date: 31 May 2010
- Date of the underground Mineral Resource estimate: 31 May 2010
- Date of the open pit Mineral Resource estimate: 11 January 2011
- Date of the last supply of drill information: 17 March 2011
- Date of the last supply of metallurgical-related data: 31 January 2011
- Date of the completion of the financial analysis: 7 February 2011
- Date of the completion of the PA study: 7 February 2011.

The Report effective date is the date of the last update on drill information, and is 17 March 2011.

There has been no material change to scientific and technical information regarding the Project between the effective date of the Report, and the Report signature date.

2.4 Previous Technical Reports

Magma Metals has previously filed the following technical reports on the Project:

Kulla, G., Thomas, D.G., Gormely, L, Eggleston, T., and Searston, S., 2010: Magma Metals Limited, Thunder Bay North Polymetallic Project, Ontario, Canada, NI 43-101 Technical Report: unpublished technical report prepared by AMEC Americas Ltd for Magma Metals Ltd, effective date 6 October 2010

Cole, G., and El-Rassi, D., 2009: Mineral Resource Evaluation, Thunder Bay North Polymetallic, Project, Ontario, Canada: unpublished technical report prepared by SRK Consulting Ltd for Magma Metals Ltd, effective date 29 September, 2009.

These reports and the reports and documents listed in the Reference section of this report were used to support preparation of the Report.

2.5 Technical Report Sections and Required Items under NI 43-101

Table 2-2 relates the sections as shown in the contents page of this Report to the Prescribed Items Contents Page of NI 43-101. The main differences are that Item 25 "Additional Requirements for Technical Reports on Development Properties and

Production Properties" is incorporated into the main body of the Report, following Item 19, "Mineral Resource and Mineral Reserve Estimates".

Table 2-2: Contents Page Headings in Relation to NI 43-101 Prescribed Items—Contents

NI 43-101 Item Number	NI 43-101 Heading	Report Section Number	Report Section Heading
Item 1	Title Page		Cover page of Report
Item 2	Table of Contents		Table of contents
Item 3	Summary	Section 1	Summary
Item 4	Introduction	Section 2	Introduction
Item 5	Reliance on Other Experts	Section 3	Reliance on Other Experts
Item 6	Property Description and Location	Section 4	Property Description and Location
Item 7	Accessibility, Climate, Local Resources, Infrastructure and Physiography	Section 5	Accessibility, Climate, Local Resources, Infrastructure and Physiography
Item 8	History	Section 6	History
Item 9	Geological Setting	Section 7	Geological Setting
Item 10	Deposit Types	Section 8	Deposit Types
Item 11	Mineralization	Section 9	Mineralization
Item 12	Exploration	Section 10	Exploration
Item 13	Drilling	Section 11	Drilling
Item 14	Sampling Method and Approach	Section 12	Sampling Method and Approach
Item 15	Sample Preparation, Analyses and Security	Section 13	Sample Preparation, Analyses and Security
Item 16	Data Verification	Section 14	Data Verification
Item 17	Adjacent Properties	Section 15	Adjacent Properties
Item 18:	Mineral Processing and Metallurgical Testing	Section 16	Mineral Processing and Metallurgical Testing
Item 19	Mineral Resource and Mineral Reserve Estimates	Section 17	Mineral Resource and Mineral Reserve Estimates
Item 20	Other Relevant Data and Information	Section 19	Other Relevant Data and Information
Item 21	Interpretation and Conclusions	Section 20	Interpretation and Conclusions
Item 22	Recommendations	Section 21	Recommendations
Item 23	References	Section 22	References
Item 24	Date and Signature Page	Section 23	Date and Signature Page
Item 25	Additional Requirements for Technical Reports on Development Properties and Production Properties	Section 18	Additional Requirements for Technical Reports on Development Properties and Production Properties
Item 26	Illustrations		Incorporated in Report under appropriate section number

3.0 RELIANCE ON OTHER EXPERTS

The QPs, authors of this Report, state that they are qualified persons for those areas as identified in the "Certificate of Qualified Person" attached to this Report. The authors have relied on, and believe there is a reasonable basis for this reliance, upon the following reports, which provided information regarding mineral rights, surface rights, and environmental status in sections of this Report as noted below.

3.1 Tenure

The QPs have fully relied upon and disclaim responsibility for information relating to the mineral tenure status for the Project through the following legal opinions prepared for Magma Metals:

- Magma Metals (Canada) Limited, 2010: Certificate of an Officer of Magma Metals (Canada) Limited: confidential letter prepared by Magma Metals for Sheldon Huxtable Professional Corporation, 19 October 2010
- Sheldon Huxtable Professional Corporation, 2010a: Unpatented Claims of Magma Metals (Canada) Limited: confidential letter prepared by Sheldon Huxtable Professional Corporation for Magma Metals, 19 October 2010
- Sheldon Huxtable Professional Corporation, 2010b: Additional Information Regarding Unpatented Claims Of Magma Metals (Canada) Limited: confidential memorandum prepared by Sheldon Huxtable Professional Corporation for Magma Metals, 19 October 2010
- Sheldon Huxtable Professional Corporation, 2010c: Schedules of Claims 30 September 2010: Excel spreadsheet of claim status as at 30 September, prepared by Sheldon Huxtable Professional Corporation for Magma Metals, 15 October 2010.

This information is used in Section 4.3 and Section 4.6 of the Report, and in Appendix A.

The QPs have fully relied upon and disclaim responsibility for information relating to the mineral tenure status for the Project through the following opinion prepared by Magma Metals:

- Magma Metals (Canada) Limited, 2010: Mineral Claims Table as at 6 October 2010: email from Allan MacTavish, Exploration Manager, Magma Metals, to AMEC, dated 15 October 2010

This information is used in Appendix A.

3.2 Surface Rights

The QPs have fully relied upon and disclaim responsibility for information relating to the surface rights status for the Project through the following document prepared by Magma Metals:

- Magma Metals (Canada) Limited, 2010: Mining Title Opinion: email from Allan MacTavish, Exploration Manager, Magma Metals, to AMEC, dated 18 September, 2010.

This information is used in Section 4.4 of the Report.

3.3 Environmental

The QPs have relied upon the environmental status for the Project through the following environmental reports prepared for Magma Metals:

- Dennis A. Forbes & Associates, 2011: Socio-Economic Base Line Report for Magma Metals Thunder Bay North Project: unpublished report prepared by Dennis A. Forbes & Associates acting as subcontractors for DST Consulting Ltd for Magma Metals (Canada) Ltd, February 2011
- DST Consulting Ltd, 2008: Magma Project Trip Report: unpublished report prepared by DST Consulting Ltd for Magma Metals (Canada) Ltd., October 2008
- DST Consulting Ltd, 2009a: Thunder Bay North Project 2008 Hydrology Report: unpublished report prepared by DST Consulting Ltd for Magma Metals (Canada) Ltd., January 2009
- DST Consulting Ltd, 2009b: Thunder Bay North Project 2008 Aquatic Baseline Study Report: unpublished report prepared by DST Consulting Ltd for Magma Metals (Canada) Ltd., January 2009
- DST Consulting Ltd, 2009c: Thunder Bay North Project 2009 Aquatic Baseline Study Report: unpublished report prepared by DST Consulting Ltd for Magma Metals (Canada) Ltd., February 2010
- DST Consulting Ltd., 2010a: Thunder Bay North Project 2009 Hydrology Report: unpublished report prepared by DST Consulting Ltd for Magma Metals (Canada) Ltd, March 2010

- DST Consulting Ltd., 2010b: Thunder Bay North Project Tailings and Waste Rock Scoping Report: unpublished report prepared by DST Consulting Ltd for Magma Metals (Canada) Ltd, March 2010
- Minesite Drainage Assessment Group, 2010: Thunder Bay North Project Minesite Drainage Chemistry and ML-ARD Phase I Report: unpublished report prepared by Minesite Drainage Assessment Group acting as subcontractors for DST Consulting Ltd for Magma Metals (Canada) Ltd, December 2010
- William Ross Archaeological Research Associates, 2010: A Stage I and Stage II Archaeological Assessment of Current Lake - District of Thunder Bay: unpublished report prepared by William Ross, Archaeological Research Associates acting as subcontractors for DST Consulting Ltd for Magma Metals (Canada) Ltd, July 2010.

This information is used in Sections 4.9 and 19.3 of the Report.

4.0 PROPERTY DESCRIPTION AND LOCATION

4.1 Location

The Thunder Bay Project is situated approximately 50 km northeast of the city of Thunder Bay, within the Thunder Bay Mining Division, Ontario, Canada. Project centroids are approximately latitude 45º46' N, and longitude 88º55'W.

The Project contains the Current Lake, Bridge, and Beaver Lake Zones that occur within the Current Lake Igneous Complex.

4.2 Mineral Property and Title in Ontario

4.2.1 Mineral Title

The Mining Lands Section administers patented, leased and licensed mining lands across the province:

- Unpatented mining claims are parcels of Crown land staked in accordance with the Mining Act. Claim holders have the exclusive right to explore for minerals and have a right to acquire a mining lease for the purpose of mining. The claim holder has a right to transfer or sell an interest in the mining claim
- A mining rights patent may include the surface rights or both the surface and mining rights and may be held by one or more individuals or corporations. A patent (or lease) is required in order to produce a mineral product for sale. Mining patents were issued under the Mining Act in the past and are no longer a common method of acquiring mineral tenure
- Other Crown patents may include mining rights. Typically, any land granted before 1913 conveys mineral rights ownership
- Freehold patented mining lands are lands originally granted for mining purposes, or mining rights that were severed from the surface rights after their original grant. Patented mining lands are liable to mining land tax. Lands are taxable, if they are being used for mining purposes, no matter what legislation they were granted under
- Under the Mining Act, a lease (or patent) is required in order to produce a mineral product for sale. Leases are now issued for 21-year terms, but leases for 10-year terms still exist. Leases have associated work commitments and fees. Ten-year leases are renewable in perpetuity for periods of ten years, providing the renewal application is lodged 90 days before expiry of the lease. A 21-year lease may be renewed provided that the lessee can prove that the mining lease(s) is being used

for mining purposes and meets(s) one of the following criteria, and application for renewal is made prior to the expiry date of the lease:

- exploration and/or development work has been or is currently being performed on the lease, during the term of the lease
- the lease is part of a larger contiguous mining land holding which, during the term of the lease, has been or is currently being explored and/or developed
- the lessee will demonstrate a commitment to perform future exploration and development work (e.g. work contracts, option agreements, etc.) and will provide a certified statement(s) of expenditure after three years
- a mineral deposit has been located which has the potential of being worked under favourable economic conditions
- actual production (mining) and/or ongoing development work is being carried out with the intention of leading to production.

- Rent is applied to all mining leases
- Mining Licenses of Occupation were historically issued for lands primarily under water. Licenses do not expire. Rent also applies to Mining Licenses of Occupation.

4.2.2 Surface Rights

A holder of a mining lease may be allowed to lease available surface rights within or outside of the mining lease for the purpose of mining or exploration of the mining rights. Some mining projects may require the acquisition of Crown lands under the Public Lands Act administered by the Ministry of Natural Resources. These circumstances are usually related to the acquisition or some form of land tenure to accommodate access or infrastructure such as roads, power lines, pipelines and other facilities. Where surface rights are held by parties other than the mining company, a legal agreement with the owners must be concluded.

4.2.3 Environmental

Development of a mineral project can require a variety of environmental permits and approvals depending on the size and type of project, facilities being constructed, location and other factors. Small exploration projects will trigger few actual approvals; however, many environmental regulations and standards will apply whether there is a specific approval to be issued or not. Larger-scale projects and mine construction projects will require approval prior to being able to commence a particular activity.

Key areas that need to be considered are:

- Water
- Discharging industrial wastewater (industrial sewage works)
- Septic systems (domestic sewage)
- Operation of a treatment plant for human/domestic sewage
- Drinking water (potable water)
- Well drilling and abandonment
- Air emissions.

4.2.4 Closure Plans

For all new advanced exploration or mining projects a certified Closure Plan is required prior to development. Once filed an operator is legally required to operate according to the Closure Plan.

An operator must take all reasonable steps to progressively rehabilitate a site whether closure has commenced or a Closure Plan has been filed. A report must be filed to the Director of Mine Rehabilitation within 60 days of completing the work.

4.2.5 Windpower Development on Crown Land

Procedural directions relating to development to implement Policy PL 4.10.04 “Onshore Windpower Development on Crown Land” (Ministry of Natural Resources, Ontario, 2010), state, in summary, that:

- Where a mining claim was staked prior to the windpower application:
  - The mining claim holder has a first right of refusal to the surface rights, and the windpower applicant must obtain the written consent of the claim holder to release the surface rights;
  - If the mining claim holder will not release the surface right, the matter may be referred to the Mining and Lands Commissioner for a determination of the surface rights;
  - If a mining claim holder releases the rights to the surface, they retain the right to proceed with mineral exploration work.

- Where a mining claim was staked after the windpower application:
  - The mining claim holder is subject to the prior application and the windpower application may proceed;

- The mining claim holder will be included as a stakeholder in the stakeholder consultation;
- The mining claim holder has the right to proceed with mineral exploration work.

In either event, both the windpower applicant and the mining claim holder have the right to pursue their respective interests, subject to any other decision that may be made by the Mining and Lands Commissioner. However, the windpower applicant must ensure that it does not cause any damage to any exploration workings or claim posts installed by the claim holder, and the mining claim holder must ensure that it does not cause any damage to any installations made by the windpower applicant. Any such damages are subject to compensation pursuant to Sections 79(2) and (3) of the Mining Act.

4.3 Mineral Tenure

The Project consists of 219 original, unpatented, mining claims (2,551 16 ha claim units) covering an aggregate area of 40,816 ha (Figure 4-1). Claim details are summarized in Appendix A. The mineral resources estimated for the Beaver Lake, Bridge, and Current Lake Zones are situated within claims 842189, 842186, and 4210157. Magma Metals owns 100% of all claims within the Project, except four claims, totalling 30 units (480 hectares), covered by two underlying option agreements. These are discussed in Section 4.6.

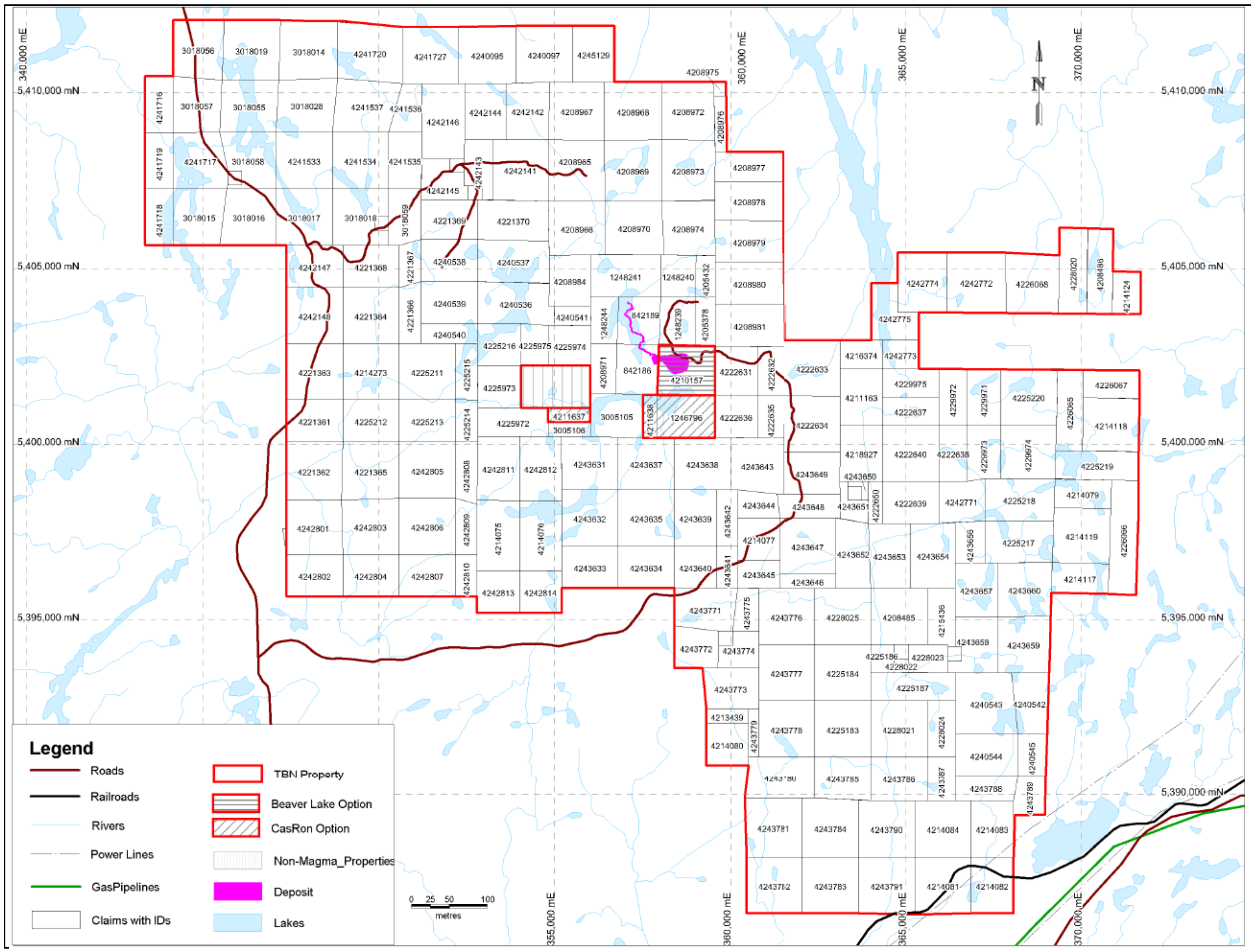
The Project contains no patented or leased claims. None of the claims have been legally surveyed; this is not a requirement under Ontario legislation. AMEC was supplied with documentation that showed that required fees and duties have been paid to the appropriate regulatory authorities, and the claims are in good standing. Magma Metals advised AMEC that all work program reports have been completed as and when due.

Magma Metals is active in the greater Thunder Bay North area, and in addition to the Project, has a number of ground holdings that are at the exploration stage.

4.3.1 Windpower

Magma Metals has advised that some of the claims in the Thunder Bay North area are subject to windpower claims, as indicated in Appendix A. These claims are located about 8–9 km from the Current Lake and Beaver Lake areas, in rugged terrain. It is not expected that any accesses, infrastructure, or potential mining operations for the Thunder Bay North Project would be affected by construction of wind turbines or supporting facilities for power generation on these claims.

Figure 4-1: Project Tenure Plan



Note: Figure courtesy Magma Metals

4.4 Surface Rights

Mineral claims are located on Crown lands, and therefore surface rights are acquired as part of the claim process.

4.5 Royalties

A group of 32 claims, which formed the initial project area (refer to Section 4.6) is subject to a 3% net smelter royalty (NSR), one-third of which can be purchased by Magma Metals at any time for C$1 million. Claims subject to the royalty are summarized in Table 4-1, and are included in Figure 4-1. These claims include claims 842189 and 842186 that host part of the mineral resource estimate. Advanced NSR payments of C$50,000 per annum are payable from the fifth anniversary of Magma Metal's original listing on the Australian Stock Exchange (ASX). This anniversary occurs in 2011.

4.6 Agreements

Magma optioned the Project claims from Dr. Gerald Harper and Dr. Graham Wilson in September 2005. The single-claim Beaver Lake Property (claim 4210157) was optioned from Casimir Zimowski and Ron Pizzolato on October 6, 2006, and the CasRon Property (claims 1246796, 4211637, 4211683) from the same vendors on December 19, 2007. An amendment to the Beaver Lake Agreement was prepared after both parties staked additional claims in the area.

Under an option agreement dated November 28, 2006 and amended on March 5, 2008, the sale of the Beaver Lake Property (claim 4210157, refer to Figure 4-1) was subject to the staged payment of C$100,000, over a four-year period, the payment of C$1,000,000 at any time on or before October 6, 2011, and a work expenditure of C$40,000 before October 6, 2007, and the issuance of 200,000 shares at any time on or before October 6, 2011. Magma Metals advised AMEC that, as at 4 October 2010, the vendors have received a total of C$100,000 in option payments and the required work commitment has been met.

Under an option agreement dated December 19, 2007 the sale of the three claims comprising the CasRon Property (claims 1246796, 4211637, 4211683, refer to Figure 4-1) was subject to the staged payment of C$125,000, over a four-year period, the payment of C$1,000,000 at any time on or before December 19, 2012, and a work expenditure of C$50,000 before December 19, 2008. Magma Metals advised AMEC that at 19 December 2010, the vendors have received a total of C$475,000 in option payments and the required work commitment has been met.

Table 4-1: List of Claims Subject to 3% NSR

Area	Claim Group	Claim Number
Tartan Lake (G-2706)	Fitzpatrick	4214075
Tartan Lake (G-2706)	Fitzpatrick	4214076
Greenwich Lake (G-2705)	Greenwich Lake	4216374
Greenwich Lake (G-2705)	Greenwich	4222631
Greenwich Lake (G-2705)	Greenwich	4222632
Greenwich Lake (G-2705)	Greenwich	4222633
Greenwich Lake (G-2705)	Current Lake	842186
Greenwich Lake (G-2705)	Current Lake	842189
Greenwich Lake (G-2705)	Current Lake	1248239
Greenwich Lake (G-2705)	Current Lake	1248240
Greenwich Lake (G-2705)	Current Lake	1248241
Greenwich Lake (G-2705)	Current Lake	1248244
Greenwich Lake (G-2705)	Current Lake	4205378
Greenwich Lake (G-2705)	Current Lake	4205432
Greenwich Lake (G-2705)	Current Lake	4208965
Greenwich Lake (G-2705)	Current Lake	4208966
Greenwich Lake (G-2705)	Current Lake	4208967
Greenwich Lake (G-2705)	Current Lake	4208968
Greenwich Lake (G-2705)	Current Lake	4208969
Greenwich Lake (G-2705)	Current Lake	4208970
Greenwich Lake (G-2705)	Current Lake	4208971
Greenwich Lake (G-2705)	Current Lake	4208972
Greenwich Lake (G-2705)	Current Lake	4208973
Greenwich Lake (G-2705)	Current Lake	4208974
Greenwich Lake (G-2705)	Current Lake	4208975
Greenwich Lake (G-2705)	Current Lake	4208976
Greenwich Lake (G-2705)	Current Lake	4208977
Greenwich Lake (G-2705)	Current Lake	4208978
Greenwich Lake (G-2705)	Current Lake	4208979
Greenwich Lake (G-2705)	Current Lake	4208980
Greenwich Lake (G-2705)	Current Lake	4208981
Greenwich Lake (G-2705)	Current Lake	4208984

4.7 Permits

4.7.1 Exploration

Magma Metals has informed AMEC that work completed to date has been under the appropriate local, Provincial and Federal laws required for exploration-level activities.

The relevant permits were acquired from the Ontario Ministry of Health for the sewage storage and grey water sump constructed for the field camp.

Two Land Use Permits were issued by the Ontario Ministry of Natural Resources in November 2010 for the construction of a 0.75 hectare core storage compound and an upgraded exploration camp. Both compounds are located south of the deposit near Escape Lake.

4.7.2 Project Development

Additional permits would be required to support any Project development. Key permits would cover operational aspects, waters, discharges, transport and access, power, and the environment. Preliminary discussions have been held with Provincial and Federal agencies likely to be involved in any permitting process for Project development, and have covered likely permitting frameworks and timelines.

4.8 Environmental

4.8.1 Existing Liabilities

Magma Metals has informed AMEC that current project environmental liabilities are restricted to exploration site activities and access trails constructed to service exploration programs.

4.8.2 Baseline Studies

Magma Metals contracted DST Consulting Engineers (DST) in November 2007 to commence environmental baseline studies of the in the vicinity of the Current and Escape Lake drainage areas. The study was designed to acquire sufficient baseline environmental information to support the Environmental Assessment Process and subsequent project permitting. To date, the study has included evaluation of the following:

- Surface water and sediment quality
- Lake and stream sediment taxonomic diversity of benthic invertebrates
- Fisheries resources (fish and fish habitat)
- Hydrology (stream and river discharge).

In 2009 monitoring was extended to include Steepledge Lake, Ray Lake, Lone Island Lake and Fitzpatrick Lake.

In mid-2010, acid rock drainage (ARD) potential in association with rock geochemistry assessments, meteorological, noise, socio-economic, and archaeological studies were initiated.

In September 2010, the archaeological survey, completed by Ross Archaeological Research Associates on behalf of DST Consulting over the likely Project footprint and infrastructure corridors indicated that the areas reviewed had low potential for archaeological resources and that further survey work within the project area would not be required.

As the Project advances, additional work related to the environmental assessment and permitting of a mining operation in Ontario, Canada will be conducted.

4.9 Socio-Economics

Magma Metals have met with the leadership of regional Aboriginal groups to share preliminary information about the Project and to discuss the most appropriate ways to involve their communities in the Project. Discussions have been positive and are ongoing.

A socio-economic study was initiated by Magma Metals in September 2010. This work was conducted by Dennis A. Forbes & Associates on behalf of DST Consulting Engineers. The purpose of the study was to define the present economic and social situation in the Project area prior to development. This baseline will assist in determining the impact of the mine on the region.

4.10 Comment on Section 4

In the opinion of the QPs, the following conclusions are appropriate:

- Information from legal experts support that the mining tenure held is valid and is sufficient to support declaration of Mineral Resources
- The mineral concessions have not been surveyed; survey is not required under Ontario regulations
- AMEC was provided with breakdowns of work expenditures for the mineral concessions. These indicate the mineral concessions on which the Mineral Resources have been estimated are in compliance with Ontario regulations in relation to work expenditure requirements.
- Mineral claims are located on Crown lands, and therefore surface rights are acquired as part of the claim process.

- Permits obtained by the company to undertake exploration are sufficient to ensure that activities are conducted within the regulatory framework required by the Ontario Government
- Additional permits will be required for Project development; preliminary discussions have been held with the relevant Federal and Provincial authorities
- At the effective date of this report, environmental liabilities are restricted to exploration sites and access roads constructed to service exploration programs
- The current state of knowledge on environmental and permit status for the Project supports the declaration of Mineral Resources and preliminary mine planning.

5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 Accessibility

The property is accessible using a series of intermittently-maintained logging roads branching from Armstrong Highway 527, which in turn branches from the Trans-Canada Highway 11-17 a short distance east of the city of Thunder Bay. Access to the Project from Thunder Bay is as follows:

- 10 km east along Highway 11/17 to Highway 527;
- 22.7 km north on Highway 527 to the Escape Lake logging road;
- 17 km east on the Escape Lake road to the Shallownest East logging road;
- 5.3 km north on the Shallownest East road to an unnamed logging road that branches to the west
- 3 km along this road to the immediate vicinity of the Project.

The Escape Lake and Shallownest East logging roads are intermittently maintained by local logging contractors; however, the remaining access roads, to and within, the Project are regularly maintained, winter and summer, by Magma Metals.

The closest commercial airport is at Thunder Bay.

5.2 Climate

The climate is continental with a temperate marine influence from the close proximity of Lake Superior. Temperatures generally range from winter lows of about -35°C to summer highs of about 35°C. Average winter temperatures are in the range of -15°C to -20°C, and average summer temperatures are in the range of 20°C to 25°C. Annual rainfall is approximately 70 cm with 55–60 cm of rain and 200–300 cm of snow annually. Average winter snow depths in the region are about 100–150 cm.

Exploration activities can be curtailed by snowmelt conditions. It is expected that any future mining operations will be able to be conducted year-round.

5.3 Local Resources and Infrastructure

The closest community to the Project is the village of Dorion, about 35 km east of the Project site. The largest community in Project proximity is the city of Thunder Bay

(50 km). Canada has sufficient experienced and skilled professionals to run any mining operation that could be constructed in the Project area.

5.3.1 Infrastructure

There is currently no existing Project infrastructure. Exploration activities are currently supplied out of Thunder Bay.

The PA envisages construction of a number of mine-related buildings and accommodation infrastructure, including:

- Multi-purpose complex: providing mine services, such as a maintenance bay for minor repairs and maintenance of mobile equipment, administration offices, men's and women's dry, and a truck shop.
- Warehouse building: comprising warehouse storage, fire water, the potable water tank, and a fire pump skid
- Process building
- Crusher pad
- Water supply, distribution, and treatment systems
- Modular sewage treatment system
- Incinerator
- Small explosives storage magazine
- Fuel storage tanks
- Temporary accommodation facilities: 100 person camp for construction purposes. No on-site permanent accommodation will be provided for personnel as it is assumed that the workforce, including management staff, will reside in the town of Thunder Bay or other nearby communities, and commute, via buses, on a daily basis.

A new access road from Highway 527 (Armstrong Highway), 11 km west of the site, will be constructed as the main site access road.

Infrastructure that will be constructed to support mining activities will include an open pit, underground mine, two waste rock storage facilities, a tailings facility, cofferdam and two small water retention dams, and two water diversion channels. Figure 5-1 provides the conceptual project infrastructure layout plan. Figure 5-2 provides a map of the project area showing the proposed access road, power line and tailings facility.

Figure 5-1: Project Infrastructure Layout Plan

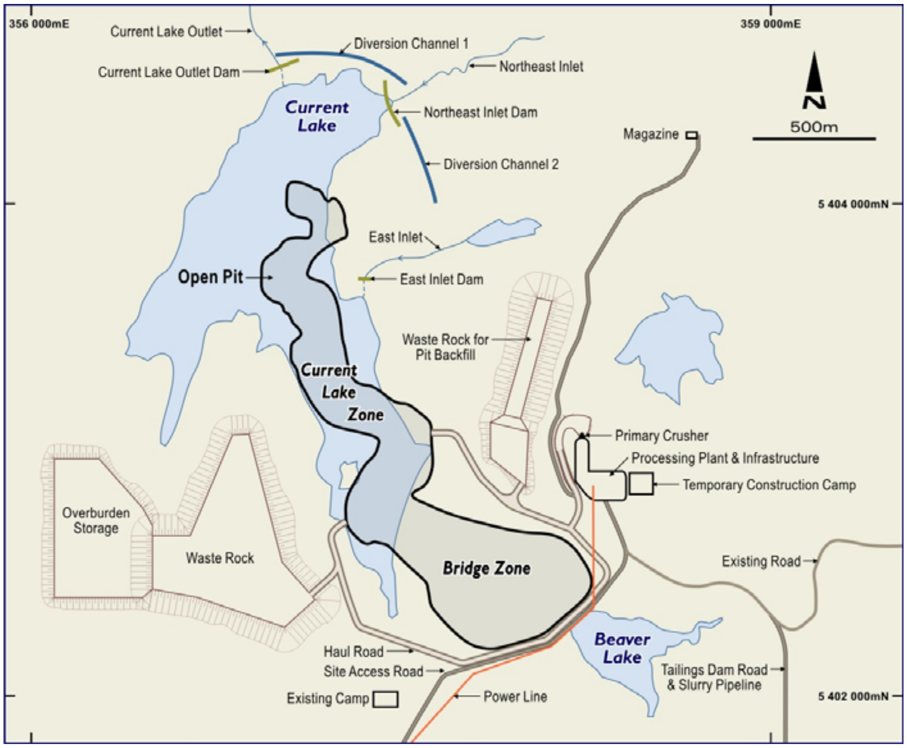


Figure 5-2: Project Area Map

5.3.2 Power

Power is available at Thunder Bay, where a medium-size coal-fired generating plant is located. A wind-farm, the Greenwich Wind Farm is in initial construction stages, and has a proposed capacity of 100 MW. The farm location is about 9 km east–northeast of the Project area.

Power supply for the Project site as envisaged in the PA will comprise 120 kV sourced from an existing power transmission line from the Hydro-One sub-station in Thunder Bay. The incoming 16 km long transmission line will be terminated at a new main site substation situated adjacent to the mill. Mine facilities will be supplied with power through radial feeders originating at the main substation. Electrical rooms will be distributed around the site and located as close as possible to the major electrical loads. Process control for the plant will use a network of distributed controllers and human–machine-interface (HMI) equipment. The degree of instrumentation will be the minimum required for safe operation of the plant and efficient control of the process using a minimum number of operators.

Site emergency power will be provided by a standby power plant rated for the maximum power required in the event of a utility power failure. A nominal 1.1 MW modular plant consisting of two generator sets is included to meet the anticipated emergency load.

5.3.3 Water

The potable water supply will initially be designed to support a construction camp with a population of approximately 100 people; it will then service a permanent work force. Raw water will be provided from a well, and a prefabricated water treatment module will treat water to drinking water standards.

Process water will be reclaimed from the tailings facility.

5.3.4 Communications

Communications for exploration-level activities have primarily been by email, as cell-phone service can be unreliable. A cell phone booster was installed in the main logging facility, and this provides reliable cell coverage. Backup communications are undertaken using satellite phones.

5.4 Physiography

Project elevations vary by about 40 m, from 470 masl to about 510 masl, averaging approximately 485 masl.

Outcrop is locally rare. Glacial overburden depth is generally shallow, rarely exceeds 20 m, and primarily consists of ablation till, minor basal till, and moderate expanses of outwash sand and gravel.

Swamps, marshes, small streams, and small to moderate-size lakes are common. Drainage is provided by the numerous, usually unnamed streams that lead to the Current and MacKenzie rivers, located to the northwest and the southeast, respectively. Both rivers drain directly into Lake Superior, which is situated about 25 km to the south of the centre of the Project area.

Primary vegetation comprises boreal forest of black spruce, jack pine, trembling aspen, and white birch. Large swathes of the Project area have been clear-cut logged, and are re-generating after tree re-planting programs performed by the logging companies. The forest around the Project area currently provides habitat for wildlife species that are common to mixed boreal forests in Ontario.

No significant fisheries values have been identified to date within the Project area and no aquatic species at risk or endangered species have been encountered in surveys completed to date (DST Consulting, 2007).

5.5 Comment on Section 5

In the opinion of the QPs, the existing and planned infrastructure, availability of staff, the existing power, water, and communications facilities, the methods whereby goods are transported to the mine, and any planned modifications or supporting studies are well-established, or the requirements to establish such, are well understood by Magma Metals, and can support the declaration of Mineral Resources and preliminary mine planning.

Magma Metals holds over 40,000 ha of mineral tenure. In the immediate vicinity of the known Project deposits, and within the Magma Metals ground holdings, there is sufficient area to support construction of a mining operation, including sufficient space for an open pit and underground mine, process facilities, mining-related facilities such as workshops, offices and roads, and tailings and waste facilities.

6.0 HISTORY

Initial exploration in the general region was for uranium. Nickel, copper and platinum-group element (PGE) exploration commenced in the early 1990s.

Prospectors Dr. Graham Harper, Dr. Gerald Wilson, and F. Manns undertook rock chip sampling, prospecting, lithogeochemistry, soil sampling, soil sampling, ground magnetic surveys and petrographic and geochemical research in the area of Onion Lake, Tartan Lake, Current Lake and Greenwich Lake areas during 1993–2000. This work led, in 2001, to the discovery of mineralized ultramafic (peridotite) boulders along the western shoreline of Current Lake that contained elevated Pt–Pd–Cu–Ni grades.

Pacific North West Capital Corporation (Pacific North West Capital) optioned the property in 2001. Exploration completed during 2001–2002 comprised ground magnetic and electromagnetic surveys and a six hole core drill program (813.5 m). No mineralized ultramafic rocks were encountered in the cores, and Pacific North West Capital did not proceed with the option.

Magma Metals optioned the Current Lake area from Dr. Wilson and Dr. Harper in 2005. At that stage, the Thunder Bay North project, as it was termed, comprised 26 contiguous mining claims. In 2006, the Beaver Lake claim was optioned, and in 2007, an additional option on the three claim CasRon property was signed

Work completed by Magma Metals to 2010 has included a number of airborne and ground geophysical surveys, geological and structural mapping, petrological and mineralogical studies, and commencement of baseline environmental studies.

Between December 2006 and June 2009 Magma Metals drilled 338 core drill holes. A total of 211 of these drill holes (18,854 m) were drilled at Current Lake on sections spaced at 50 m intervals. At Beaver Lake, 122 core holes (31,562 m) were drilled on sections spaced at 100 m. This work identified two major areas of Cu–Ni–Pt–Pd sulphide mineralization, at Beaver Lake and Current Lake. An initial mineral resource estimate was performed in 2009 by SRK Consulting Ltd (SRK) on behalf of Magma Metals. That estimate has been superseded and is no longer considered current.

Additional core drilling and geophysical surveys were completed during 2010. A portion of these data were used to support the mineral resource estimate in Section 17. The mineral resource is the basis for the PA that is the subject of the remainder of this Report.

7.0 GEOLOGICAL SETTING

7.1 Regional Geology

The Project is hosted in the Quetico Subprovince of the Superior Province (Figure 7-1).

The Quetico Subprovince is interpreted to be a fore-arc accretionary prism deposited during and after peak volcanic activity within the adjacent Wawa, Wabigoon, and Abitibi Subprovinces between 2,698 and 2,688 million years ago. The subprovince is approximately 70 km wide, and forms a linear strip of moderately to strongly metamorphosed and deformed clastic meta-sedimentary rocks and their anatectic melt equivalents.

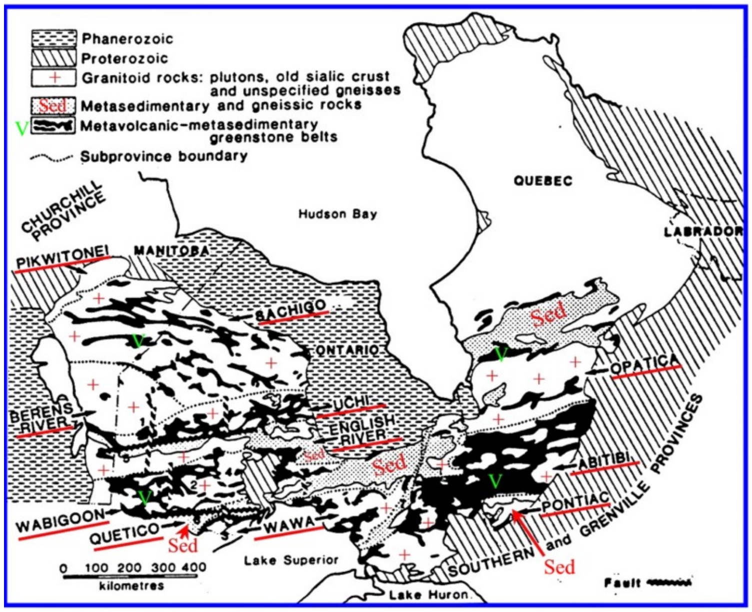
The sedimentary rock protoliths that have been identified include turbiditic wacke and siltstone with rare iron formation, pelite, and conglomerate, which were deposited within a large, laterally extensive, submarine basin. Volcanic rocks are extremely rare; however, intrusive rocks are common. These rocks consist of biotite–hornblende–magnetite granitoid bodies of mixed felsic and mafic compositions with volumetrically minor ultramafic units, and one- and two-mica granitoids. The intrusive activity is interpreted to have occurred 5–20 million years following accumulation of the sedimentary pile.

Overlying the Quetico Subprovince rocks in the Lake Superior region are sedimentary rocks of the 1,860 Ma, Paleoproterozoic Animikie Group. These rocks, in the Thunder Bay area, unconformably overlie Archean basement and form a homoclinal sedimentary sequence consisting of Gunflint Formation chemical sediments and argillites overlain by Rove Formation shales and wackes. At approximately1,590 Ma, the Mesoproterozoic Badwater Intrusion was emplaced, followed at 1,537 Ma, by the intrusion of the English Bay igneous complex.

Sedimentary rocks of the Sibley Group unconformably overlie the Animikie Group south of Lake Nipigon, and consist of quartz arenite, argillaceous dolomite, and mudstones. These rocks have age dates in the range from 1,670 Ma to 1,450 Ma.

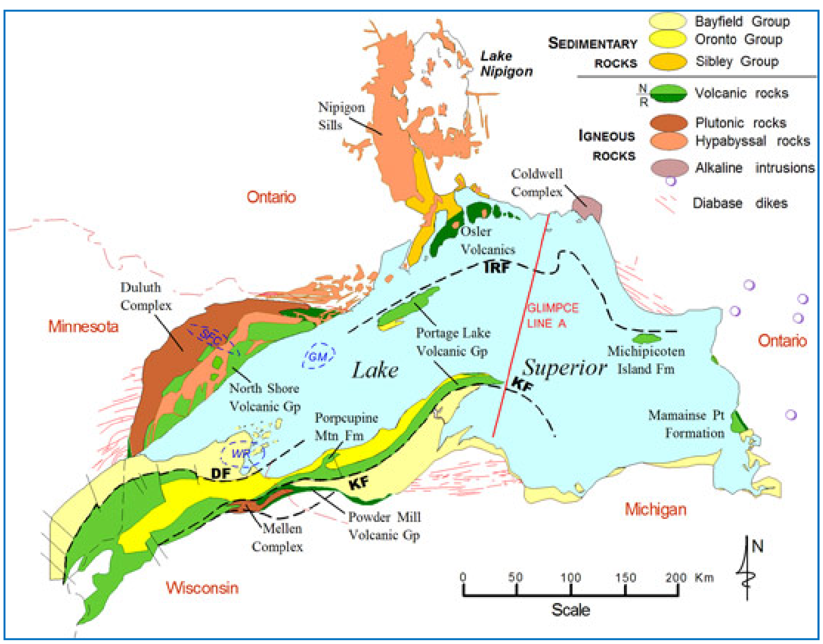
The final Proterozoic event was deposition of the Mesoproterozoic (1,140 to 1,090 Ma) Keweenawan Supergroup. The Keweenawan consists of a thick sequence of subaerial lava flows, locally intrusive rocks, and an upper succession of sedimentary rocks that were deposited within normal, fault-bounded and asymmetric grabens, developed within and marginal to the Mid-continent (Keweenawan) Rift (Figure 7-2).

Figure 7-1: Generalized Geology Map, Superior Province



Note: Figure from University of Western Ontario website.

Figure 7-2: Generalized Geology of the Lake Superior Area



Note: figure from Miller, 2007. Dashed lines indicate major reverse faults.
Red line denotes GLIMPCE Line A,a seismic reflection profile. Blue dashed lines indicate buried crustal blocks.

The rift, now largely beneath Lake Superior, contains as much as 30 km of fill, with volcanic rocks comprising about two-thirds of the total (Miller, 2007). Geophysical data also suggest that a volume of magma nearly equivalent to that filling the rift underplated the crust (Miller, 2007). Considering the rift fill, the volume of underplated material, and the unknown amount of eroded material, the Mid-continent Rift is one of the world's largest Large Igneous Provinces and is an important emerging Ni–Cu–PGE province.

Mafic to ultramafic intrusive rocks in Ontario, related to the formation of the Keweenawan Supergroup, include:

- Voluminous, laterally extensive diabase sills and associated dykes (Nipigon, Logan, and Pigeon River Sills)
- Moderate to very large-size composite and layered mafic intrusions (Duluth Complex, Crystal Lake Gabbro)
- Layered and differentiated ultramafic intrusions (Seagull, Hele, Kitto, and Disraeli Intrusions),
- Volumetrically minor ultramafic conduit-like intrusive complexes (Current Lake Intrusive Complex).

The layered and differentiated Seagull, Hele, Kitto, and Disraeli ultramafic intrusions that are hosted within and adjacent to the Nipigon Basin (one arm of the failed Mid-continent Rift valley extended north to Lake Nipigon in Ontario, forming the Nipigon Embayment or Basin) are host nickel, copper and platinum group element (PGE) sulphide mineralization. The intrusions appear to be primarily sill-like, with the exception of the Seagull Intrusion, which has a lopolithic form. Intrusion emplacement appears to have been fault controlled, but distinct magma feeder zones to the intrusions have not been identified.

In addition, the Duluth Complex and Crystal Lake gabbro also host low-grade Ni–Cu mineralization. The Duluth Complex consists of a large composite intrusion of troctolite and gabbro derived from periodic tapping of an evolving magma source. The complex formed from up to 40 separate sheet-like and cone-shaped sub-intrusions. Low to medium-grade copper–nickel sulphide mineralization that locally contains anomalous PGE concentrations were identified in the basal zones of the Partridge River and South Kawishiwi intrusions, within the Duluth Complex. At least nine deposits have been delineated in the basal 100 m to 300 m of both intrusions. At Crystal Lake, sulphide nickel mineralization is associated with taxitic textures in a medium- to coarse-grained gabbro.

The conduit-like intrusions hosting nickel, copper and PGE sulphide mineralization at Current Lake and Beaver Lake are the first of that type recognized in the province. The complex has been termed the Current Lake Intrusive Complex, and is part of a network of magma conduits or chonoliths formed in association with the Mid-continent Rift.

7.2 Project Geology

Within the Project area, the main rock types are Archean granites and meta-sedimentary rocks of the Quetico Subprovince, and Keweenawan Supergroup mafic to ultramafic intrusive rocks and related intermediate to mafic hybrid intrusive rocks of the Mid-continent Rift.

Rock types present within the Project area consist of:

- Felsic to intermediate granitoid rocks identified as granodiorite, tonalite, and pegmatitic leucogranite
- Strongly deformed and metamorphosed clastic meta-sedimentary rocks derived from wacke, siltstone, and more rarely, pelite
- Relatively undeformed and unmetamorphosed mafic to ultramafic intrusive rocks of the main phase of the Current Lake Intrusive Complex have been identified as olivine melagabbro, feldspathic peridotite, and lherzolite. These rocks are closely associated with a variety of related intermediate to mafic intrusive rocks that comprise the initial intrusive phase of the Current Lake Intrusive Complex. These early phase rocks are locally fragment/inclusion-rich, strongly contaminated, hybridized, and hematized.

7.2.1 Archean Lithologies

Granitoids

The primary granitoid rocks are granodiorite and tonalite with minor amounts of granite and pegmatitic leucogranite. Granitoid bodies are typically medium grained with localized, narrow intervals of pegmatitic and aplitic rock. Shear deformation can be intense on a local scale, in the form of narrow, discrete fault zones; however, the rocks are more typically massive to weakly foliated.

A hematitic alteration zone, 2–5 m in thickness, developed where the granitoid is in contact with olivine melagabbro. A wormy appearance developed immediately adjacent the olivine melagabbro contact and small, partially-melted granite fragments may occur within the olivine melagabbro.

Meta-sedimentary Rocks

Meta-sedimentary rocks in the area are typically derived from a mudstone, siltstone or fine grained sandstone, and range from massive to moderately foliated. Foliation orientations are typically vertical to sub-vertical relative to the surface. The meta-sedimentary rocks can be mica-rich, display quartz ± carbonate veinlets, and can be variably sheared and altered. Shearing and faulting occur on a local scale and can be intense. Alteration consists of chlorite, sericite and epidote, and is primarily associated with fractures.

Dykes of granitoid composition cut the meta-sedimentary rocks. Where in contact with the olivine melagabbro, the meta-sediment rocks are hornfelsed (contact metamorphosed) and show hematitic alteration.

7.2.2 Mesoproterozoic Intrusions

Hybrid

The initial phase of the Current Lake Intrusive Complex is a hybrid intrusion (the Hybrid) that contains large quantities of incorporated country rock. The intrusion is termed 'Hybrid' by Magma Metals geologists, because the precursor magma incorporated so much of the surrounding country rock and the derivative rocks commonly contain rock fragments and quartz inclusions as xenoliths. The Hybrid intruded forcefully along flat-lying structures and up-dip along the east-trending granite–meta-sediment contact.

Initially a diorite, the quantities of country rock and quartz that can be incorporated into the Hybrid changed the composition to a rock type, which based on mineralogy, would be classified as diorite—primarily composed of quartz, plagioclase and amphibole. The Hybrid locally contains black pyroxene and serpentine or iddingsite after olivine and significant quantities of ilmenite and magnetite.

The contact between Hybrid and olivine melagabbro, the second intrusive event, is typically gradational over one to two metres. The contact can, however, be fairly sharp, presumably where the olivine melagabbro magma-thermally eroded into the Hybrid. Near the contact, Hybrid contains 0.5 cm to 2 cm patches of olivine melagabbro as xenoliths that gradually diminish as the olivine melagabbro is approached. Hybrid rarely contains rock fragments (xenoliths) where it is in contact with olivine melagabbro. Hybrid appears to have been hot when the olivine melagabbro was intruded, because the interface between the two appears, locally, to have been plastic in nature.

Contacts with the surrounding meta-sedimentary country rocks indicate chilled margins, with fine-grained and glassy textures. The chill zone occurs where the Hybrid is present on the lower contact of the main body on the northern margin of the Beaver Lake intrusion, throughout the Current Lake intrusion and where the Hybrid extends as "wings" away from the main intrusive bodies, in zones where the Hybrid has intruded along the flat structures. Chilled margins are rare above the main olivine melagabbro/lherzolite body at Beaver Lake, because of the large amount of alteration in these rocks.

Alteration is primarily related to fluid exsolution, with significant iron oxide staining of the Hybrid and the surrounding meta-sedimentary rocks. In general the fluids driven off by the intrusion appear to have migrated mostly upwards with significant hematite and pyrite alteration occurring above the body for metres to tens of metres, whereas the footwall contact has hematite alteration generally confined to only a few metres at most.

Olivine Melagabbro/Lherzolite

The host rock for mineralization is an olivine melagabbro–lherzolite, which forms the conduits at both the Beaver Lake and Current Lake deposits. Analysis of petrochemical data indicates formation of the olivine melagabbro–lherzolite from a basalt parent magma with approximately 6% MgO.

There are narrow zones (10 cm to several metres) of variably-textured taxitic material within the olivine melagabbro near the contact with the Hybrid. These zones contain large, altered, 1–2 cm plagioclases and very large, 1–10 cm pyroxenes, also altered, in an olivine–melagabbro groundmass. Alteration is fine-grained to microscopic, and although not formally identified, is likely to involve saussuritization of the plagioclase, and uralitization of the pyroxenes. Taxitic zones may also contain fragments as xenoliths of mafic intrusive material. In the opinion of Magma Metals geologists, such taxitic rocks appear very similar to those mapped at the Noril'sk deposits in Russia.

Current Lake

The Current Lake olivine melagabbro intrusion is a rounded conduit up to 50 m wide confined by a flat fracture–joint set and northeast-, northwest- and north-striking Keweenawan age structures. At Current Lake, the olivine melagabbro consists of 40–70% olivine and serpentine, 5–25% plagioclase, 4–12% clinopyroxene plus orthopyroxene, and up to 5% magnetite. Minor minerals present are biotite, chlorite, amphibole, carbonate and talc.

Beaver Lake

At Beaver Lake, olivine melagabbro grades into a feldspathic lherzolite and then to lherzolite, symmetrically from the bottom of the intrusion up and from the top down. The transition from lherzolite to olivine melagabbro occurs when the plagioclase content exceeds 10%.

The Beaver Lake host rocks contain between 45–70% olivine and serpentine, 1–20% plagioclase, 10–16% clinopyroxene plus orthopyroxene and as much as 5% magnetite. Minor amounts of biotite, chlorite, amphibole, carbonate and talc have also been noted.

The grain size of the olivine melagabbro and lherzolite is quite small, with the olivines averaging 1.0–1.5 mm in size. Additional minerals include chlorite, clinopyroxene, orthopyroxene, plagioclase and oxide phases and occasional clinopyroxene oikocrysts as large as 1 cm near the contacts. Serpentinization increases towards the contacts, and serpentine, chlorite, iddingsite, talc and carbonate are common alteration products.

The Beaver Lake intrusion is a flattened, sill-like (tabular) body with an irregularly-shaped floor. The intrusion appears to be deepest on the southeast side and remains open in this direction. The olivine melagabbro is commonly in contact with the footwall sediments and mineralized on the contact. Olivine melagabbro does not display chill margins along the contact with meta-sedimentary rocks. This lack of chill margins may be due to turbulent flow or that the surrounding rocks became increasingly hot from long-term flow of magma in the conduit. Locally, sulphide blebs and ocelli of previously molten sediment from 5 mm to 10 mm in size occur in olivine melagabbro near the contact. The olivine melagabbro–meta-sediment contact is locally irregular.

Figure 7-3 shows the currently known outlines of the conduits and intrusion for the Beaver Lake and Current Lake areas.

Serpentine

The amounts of serpentine present within the Current Lake Intrusive Complex are highly variable. The margins more strongly serpentinized (generally moderate with localized intervals of strong near the contacts, particularly the upper contact) than the centre/core of the intrusion, which is almost completely unserpentinized. The application of an average percentage of serpentine for the intrusion would be misleading in the opinion of Magma Metals staff, because it is not uniformly altered. The observed serpentinization within the complex is not a lower temperature, metamorphic or hydrothermal alteration that occurred after the intrusion cooled, but is, according to Magma Metals, a high temperature, late magmatic deuteric feature that is probably attributable to the concentration and movement of volatile-rich fluids/melt within the magma while the intrusion was still partially molten.

7.2.3 Structures

Structurally, the Archean rocks were deformed by reactivated pre-existing structures and later Keweenawan-age structures that cut the Archean rocks during the Proterozoic. Numerous northeast- and northwest-striking structures provided pathways for intrusion of the Current Lake Intrusive Complex.

Quetico Subprovince rocks record a progressive Archean orogeny. Early isoclinal folding with layer-parallel shearing and regional axial planar fabrics is overprinted by upright, open to tight, shallowly-plunging folding with an associated axial planar fabric. This orogeny culminated with transpressional faulting, shear zone development, minor folding, and localized east–west extension (Williams, 1991; Percival et al., 2006).

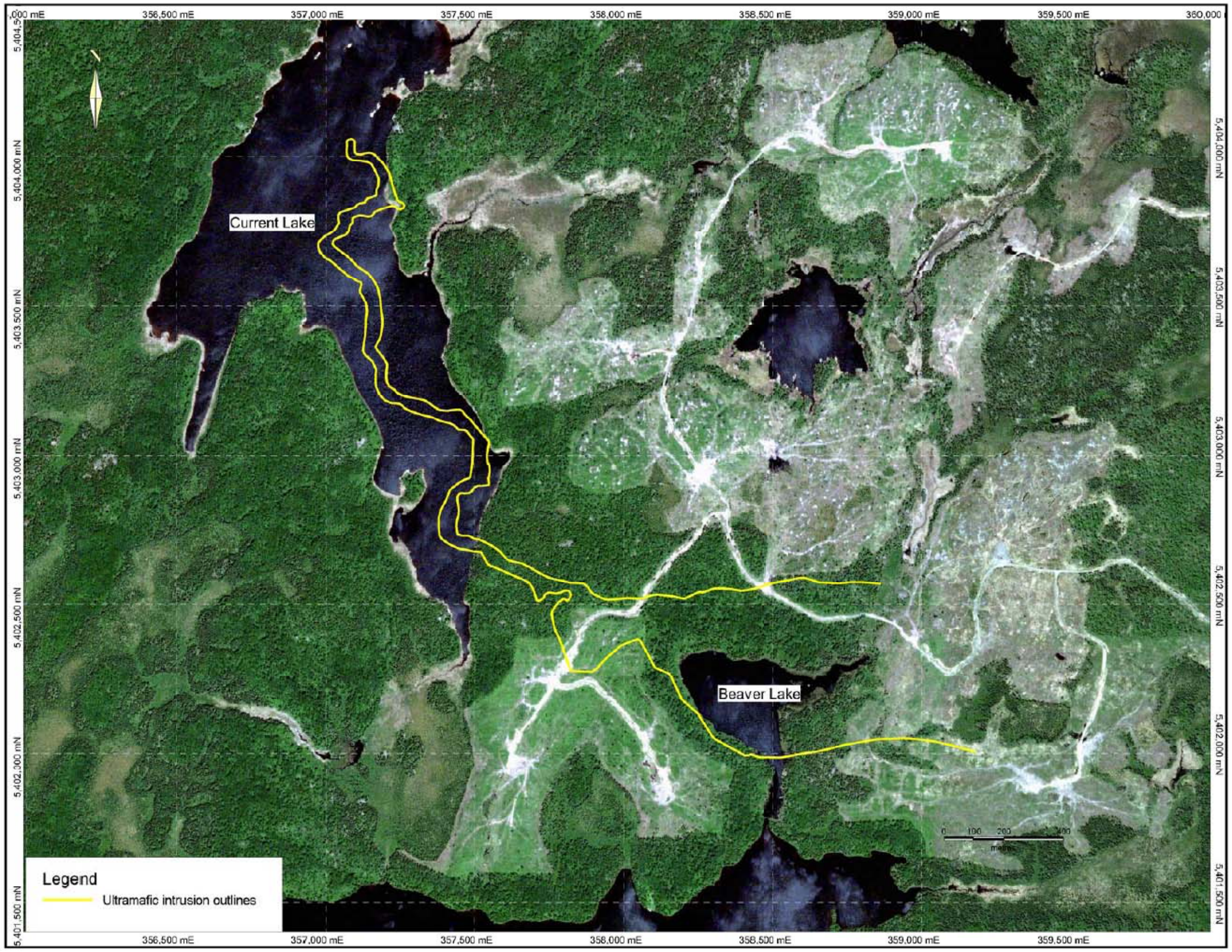
The transpressional deformation event involved dextral movement on east- and east northeast-striking faults like the Quetico Fault, which cuts the rocks of the deposit area. Small-scale but numerous, conjugate northeast-striking sinistral and northwest-striking faults offset the Archean units.

Three prominent fault sets, which strike north, northwest, and east to northeast, cut the Proterozoic Nipigon Embayment, and in places reactivated Archean-age faults (Hart and MacDonald, 2007).

In the Project area, the dominant regional foliation in Archean meta-sedimentary and felsic intrusive rocks strikes approximately 085º and dips vertically to 85º south. Asymmetric minor folds associated with the regional foliation are observed in Quetico Subprovince meta-sedimentary rocks, and suggest that steeply-dipping, shallowly-plunging, isoclinal folds are present in the Current Lake–Beaver Lake area. Proto-mylonitic fabrics with weak dextral sigma (σ)-structure of feldspar phenocrysts were observed in what is interpreted to be a splay of the Quetico Fault and cutting a peraluminous muscovite granite that bounds the Beaver Lake intrusion to the north.

The Proterozoic mafic to ultramafic intrusions hosting the Current Lake and Beaver Lake deposits post-date the Archean deformation events, but their geometries reflect the strike of earlier fault sets, including relatively flat faults, which the intrusions are interpreted to have exploited during intrusion of the Archean country rocks.

Figure 7-3: Map Showing Current Limits, Current Lake Intrusive Complex Ultramafic Intrusion



Note: Figure courtesy Magma Metals. Background shown is regional satellite image.

Post-intrusion deformation of the Proterozoic host rocks is limited. Extreme fracturing in the immediate hanging wall of the Current Lake Intrusive Complex is accompanied by brittle, fine-grained to coarse-grained fault gouge. This fracturing is irregularly distributed over the intrusion, with the thickest section coincident with the intersection of an east-striking dextral fault, a north–northeast-striking sinistral fault and a north–northwest-striking dextral fault at the north edge of Beaver Lake intrusion. In contrast to the roof, the base of the intrusion is largely undeformed with good preservation of chilled margins. Locally, minor shear zones have developed at the base of the intrusion.

Patterns in regional and deposit-scale magnetic datasets indicate minor post-intrusion fault offsets, including dextral offsets, along reactivated Archean faults. Observations from drill core confirm the limited extent of post-intrusion faulting.

7.3 Deposits

The Current Lake, Bridge and Beaver Lake Zones collectively form the nickel–Cu–PGE deposit at Current Lake. However, the different zones display different morphologies, are disproportionately mineralized, and have slight differences in mineralization tenors. The Bridge Zone is, for the purposes of this Report, the last drilled of the mineralized zones, and link the Beaver Lake and Current Lake Zones. An artificial deposit boundary between the Current Lake and Beaver Lake Zones is placed at the Quetico sedimentary rock–granite structural contact, because the morphology of the conduit changes at this point.

The conduit is completely composed of olivine melagabbro within the Current Lake and Bridge Zone portions; the mineralization within these zones always occurs within the olivine melagabbro but mineralization distribution can be variable. Locally, the disseminated mineralization dominant in those areas can completely fill the conduit and conversely, can locally only partially fill the conduit. The Hybrid forms a marginal phase in the hanging wall and footwall portions of the conduit, and commonly occurs as a thin skin along the walls of the conduit. The Hybrid is best envisaged as an earlier preparatory phase of the magmatic episode(s) that led to the formation of the conduit and its mineralization. Rarely, mineralization occurs within the basal Hybrid as pods and veinlets, but this is not typical.

The Current and Bridge Zones form a sinuous sub-horizontal tube. The mineralization within the tabular, sub-horizontal Beaver Lake portion of the deposit forms a variable mesh, at or near the base of the Beaver Lake portion of the intrusion. Strong positive correlations between Pt, Pd, Cu, and Ni and very limited post-crystallization alteration indicate preservation of a pristine magmatic system. The occurrence of mineralization throughout the chonolith in the Current Lake Zone indicates that the sulphides were entrained in the host magma. Conversely, in the Beaver Lake Zone, sulphides were deposited mainly at the lowest levels of the intrusion.

Depths to the top of the mineralization vary from under 20 m in the northwest, to as much as 450 m in the southeast. The mineralization, the conduit, and the host gabbro do not crop out.

A schematic model that outlines the locations of the deposits and the projected conduit morphology is shown in Figure 7-4.

7.3.1 Current Lake Zone and Bridge Zone

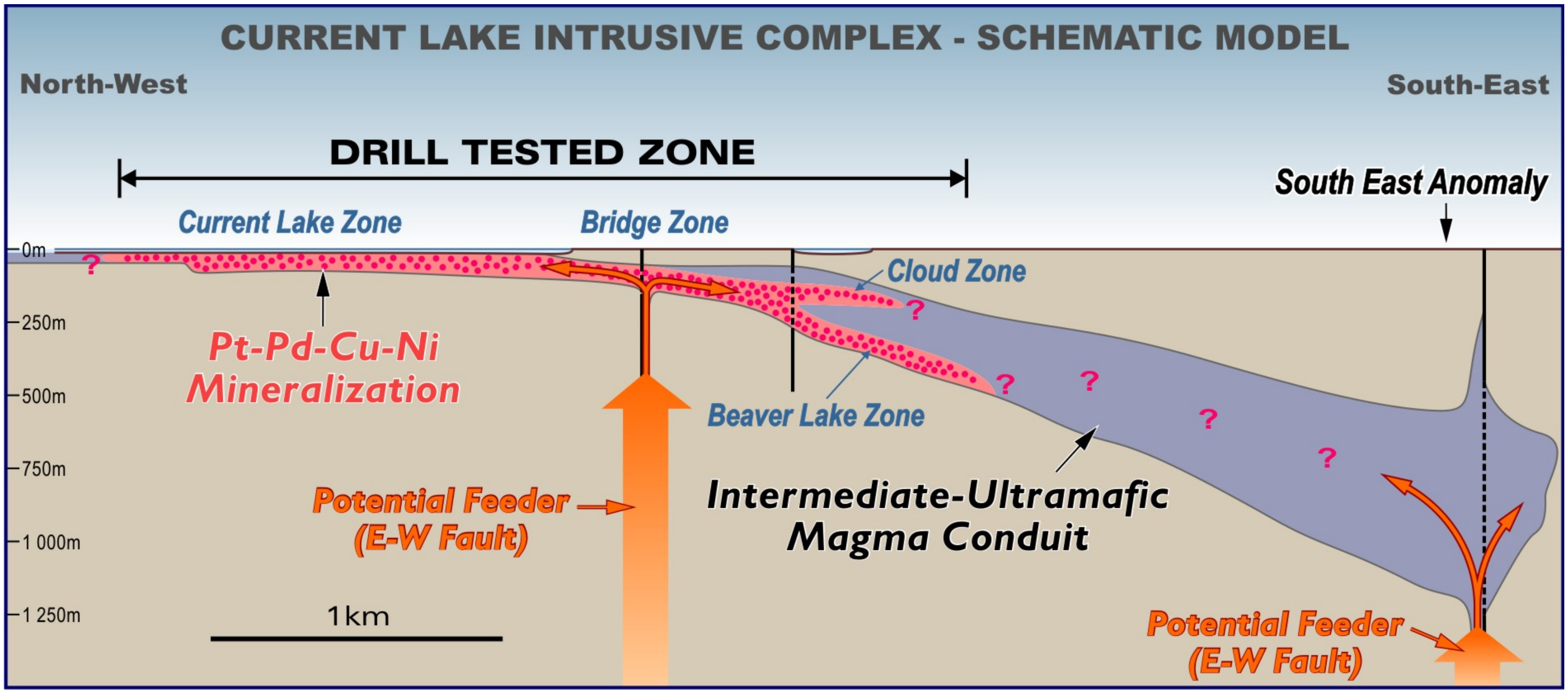
The Current Lake and Bridge Zone portions of the deposit form a narrow, almost flat-lying conduit ranging in dimensions from 30 m x 30–50 m wide and as much as 70 m tall. The olivine melagabbro in the magmatic conduit is variably mineralized. The sulphide mineralogy consists of pyrrhotite, pentlandite, chalcopyrite, pyrite and rare cubanite and violarite.

The Current Lake zone lies beneath Current Lake and is sub-horizontal, narrow, sinuous, and tube-like in morphology. The width, thickness and orientation of the host body, and its contained mineralization, changes along its length as it follows intersecting, sub-vertical and sub-horizontal fractures and faults. The magmatic conduit exhibits a slight southerly plunge with the base of the mineralized body at 45-50 m depth in the north and 90–95 m depth in the south, where it joins with the Bridge Zone.

For much of its length, the upper portions of the Current Lake Zone have been eroded away; however, due to the shallow southerly plunge, its preserved thickness gradually increases and the conduit eventually becomes completely preserved at the point just prior to western boundary of the Bridge Zone.

The Bridge Zone is hosted by granitoid rocks and is completely preserved and tube-like in form; however, it exhibits a steeper east–southeasterly plunge, when compared to the Current Lake Zone, and has a relatively well-defined strike. The top of the magmatic conduit in the Bridge Zone is 60 m below surface in the west and 125 m below surface in the east. The thickness of the conduit averages 50 m and ranges from 35 m to 65 m in width. Mineralization is continuous and relatively high-grade throughout the zone.

Figure 7-4: Deposit Model Schematic



Note: Figure courtesy Magma Metals

Sections through the Current Lake deposit, showing the varying morphology of the conduit, and typical mineralization thicknesses and orientations are presented as Figure 7-5 and Figure 7-6. Note the change in the shape of the conduit between the two example sections. A cross-section through the Bridge Zone is included in Figure 7-7; the figure shows the changing shape of the conduit, and typical mineralization thicknesses and orientations. The conduit at the Bridge Zone is essentially flat-lying, as shown in the figure.

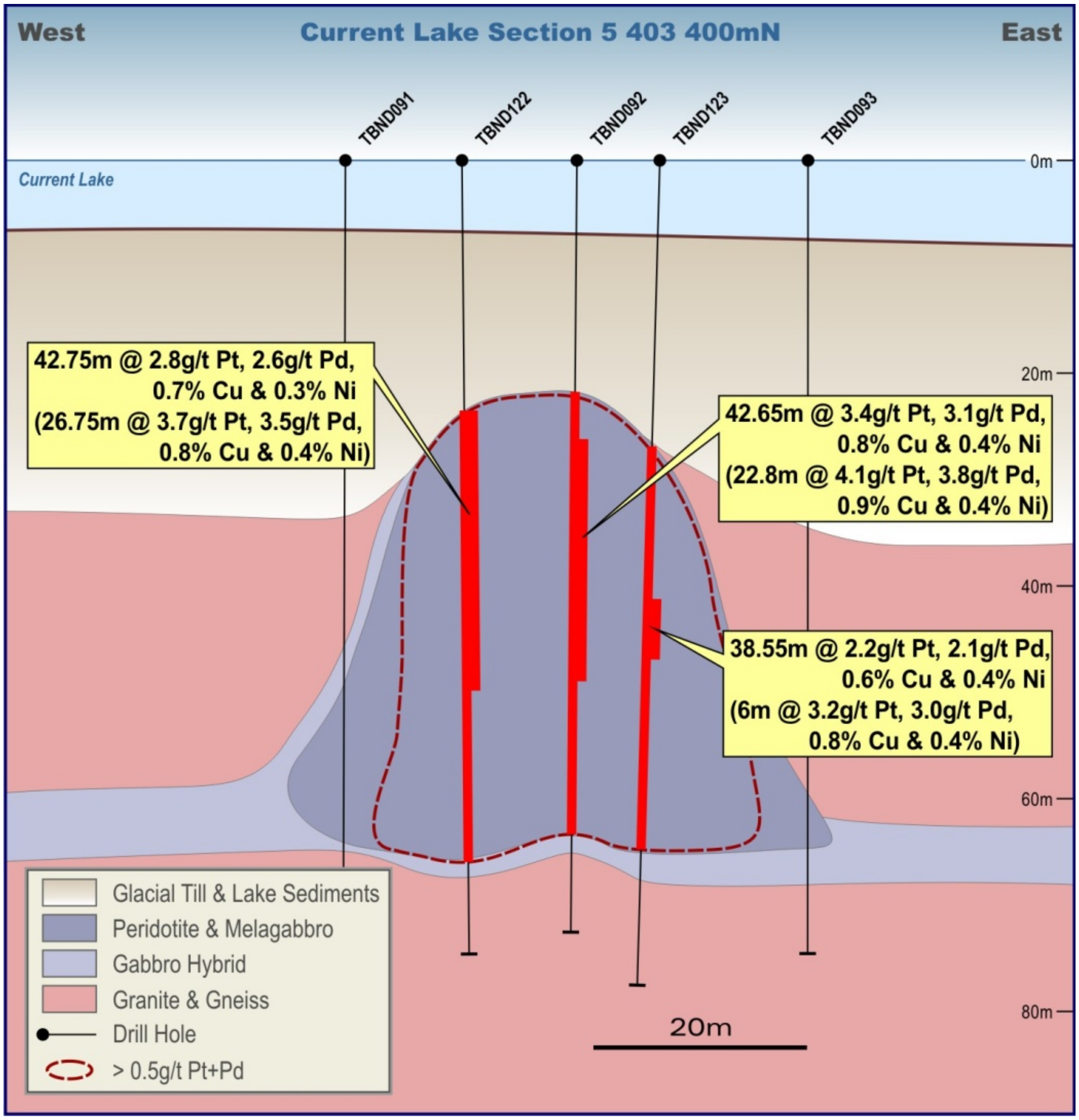
7.3.2 Beaver Lake

Beaver Lake exhibits a shallow (15°) east–southeasterly plunge and is tabular in form. The morphology of the Current Lake Intrusive Complex system changes from tube-like to tabular when it crosses the contact between the granitoid rocks north of the contact, and the metasedimentary rocks south of the contact. Figure 7-8 and Figure 7-9 display the changing shape of the conduit, and typical mineralization thicknesses and orientations. The figures illustrate that at the Beaver Lake zone, mineralization typically occupies basal depressions.

The Beaver Lake zone host intrusion increases from 100 m width and 15 m thickness to 550 m width and 200 m thickness towards the east. Beaver Lake sulphide mineralization is largely hosted by olivine melagabbro; however, significant mineralization can occur within lherzolite, which forms the core of the Beaver Lake Intrusion. The sulphide mineralogy is similar to Current Lake.

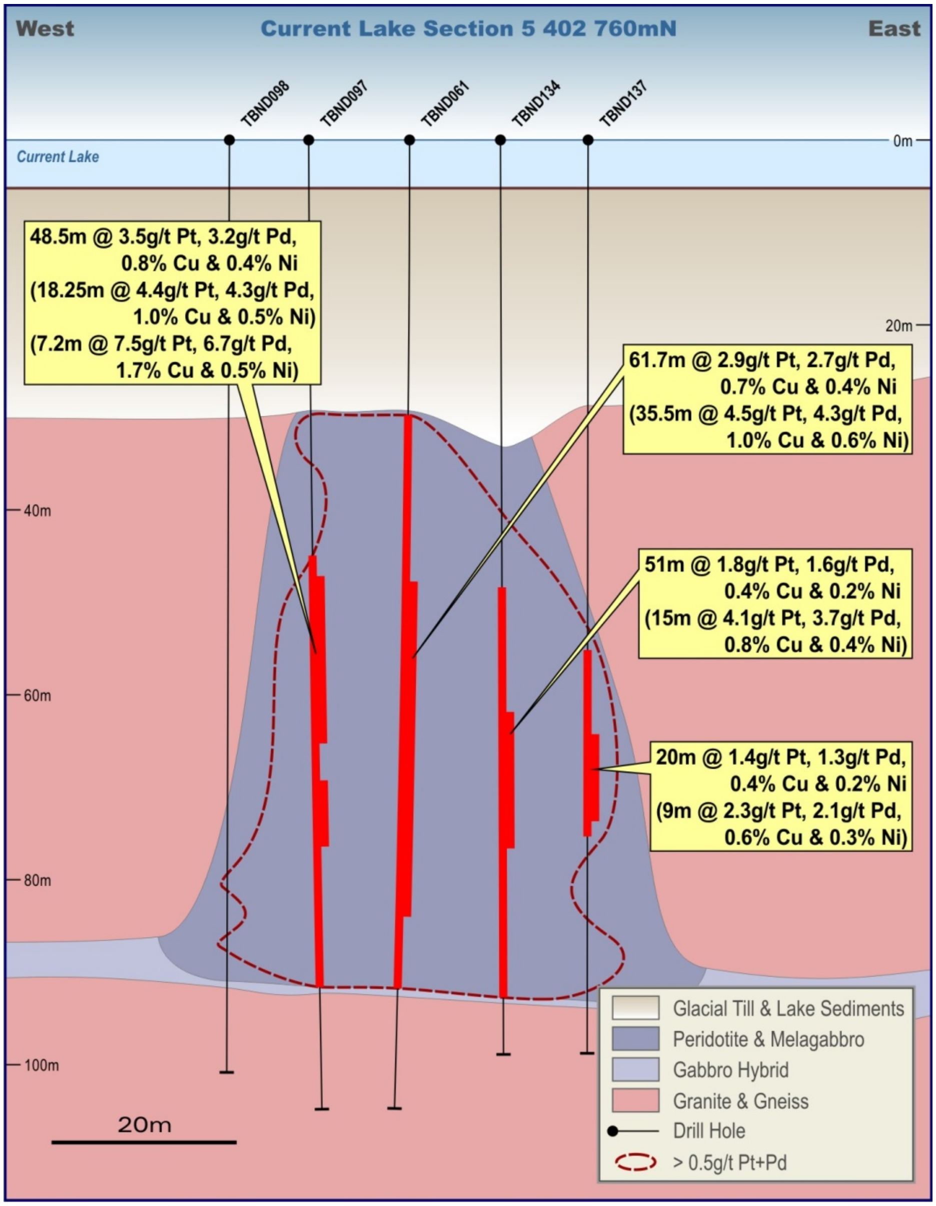
The morphology of the sulphide mineralization at Beaver Lake differs from Current Lake in that the entire conduit is not mineralized. The sulphide mineralization is typically located around the margins of the conduit within the olivine melagabbro and may wrap around the northern margin of the intrusion.

Figure 7-5: Example Drill Section, Current Lake (5403400 mN)



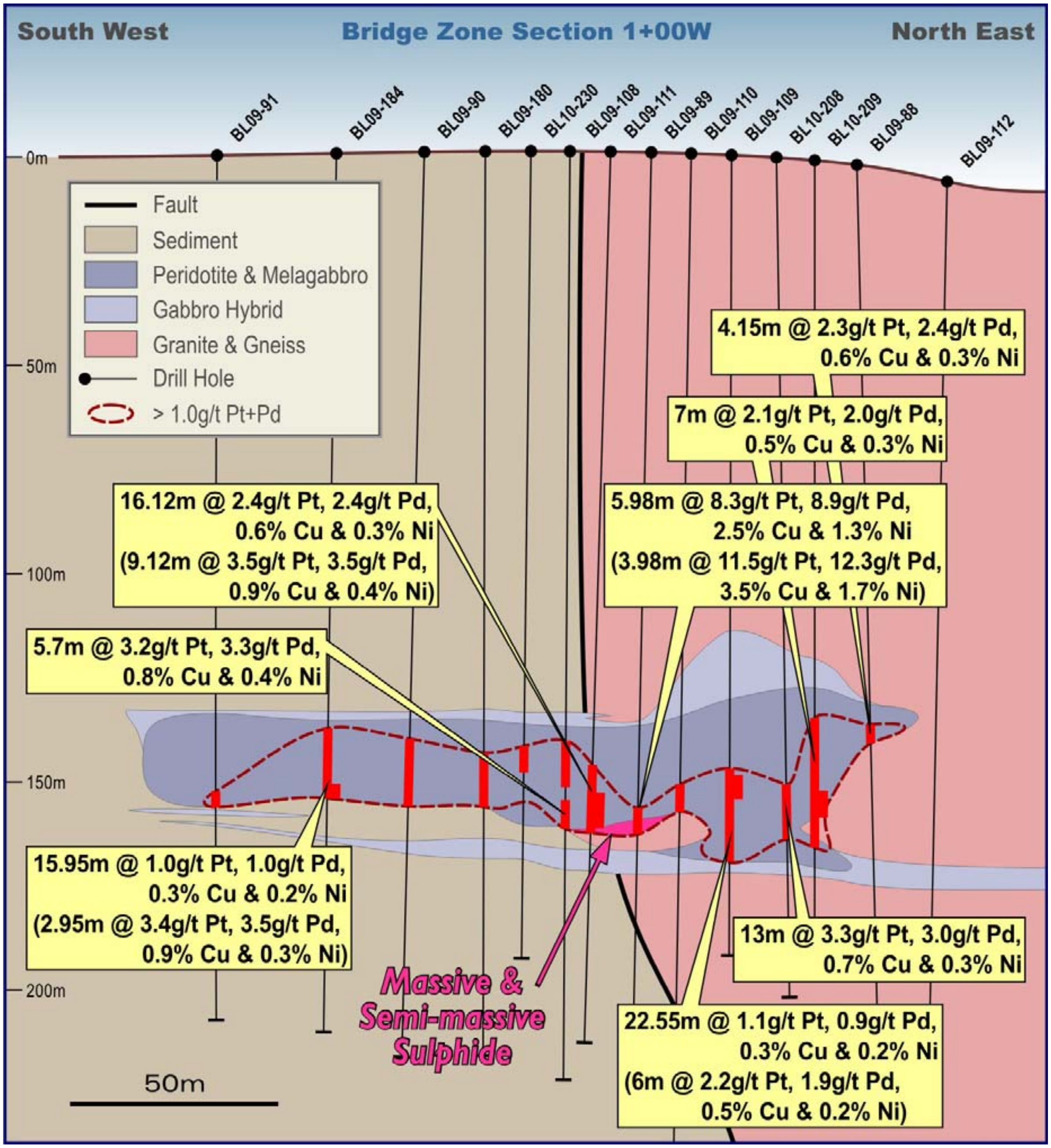
Note: The drill intercept reported for TBND122 commences at 23.25 m vertical depth, that for TBND092 at 21.00 m vertical depth, and that for TBND 123 starts at 27.10 m vertical depth. Because the drill holes are vertical, the drill intercepts approximate the true thickness of mineralization. The 0.5 g/t Pt+Pd is equivalent to 0.25 g/t Pt grade shell used in the resource estimate. Figure courtesy Magma Metals.

Figure 7-6: Example Drill Section, Current Lake (5402760 mN)



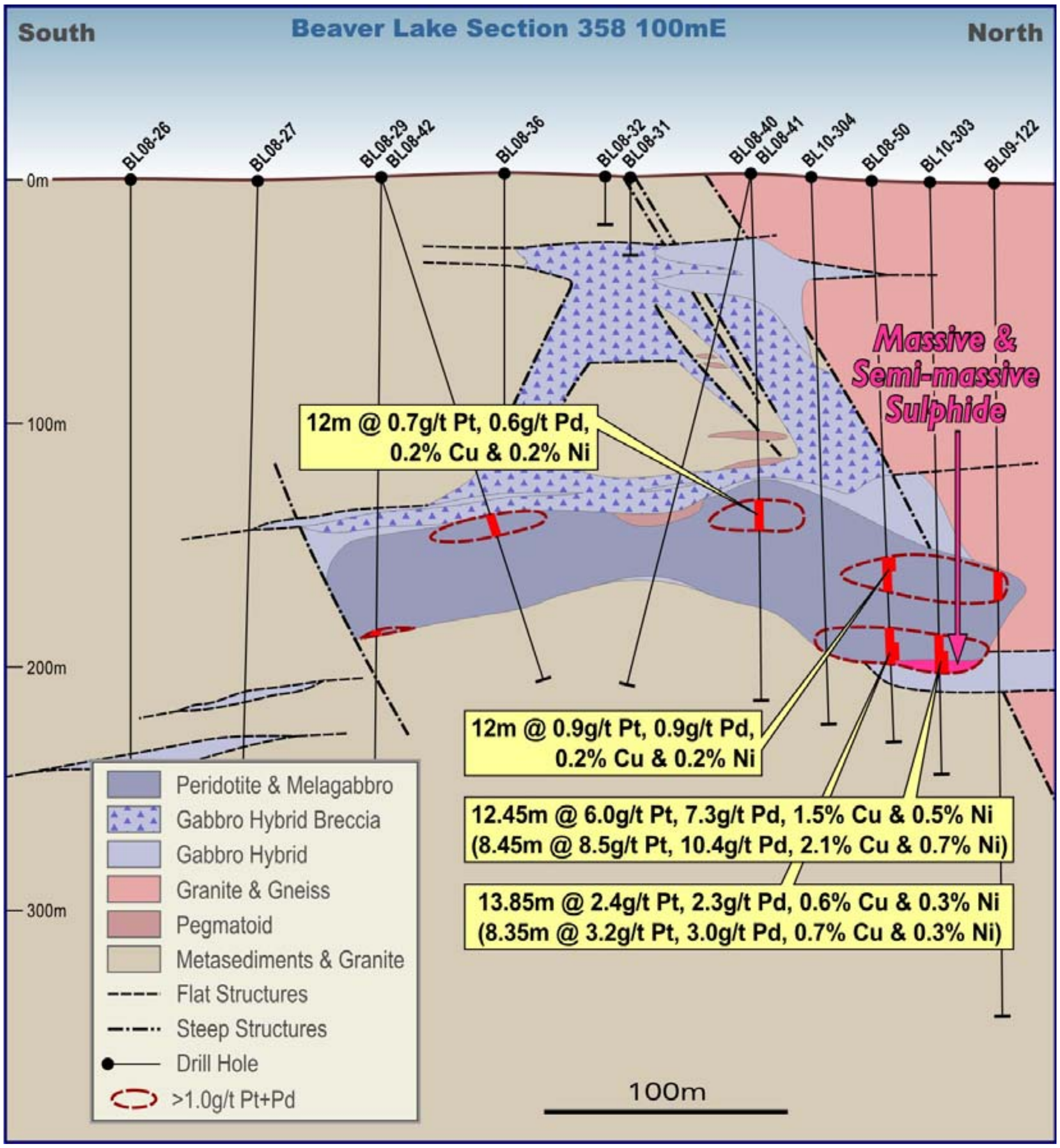
Note: The drill intercept reported for TBND097 commences at 43.30 m vertical depth, that for TBND061 at 29.30 m, and that for TBND134 starts at 55.00 m, and the intercept in TBND137 commences at 56.00 m. Because the drill holes are vertical, the drill intercepts reported approximate the true thickness of mineralization. The 0.5 g/t Pt+Pd is equivalent to 0.25 g/t Pt grade shell used in the resource estimate. Figure courtesy Magma Metals.

Figure 7-7: Example Drill Section, Bridge Zone (100W)



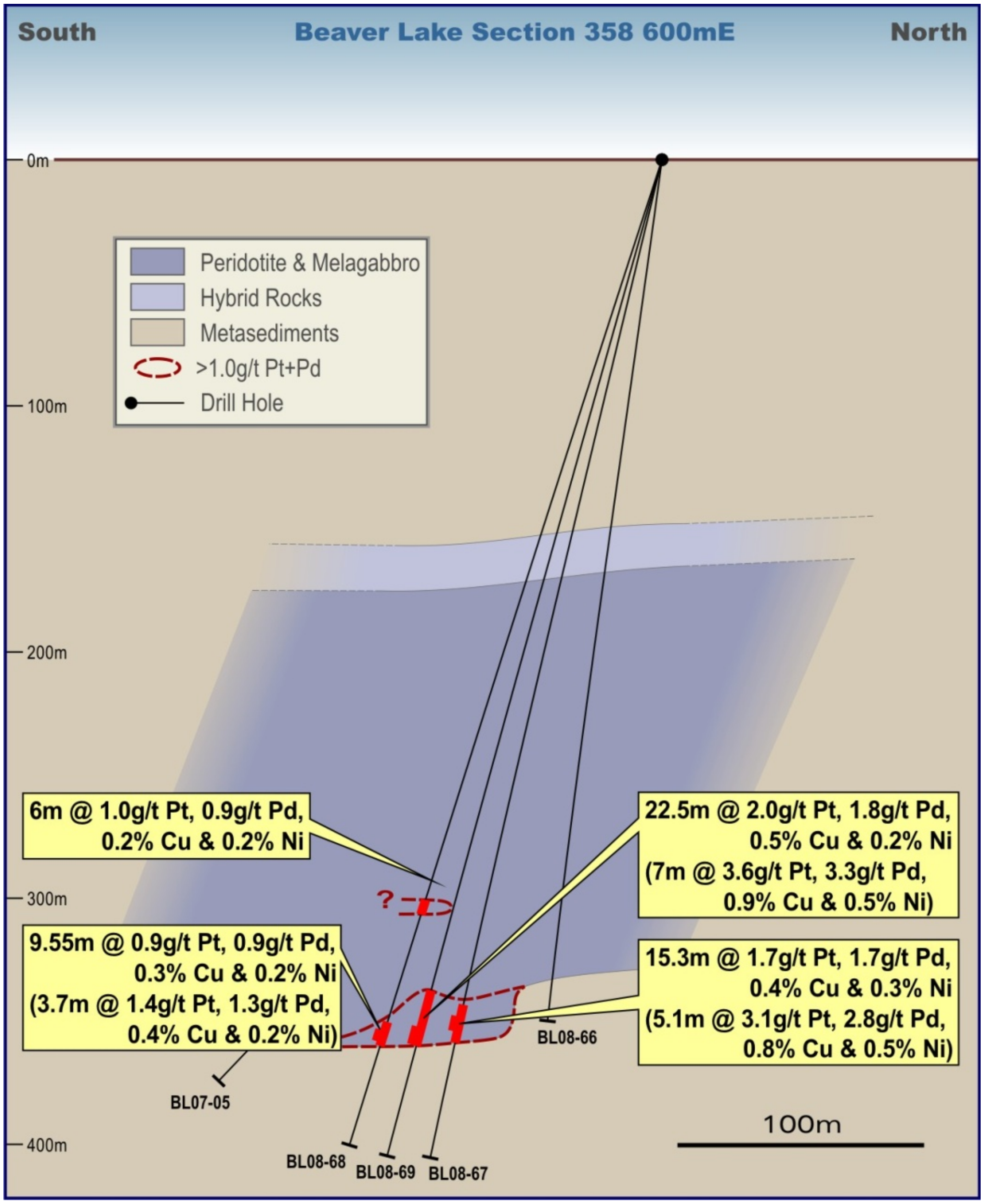
Note: The drill intercept reported for BL09-184 commences at 139.00 m vertical depth, that for BL10-111 at 147.00 m; for BL09-108 starts at 156.00 m; the intercept for BL09-89 starts at 157.25 m; that for BL09-109 at 147.00 m, BL10-208 at 151.00 m, for BL10-209 at 151.00 m and for BL09-88 at 135.00 m. Because the drill holes are vertical, the drill intercept approximates the true thickness of mineralization. The 1 g/t Pt and Pd shell is not the grade shell used to constrain underground mineral resources in Section 17. A smaller, higher grade shell within this was used. Figure courtesy Magma Metals.

Figure 7-8: Example Drill Section, Beaver Lake (358100 mE)



Note: Figure courtesy Magma Metals

Figure 7-9: Example Drill Section, Beaver Lake (358600 mE)



Note: The drill intercept reported for BL08-68 commences at 370.25 m vertical depth, the drill hole was angled at 72.4º; that for BL08-69 at 353.00 m with the drill hole angled at 75.7º; and that for BL08-67 at 355.00 m with the drill hole angled at 77.6º. Drill hole BL08-66 was drilled at an angle of 81.1º. BL07-05 is a 2007 hole that intersects the section obliquely near the base of the intrusion and the drill hole collar is to the northeast of this drill fan. With the exception of BL07-05, these drill holes are drilled from the same set-up as a drill fan, and are drilled at an angle to the mineralization, so the drilled width reported is thicker than the true width. The 1 g/t Pt and Pd shell is not the grade shell used to constrain underground mineral resources in Section 17. A smaller, higher grade shell within this was used. Figure courtesy Magma Metals

Basal mineralization is the most dominant and appears to have thermally eroded into the Quetico Subprovince meta-sedimentary rocks. Typically, mineralization is thickest and highest grade in depressions on the floor of the intrusion. This basal mineralization generally forms a complex mesh of mineralized depressions and varies in thickness from 2 m to as much as 30 m and in widths from 20 m to >50 m. The term “Spine Zone” is a term used by Magma Metals geologists for basal mineralization present within the central Beaver Lake portion of the Current Lake Intrusive Complex.

The sulphide tenor is, in general, consistent in the mineralization along the upper and lower contacts; however, some higher-tenor “cloud” mineralization has been identified along the upper contact of the Beaver Lake Intrusion. This style of mineralization, referred to as the “Cloud Zone”, consists of very finely-disseminated chalcopyrite.

Mineralization within the lherzolite occurs where the upper and lower contact mineralization are thickest, and therefore continues into the lherzolite. Additional mineralization is developed in chromium-rich horizons within the core of the Beaver Lake intrusion. Typically, the olivine melagabbro and lherzolite contains 2,000–3,000 ppm chromium; however, two continuous zones 4,000–5,000 ppm chromium with thicknesses of 2–5 m contain significant sulphide mineralization. Chromite has not been observed in the horizons; however, bright green chlorite is present and may host the chromium.

7.4 Comment on Section 7

In the opinion of the QPs, knowledge of the deposit settings, lithologies, and structural and alteration controls on mineralization is sufficient to support Mineral Resource estimation and preliminary mine planning.

8.0 DEPOSIT TYPES

8.1.1 Magmatic Sulphide Deposits

Magmatic sulphide deposits are sulphide mineral concentrations in mafic and ultramafic rocks derived from immiscible sulphide liquids. When formed, droplets of immiscible sulphide liquid settle through less dense silicate magma. The sulphide liquid acts as a "collector" for cobalt, copper, nickel, and platinum-group elements, because these elements are preferentially concentrated in sulphide liquids at levels 10 times to 100,000 times those in silicate liquids. To a lesser degree, iron is also preferentially partitioned into the sulphide liquid and, because of its greater abundance, most immiscible sulphide liquids are iron-rich.

There are two main subset deposit types of magmatic sulphide deposits: first nickel-copper (PGE) deposit and second PGE deposits. In nickel–copper sulphide deposits, Ni and Cu are the main economic metals. Nickel constitutes the main economic commodity, generally at grades of about 1–3%. Copper may be either a co-product or by-product. Cobalt, PGE, and Au are common by-product metals. This deposit type can be subdivided into four subtypes:

- A meteorite-impact mafic melt sheet that contains basal sulphide ores (Sudbury, Ontario is the only known example)
- Rift and continental flood basalt-associated mafic sills and dyke-like bodies (Noril'sk–Talnakh, Russia; Jinchuan, China; Duluth Complex, Minnesota; Muskox, Nunavut; and Crystal Lake intrusion, Ontario)
- Komatiite (magnesium-rich) ultramafic volcanic flows and related sill-like intrusions (Thompson, Manitoba; Raglan and Marbridge, Quebec; Langmuir, Ontario; Kambalda and Agnew, Australia; Pechenga, Russia; Shangani, Trojan, and Hunter's Road, Zimbabwe)
- Other mafic/ultramafic intrusions (Voisey's Bay, Labrador; Lynn Lake, Manitoba; Giant Mascot, British Columbia; Kotalahti, Finland; Råna, Norway; and Selebi-Phikwe, Botswana).

The second major deposit type is PGE-rich, with the PGE elements associated with sparsely dispersed sulphides in very large to medium-sized, typically mafic/ultramafic layered intrusions.

PGE deposits are hosted in many different geological settings, including:

- Deformed greenstone belts and calc-alkaline batholiths associated with convergent plate margins
- Ophiolite complexes that formed at constructive plate margins
- Intraplate magmatic provinces associated with flood-basalt type magmatism
- Passively rifted continental margins.

Host rocks are predominantly mafic to ultramafic igneous rocks. Significant amounts of ore are located in footwall country rocks of diverse meta-sedimentary or meta-igneous origin and composition.

Some Ni–Cu–PGE deposits occur as individual sulphide bodies associated with magmatic mafic and/or ultramafic bodies. Others occur as groups of sulphide bodies associated with one or more related magmatic bodies in areas or belts up to tens, even hundreds, of kilometres long.

Magmatic sulphide ore is typically associated with:

- Abrupt variations in the cumulus-mineral succession, including major lithological changes, reversals or changes in crystallization order, discontinuities in mineral fractionation patterns and cyclic units
- Rocks near the lower contact of an intrusion that may contain country rock xenoliths and be characterized by irregular variations in grain size, mineralogy, and texture,
- Rocks near the base of an ultramafic volcanic flow
- Pegmatoids and rocks enriched in minerals that crystallize late from silicate magmas.

Deformation and alteration can remobilize sulphide minerals into breccia ore and segregate sulphide minerals into fractures, cleavage planes, and veins. Remobilized sulphide mineral assemblages may be copper-rich relative to sulphide-mineral assemblages that are not remobilized. Sulphide mineral assemblages that appear to have precipitated from fluids moving through fault zones or along joint surfaces are dominated by pyrite.

Sulphide mineral assemblages, which are dominated by pyrrhotite, pentlandite and chalcopyrite, result from solid-state recrystallization of high-temperature sulphide minerals. The proportions of these three minerals are determined by the initial bulk composition of the immiscible sulphide liquid. The sulphide mineral content of these ore deposits varies from <10% to >60%. Nickel grades are typically between 0.7-3.0%, and Cu grades are between 0.2–2.0%.

Magnetite is commonly intergrown with the sulphide minerals. Minor phases include platinum-group-element minerals (sulphide, arsenide, telluride, antimonide and alloy phases), nickel- and cobalt-bearing arsenide minerals (for example gersdorffite), galena, and sphalerite and gold, silver, and lead telluride minerals.

Sulphide minerals may be concentrated in structurally low areas at the base of intrusions or flows or may be in zones where silicate magma interacted with xenoliths. Sulphide mineral concentrations in layered, cumulate sequences may be related to major lithological features such as cyclic-unit boundaries, unconformities, chromite seams, pegmatoids or stratigraphic intervals characterized by major changes or discontinuities in cumulus minerals.

The location of sulphide concentrations in conduits at Talnakh–Noril'sk and Voisey's Bay, and near conduits in particular komatiitic deposits, suggests that sulphides accumulated where the flow rate of magma was reduced and the entrained sulphides settled gravitationally to form rich basal concentrations.

Gangue mineralogy is the same as that of the host rock and consists primarily of plagioclase, orthopyroxene, clinopyroxene and olivine. Minor secondary phases are serpentine minerals, talc, magnetite, calcite, epidote, sericite, actinolite, chlorite, tremolite and clay minerals.

8.1.2 Mineralization Developed within Rift and Flood Basalts

Specific features of sulphide mineralization developed within rift and flood basalts (Noril'sk type; Naldrett, 2004) include:

- A large volume of relatively primitive magma (Mg number circa 0.55), including olivine-phyric magma; some flows can be picritic. At Noril'sk, there is a lower contact gabbro–dolerite marginal zone, overlain by a zone of plagioclase- and sulphide-rich taxitic gabbro–dolerite, and overlain in turn by picritic gabbro–dolerite. An intrusive breccia comprising assimilated country rock fragments in a gabbro matrix may be present in the roofs of some intrusions
- An intrusive environment in which the magma has had the opportunity to thermally erode/react with the surrounding country rocks
- Sulphides located in areas that have provided the principal conduits for magma flow. Conduits developed as magma feeding the sills became concentrated along

particular zones; the concentration of this flow resulted in thermal enlarging of the channel ways by erosion of the surrounding rock

- Country rocks can display well-developed metamorphic aureoles
- A magma flow that has already developed immiscible sulphides. This enables changes in fluid flow dynamics to cause deposition of sulphides in hydrodynamic traps within the flow channel
- Potential exposure of the sulphides to subsequent batches of magma using the same conduit as the batch from which the sulphides segregated initially
- Evidence of chalcophilic depletion in the magma
- A source of sulphur in the country rocks
- A structural setting which exposes the intrusions feeding the lavas. Intrusions can be very shallow, forming chonoliths
- Feeder conduits can be closely related to regional-scale faults.

Based on a summary prepared by Kunilov (1994), disseminated sulphide mineralization in such deposits typically occurs as droplets, schleiren and fine sulphide veinlets. Disseminated sulphides can form sheet-like conformable bodies and consist of combinations of chalcopyrite, cubanite and pyrrhotite with troilite and pentlandite. At the Norilsk, grades average 0.5 to 0.6% Ni, 0.6 to 0.7% Cu, and 5–6 g/t PGE (Porter Geoconsultancy, 2010) for deposits within taxitic and gabbro–dolerite rocks.

Massive sulphide mineralization typically consists of pyrrhotite, cubanite or chalcopyrite types, depending on the dominant sulphide, with associated pentlandite, mooihoekite, and talnakhite (Kunilov, 1994). Grades are dependent on the sulphide types present, and can typically vary considerably between types. At the Noril'sk deposits, grades average 2.8% Ni, 5.6% Cu and 15 g/t PGE (Porter Geoconsultancy, 2010). Massive sulphides at Noril'sk typically form in either the lowermost portions of the intrusions, or immediately underlying them.

Some deposits display evidence that the massive sulphides post-date the disseminated sulphides (Kunilov, 1994).

Norilsk deposits are typically associated with a very high proportion of sulphides (2-10 wt% by total mass), and these sulphides contain a significant concentrations of PGE.

8.1.3 Features of the Current Lake and Beaver Lake Deposits

Features that lead to classification of the Current Lake and Beaver Lake deposits as nickel–copper sulphide deposits, in particular part of the sub-class of such deposits that are associated with rift and flood basalts (Noril'sk type), are listed as follows:

- Spatial and genetic relationship with a Large Igneous Province. Deposits are hosted in the Current Lake Intrusive Complex; a series of magmatic conduits of Keweenawan age that formed along a failed rift related to the Nipigon Embayment and are part of the Mid-continent Rift system
- Presence of taxitic rocks
- Contact metamorphism of the country rocks
- Chonolith host units. Mineralization developed in flattened tubes (conduits) which are feeders to larger igneous intrusions
- Basalt parental magma composition
- High sulphide grades
- Enriched in PGE
- Sulphides are likely derived by contamination of the magma through incorporation of sulphur from adjoining wall rocks
- Sulphides tended to settle gravitationally, and collect in the conduits at points where magma velocity was reduced, such as within basal embayments
- Typical form of the sulphides as disseminated millimetre to centimetre-size spheres dispersed through the host melagabbro.

9.0 MINERALIZATION

9.1 Current Lake and Bridge Zones

In general, within the Current Lake and Bridge Zones, sulphide mineralization is disseminated, ranging from a few percent to >25% sulphides.

Disseminated sulphide grains can range in size from 0.5 mm to as much as 1 cm in size and consist of pyrrhotite, chalcopyrite, pentlandite, minor pyrite and rare cubanite and violarite.

Basal net-textured (25–50%) sulphide and massive sulphide intervals have been intersected in core drilling locally and are more common in the Bridge Zone than the Current Lake Zone. In both of these zones the main concentrations of mineralization occur as elongated high-grade pods connected by narrower medium- to low-grade zones.

Significant massive sulphide veins, generally 1–2 cm wide, occur within the Current Lake Zone. These veins are typically either sub-horizontal or near-vertical, and are interpreted by Magma Metals geologists to be the result of segregation of molten massive sulphide during the cooling of the intrusion. Plagioclase occurs in these veins, which indicates that plagioclase had also not yet crystallized completely and was still partially molten.

9.2 Beaver Lake Zone

The Beaver Lake sulphide mineralization is disseminated, ranging from a few percent to >25% sulphides, and is also interstitial to the silicate gangue. Disseminations can range in size from 0.5 mm to as much as 1 cm in size. Blebby sulphides are common and classic net-textured and massive sulphide mineralization has been intersected regularly in core drilling within the western portions of the Beaver Lake Zone, particularly where it merges with the Bridge Zone.

In the Beaver Lake Zone, sulphide grades are generally consistent between the mineralization along the upper and lower contacts. However, the Cloud Zone generally has higher-tenor mineralization. The basal mineralization, particularly the western and “Spine” areas, forms a complex mesh of mineralized subzones that occur in depressions on the floor of the intrusion. These intersecting depressions appear to coincide with conjugate fracture sets within the underlying Archean meta-sedimentary rocks and may have formed by thermal erosion along the structurally-weakened fracture zones.

9.3 Petrography

Preliminary assessments of the PGE mineralogy were undertaken by SGS Lakefield.

SGS Lakefield analyzed the mineralogy of boulder samples found at the surface. From this analysis the dominant PGE minerals are moncheite ($PtTe_2$) and michenerite (PdBiTe) with smaller amounts of platarsite (PtAsS). The size of the platinum group mineral (PGM) grains in the SGS Lakefield study ranged from 2–112 µm, with the majority in the 2–5 µm size range. The PGM were reported to be contained largely within the sulphide phases.

Petrographic analyses performed on metallurgical samples indicated the presence of sperrylite ($PtAs_2$).

9.4 Minor PGE Elements

SGS Lakefield has also undertaken PGE analyses to test for the platinum-group elements Pt, Pd, ruthenium (Ru), rhodium (Rh), iridium (Ir), and osmium (Os), (collectively the 6-PGE group) in the sulphide mineralization. Initial 6-PGE analyses indicated there was potential for concentrations of Ru, Rh, Ir, and Os, (collectively referred to as the “minor PGEs”) in the sulphide mineralization.

Subsequently, analyses by Ultratrace Laboratories (Perth) that currently total 1,035 determinations were performed on a broader range of samples. These analyses confirmed the presence of the minor PGEs in both deposits.

9.4.1 Metal Ratios

Work completed by Dr. Roland Goodgame in 2010, in association with Magma Metals geological staff, indicated that copper to nickel ratios are typically 1.4:1 to 2.0:1 and vary depending on the proportion of sulphide nickel present. Platinum to palladium ratios are generally of the order of 1.07:1 (Goodgame, 2010).

9.5 Comment on Section 9

In the opinion of the QPs, the understanding of mineralization types and settings are acceptable to support Mineral Resource estimation.

10.0 EXPLORATION

Magma Metals commenced exploration on the Project in 2005 subsequent to the signing of the option agreement. Exploration has primarily been undertaken by Magma Metals (e.g. geological mapping), or by contractors (e.g. airborne geophysical surveys, hydrological surveys, and geotechnical studies).

A summary of all work completed to date is included as Table 10-1.

10.1 Grids and Surveys

A 235 km^2 LIDAR survey was conducted by Terrapoint Inc. of Ottawa, ON in 2009. The survey used UTM NAD83 Zone 16 as a reference. The topographic model is accurate to a 1 m (x, y, z) grid, and is considered sufficiently accurate for resource modelling purposes and to support Preliminary Assessment-level studies.

No other topographic surveys have been undertaken. All previous digital base-maps were constructed using the publicly available 1:20,000 scale Ontario Basemap Series (OBM) data and the National Topographic System (NTS) 1:50,000 scale data.

All drill collar surveys are reported using UTM NAD83 Zone 16 co-ordinates.

Bathymetric surveys were performed by Magma Metals staff in 2008, over Current Lake and Steepledge Lake, using a boat equipped with sonar unit, and a differential global positioning system (GPS) instrument for reading locations. Sonar lines were spaced at approximate 15 m to 20 m, and had a similar accuracy range; the survey is considered sufficiently accurate to support Preliminary Assessment-level studies.

10.2 Geological Mapping

During 2006, a surface reconnaissance geological mapping program was undertaken. This program better defined two clusters of ultramafic boulders that contained PGE and copper nickel mineralization on the shores of Current Lake that were originally discovered during prospecting activities in 2001 (west shore boulders) and in 2006 (east shore boulders). The east shore boulders are considered by Magma Metals staff to have undergone only minor movement by glacial ice and are interpreted to be essentially in-situ. The west shore boulders are interpreted to have been transported at least 200 m to the southwest by glacial ice.

Table 10-1: Exploration Summary Table

Activity	Duration Date	Performed by
2006		
Prospecting, Geological Mapping, Petrography	14/05/2006–17/05/2006	G. Wilson
Helicopter-borne Magnetic/Radiometric Survey	07/07/2006–11/07/2006	McPhar Geosurveys
Phase 1 Current Lake Diamond Drilling (DD), 6 core holes (1,590.5 m)	08/12/2006–04/04/2006	G. Wilson
2007		
Helicopter-borne VTEM Survey	27/02/2007–03/03/2007	Geotech Limited
IP/Resistivity Survey	09/03/2007–18/03/2007	Abitibi Geophysique
Phase 2 Current Lake DD, 28 holes (3,078.3 m)	16/04/2007–21/10/2007	G. Wilson, J. Johnson
Phase 1 Beaver Lake DD, 1 core hole, (500 m)	04/09/2007–21/09/2007	J. Johnson
Boat Magnetic Surveys	05/07/2007–06/07/2007	Mtec Geophysics
Phase 2 Beaver Lake DD, 6 core holes (2,014.5 m); includes first Lone Island Lake drill hole	22/11/2007–14/12/2007	J. Johnson, G. Wilson
Borehole Pulse EM Survey	10/12/2007–21/12/2007	Crone Geophysics & Exploration Ltd.
2008		
Drill Core Physical Property Tests	12/01/2008–13/01/2008	Southern Geoscience Consultants
Borehole Pulse EM Survey	22/01/2008–02/02/2008	Crone Geophysics & Exploration Ltd.
Phase 3 Current Lake Ice DD, 23 core holes (1,834 m)	21/02/2008–16/03/2008	J. Johnson, G. Wilson
Resistivity/IP Survey	21/02/2008–13/03/2008	Abitibi Geophysique
Phase 3 Beaver Lake DD, 26 core holes (8,008.5 m)	11/02/2008–26/06/2008	J. Johnson, G. Wilson
TBNP Airborne Magnetic Survey	03/03/2008–05/03/2008	Aeroquest Limited
Petrography and Mineralogy	09/03/2008–12/03/2008	G. Wilson
Regional Airborne Magnetic Survey	07/05/2008–15/05/2008	Aeroquest Limited
Phase 4 Current Lake Barge DD, 67 core holes (5,571.5 m)	23/06/2008–08/11/2008	J. Johnson, G. Wilson, J. Harris, S.Franko, R. Khoun
Phase 4 Beaver Lake DD, 40 core holes (13,089.7 m)	29/06/2008–19/12/2008	J. Johnson, G. Wilson, R. Khoun, S, Franko
Boat Magnetic Surveys, Current and Steepledge Lakes	08/08/2008–09/08/2009	Mtec Geophysics
Petrography and Mineralogy	06/09/2008–10/09/2008	G. Wilson
Petrology and Lithogeochemistry	15/09/2009–19/09/2008	R. Sproule, GeoDiscovery Group
Geological Mapping	12/10/2008–27/10/2009	G. Wilson
Reconnaissance DD 7 core holes (2,765 m); drilling completed at Southeast Anomaly, Steepledge, and Lone Island Lake areas	17/10/2008–13/12/2008	J. Johnson, G. Wilson, S.Franko, R. Khoun
Structural Study	10/11/2008–13/11/2008	B. Hrabi, SRK Consulting Ltd.
2009		
Phase 5 Current Lake Ice DD, 86 core holes, (6726 m)	23/01/2009–24/03/2009	S. Franko, J. Johnson
Lake Ice Magnetic Survey, Steepledge Lake	25/02/2009–26/02/2009	Mtec Geophysics
Helicopter-borne VTEM Survey	15/02/2009–23/02/2009	Geotech Limited
Helicopter-borne Follow-up VTEM Survey	28/03/2009	Geotech Limited
Fixed Loop TEM Survey, Current Lake	05/03/2009–17/03/2009	Crone Geophysics & Exploration Ltd.
HT SQUID Fixed-Loop TEM Survey	10/03/2009–21/03/2009	Crone Geophysics & Exploration Ltd.

Activity	Duration Date	Performed by
Phase 5 Beaver Lake DD, 38 core holes, (7989.5 m)	24/03/2009–20/06/2009	S. Franko, J. Johnson
Borehole Pulse EM Survey	22/03/2009–09/04/2009	Crone Geophysics & Exploration Ltd.
Geological Mapping	26/05/2009–26/10/2009	G. Wilson, S. Halet, R. MacDiarmid
Phase 6 Beaver Lake DD, 45 core holes (12,460.8 m)	21/06/2009–31/10/2009	J. Johnson, K. Nakano, R. Weston
Borehole Pulse EM Surveys	03/06/2009–23/06/2009	Crone Geophysics & Exploration Ltd.
Phase 1 Steepledge Lake Barge DD, 32 core holes, (6,212 m)	24/06/2009–07/10/2009	S. Franko, R. Weston, J. Johnson
Borehole MMR Test Surveys	01/04/2009–30/06/2009	Crone Geophysics & Exploration Ltd.
Borehole Pulse EM Surveys	25/07/2009–08/08/2009	Crone Geophysics & Exploration Ltd.
Borehole Pulse EM Surveys	25/08/2009–02/09/2009	Crone Geophysics & Exploration Ltd.
Test HMC Geochemistry Survey	20/09/2009–28/09/2009	R. Weston, K. Nakano
Test Lake Sediment Geochemistry Survey	07/10/2009–19/10/2009	R. Weston, G. DeRozea
Phase 2 Steepledge Lake Helicopter DD, 7 core holes, (2,217 m)	15/10/2009–10/12/2009	S. Franko, R. Weston, J. Johnson
Geophysical Data Review	20/10/2009–13/11/2009	W. Hughes, WHEM Consulting
Borehole Pulse EM Surveys	25/10/2009–04/11/2009	Crone Geophysics & Exploration Ltd.
Phase 7 Beaver Lake DD, 22 core holes, (4,195.5 m)	01/11/2009–17/12/2009	K. Nakano, R. Weston, J. Johnson
2010		
Lithogeochemistry Study	12/01/2010–02/07/2010	V. R. Goodgame, Taloumba Inc.
Phase 8 Beaver Lake DD, 128 core holes, (30,519.5 m)	16/01/2010–27/04/2010	J. Johnson, R. Weston, K. Nakano, P. Gann, R. Easterbrook, H. Pintson
Borehole Pulse EM Surveys	19/01/2010–17/02/2010	Crone Geophysics & Exploration Ltd.
Phase 3 Steepledge Lake DD, 14 core holes, (2,242 m)	14/02/2010–14/03/2010	R. Weston, G. Wilson, J. Johnson
Borehole MMR Survey	18/02/2010–26/03/2010	Crone Geophysics & Exploration Ltd.
Moving Loop/Fixed Loop Ground EM Surveys	23/03/2010–10/05/2010	Crone Geophysics & Exploration Ltd.
Cesium Vapour Ground Magnetic Survey	27/03/2010–18/04/2010	Crone Geophysics & Exploration Ltd.
Borehole Physical Rock Properties Survey	20/02/2010–03/03/2010	DGI Geoscience Inc.
Borehole Pulse EM Surveys	11/05/2010–08/06/2010	Crone Geophysics & Exploration Ltd.
Gravity Ground Survey	12/05/2010–21/05/2010	Eastern Geophysics Ltd.
Current Lake Follow-up DD, 4 core holes, (661 m)	28/04/2010–13/06/2010	J. Johnson, L. Dolanski
Lone Island Lake Reconnaissance DD, 12 core holes (4,249.5 m)	06/05/2010–21/07/2010	J. Johnson, J. Dumas, P. Gann, R. Easterbrook
Phase 9 Beaver Lake DD, 28 core holes, (5,843.9 m)	07/05/2010–21/07/2010	J. Johnson, P. Gann, J. Dumas, L. Dolansky
Phase 1 Greenwich Lake (SEA) DD, 5 core holes, (1,429 m)	06/06/2010–29/07/2010	J. Johnson, G. Heggie, L. Dolansky
Cesium Vapour Ground Magnetic Survey	09/06/2010–14/07/2010	Crone Geophysics & Exploration Ltd.
Gravity Ground Survey	03/07/2010–18/07/2010	Eastern Geophysics Limited
HMC Geochemistry Survey	17/06/2010-02/09/2010	R. Weston, M. Deller, P. Drost, J. Dumas
Lake Sediment Geochemistry Survey	03/08/2010-24/09/2010	R. Weston, M. Deller, P. Drost, J. Martin, J Dumas
Falcon Airborne Gravity Gradiometer Survey	14/08/2010–27/08/2010	Fugro Airborne Surveys
Borehole Pulse EM and 3-axis Magnetic Survey	23/08/2010–03/09/2010	Crone Geophysics & Exploration Ltd.
Surface MMR test survey		Crone Geophysics & Exploration Ltd.

Activity	Duration Date	Performed by
UTEM Induced Source Resistivity (ISR) Test Survey	30/09/2010-09/10/2010	Lamontagne Geophysics Limited
Sulphide Fractionation Study	01/10/2010-21/12/2010	A.E. Beswick
Phase 10 Beaver Lake DD; 37 core holes (8,853 m)	08/09/2010-14/12/2010	L. Dolansky, J. Dumas, G. Heggie
Gravity Follow-up DD, 2 core holes (2,229 m)	09/09/2010-21/11/2010	G. Heggie, J. Dumas, J. Johnson
Borehole Pulse EM Survey	08/12/2010-19/12/2010	Crone Geophysics & Exploration Ltd
Airborne Magnetometer and Radiometric Survey	14/12/2010-28/12/2010	Aeroquest Limited
2011		
Thunder Bay North Property Reconnaissance DD, in progress	18/01/2011-Present	J. Johnson, G.Heggie, R. Weston, J. Dumas, L. Dolansky, R. Smart
Borehole Pulse EM Survey	09/01/2011-22/01/2011	Crone Geophysics & Exploration Ltd.
Borehole Pulse EM Survey, In progress for use with active core drill rigs	23/01/2011-Present	Crone Geophysics & Exploration Ltd.
M.Sc. Study of Current Lake Intrusive Complex Hybrid Rocks	Commenced and ongoing	M. Chaffee, University of Minnesota Duluth and Lakehead University
Sulphur Isotope Analyses of Beaver Lake Zone mineralization	January 2011	E. Ripley, Indiana University
Cesium Vapour Ground Magnetic Surveys	01/02/2011-11/03/2011	Crone Geophysics & Exploration Ltd.
Gravity Ground Survey	07/02/2011-13/03/2011	Eastern Geophysics Limited

Reconnaissance geological mapping of the Beaver Lake area and the eastern portion of the Current Lake area was completed during October 2008 by Dr. G.C. Wilson of Turnstone Geological Services Ltd. This program was completed as an initial phase of a regional mapping program planned for 2009.

Mapping was completed at a scale of 1:5,000 and documented most of the Archean-age granitoid and meta-sedimentary rock outcrops in the vicinity of the known mineral deposits underlying Current and Beaver Lakes.

The 1:5,000 scale regional geological mapping program was completed by Dr. Wilson of Turnstone Geological Services Limited over the central Project area between May and October 2009. This program also targeted and examined any existing surface exposures associated within known airborne magnetic anomalies. No additional boulder exposures of Keweenawan-age mafic to ultramafic intrusive rocks were observed; however, several localized exposures of intermediate–hybrid intrusive rocks were observed.

Regional reconnaissance prospecting and geological mapping that targeted previously unexamined magnetic anomalies was completed by Magma Metals staff at a scale of 1:5,000 in the Hicks and Greenwich Lake areas during 2010. Maps are currently in preparation.

10.3 Geochemical Surveys

Geochemical sampling as part of the assessment of the boulder clusters at Current Lake was performed in 2005. Rock chip samples from the boulders returned anomalous Ni, Cu, and PGE elements. The values were sufficiently encouraging to warrant the first of the airborne geophysical surveys over the Project being performed.

During 2009, Magma Metals completed a pilot program to test the efficacy of heavy mineral content (HMC) sampling, where such materials occurred on lake-side beaches within the Project area. A test lake sediment survey, based on samples of organic materials taken from lake bottoms within the Project area, was also trialled. Results were sufficiently encouraging for Magma Metals to plan a systematic program of HMC and lake sediment sampling for late 2010.

During the more detailed 2010 HMC sampling program, a total of 49 samples were collected along the shores of various lakes throughout the property. For the more detailed 2010 lake sediment survey, a total of 106 samples were collected from various lakes throughout the property. Sample results from both programs were sufficiently encouraging to continue the program during the 2011 field season.

10.4 Geophysical Surveys

A significant number of airborne and ground-based geophysical surveys have been completed between 2006 and 2010. Several of the planned 2011 surveys were completed at the Report effective date. Surveys completed on the Project are summarized in Table 10-2. Locations of the airborne surveys are shown in Figure 10-2, whereas Figure 10-3 shows the locations of the areas that were subject to ground geophysical surveys.

10.5 Drilling

Drilling on the Project is discussed in Section 11 of this Report.

10.6 Bulk Density

Bulk density determinations are discussed in Section 12 of this Report.

Table 10-2: Geophysical Survey Summary Table

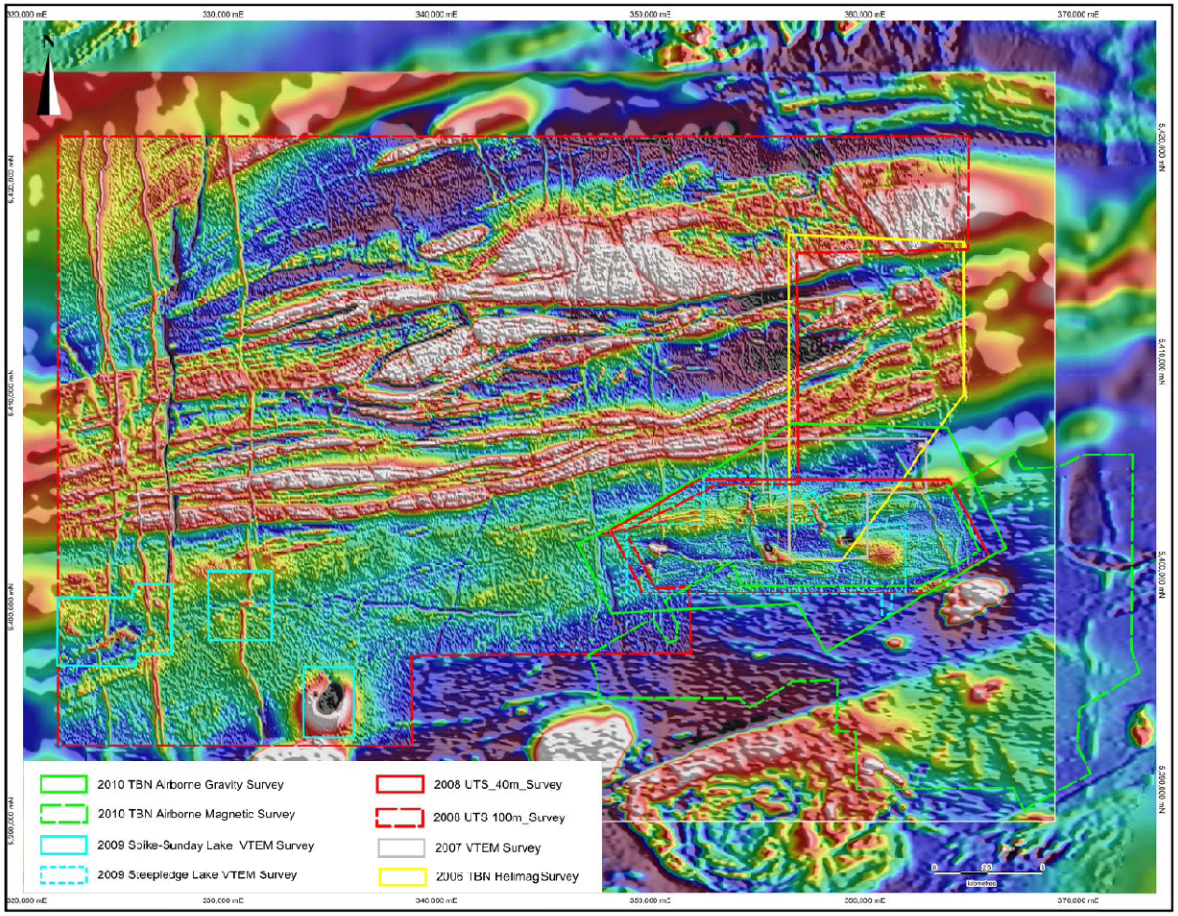
Year	Survey Type	Survey Details	Contractor	Comments/Results
2006	Helicopter-borne magnetic/radiometric survey	100 km^2, 1116 line-km, 100 m spacing; 22 km^2, 826 line-km (Tib Lake), 50 m sensor height	McPhar Geosurveys	Defined Current Lake and Beaver Lake anomalies, north-south oriented lines; Note the Tib Lake option was dropped by Magma in late 2007 and is not part of the current Project area
2007	Helicopter-borne VTEM survey	30.6 km^2, 247 line-km, 100 m spacing; 60 m mag and 33 m EM sensor heights	Geotech Limited	Defined 3 moderate late-time anomalies coincident with magnetic anomalies
	Gradient and pole-dipole ip/resistivity surveys	21 line-km gradient, 13.3 line-km pole-dipole, variable spacing	Abitibi Geophysique	10 variable strength chargeability anomalies identified
	Boat magnetic survey, Current Lake	~25 m line-spacing, continuous readings	Mtec Geophysics	Defined Current Lake anomaly at high resolution
	Bore hole pulse EM survey	3 Phase 1 and 2 Beaver Lake holes surveyed	Crone Geophysics & Exploration Ltd.	1 moderate, 3 weak mid-time anomalies defined
2008	Drill core physical property tests	3 oriented core samples, BL07-05	Southern Geoscience Consultants	Defined remnant magnetism and rock density
	Bore hole pulse EM survey	3 Phase 1 Current Lake holes surveyed	Crone Geophysics & Exploration Ltd.	5 weak to moderate, early- to late-time anomalies identified
	Gradient and pole-dipole resistivity/IP surveys	32.2 line-km gradient, 100 m spacing; 15.9 line-km pole-dipole, variable spacing	Abitibi Geophysique	15 chargeability anomaly trends were identified (12 pole-dipole, 3 gradient)
	Project-wide airborne magnetic survey	78.5 km^2, 2205 line-km, 40 m spacing; 30 m sensor height	UTS/Aeroquest Limited	Defined the magnetic signature of the central TBNP at high resolution; detected the previously unknown Steepledge Lake anomaly
	Regional airborne magnetic survey	874 km^2, 9901 line-km, 100 m spacing 47 m sensor height	UTS/Aeroquest Limited	Identified several regional magnetic anomalies worthy of staking
	Boat magnetic surveys, Current and Steepledge Lakes	~25 m line-spacing, continuous readings	Mtec Geophysics	Defined the Steepledge Lake anomaly; defined extensions of Current Lake magnetic anomaly
2009	Lake ice magnetic survey, Steepledge Lake	~25 m line-spacing, continuous readings	Mtec Geophysics	Survey defined the Steepledge Lake magnetic anomaly at high resolution
	Helicopter-borne VTEM survey	84.7 km^2, 815 line-km, 100 m spacing; 60 m mag and 33 m EM sensor heights	Geotech Limited	26 anomalies of a variety of strengths were identified for potential follow-up
	Helicopter-borne follow-up VTEM	3 km^2, 81 line-km, 25 m, 50 m, and	Geotech Limited	3 detailed drill targets defined on Bridge Zone

Year	Survey Type	Survey Details	Contractor	Comments/Results
	survey	100 m spacing; 60 m mag and 33 m EM sensor heights		
	Fixed loop TEM survey, Current Lake	14 line-km, 3 fixed loops, 27 survey lines at 50 m spacing	Crone Geophysics & Exploration Ltd.	3 areas of interest with mid- to late-time responses were delineated, 5 follow-up drill holes were recommended
	HT SQUID fixed-loop B-field TEM survey, Current, Beaver Lake, and South-east Anomaly areas	37.6 line-km, 4 large fixed loops, 18 survey lines at 200 m spacing	Crone Geophysics & Exploration Ltd.	1 moderate, multi-line anomaly and 1 possible anomaly were recommended for follow-up
	Bore hole pulse EM surveys Beaver Lake and South-east Anomaly	25 Phase 3 and 4 2008 Beaver Lake DH, 2 2008 South East Anomaly DH	Crone Geophysics & Exploration Ltd.	Surveys completed during March and April 2009; 41 conductors of various strengths and merit identified; 7 follow-up holes were recommended
	Test bore hole MMR (magnetometric resistivity) surveys	Program to test the viability of down-hole magnetometric resistivity surveys at the Project, 2 core holes used	Crone Geophysics & Exploration Ltd.	Program was part test and part research and over a 4 month period showed that DHMMR was a viable survey type to use in the TBNP environment
	Bore hole pulse EM surveys Beaver Lake area	24 Beaver Lake Phase 5, 6 and 7 drill holes surveyed during June and November 2009	Crone Geophysics & Exploration Ltd.	12 conductors of various strengths and merit were identified; many of the surveys were designed to better constrain mineralization intersected within adjacent core holes; 2 follow-up drill holes were recommended
	Geophysical data review	A review of all Magma airborne and ground geophysical surveys to October 2009; review to determine which techniques have been most effective and to propose alternate techniques to test	W. Hughes, WHEM Consulting	Review determined that previous surveys and interpretation were of good calibre; proposed that test MMR surveys be completed in order to determine whether the survey would be an effective exploration tool for disseminated mineralization at depth
2010	Bore hole pulse EM surveys	47 Beaver Lake Phase 5 through 9 holes surveyed in the Bridge Zone and Western Beaver Lake areas between February and September	Crone Geophysics & Exploration Ltd.	All of the surveys were designed to better constrain mineralization intersected within Beaver Lake infill holes; 13 follow-up drill holes were recommended, 7 were drilled
	Bore hole MMR survey	24 evenly-spaced holes throughout deposit; 1,000 m strike-length, core hole Beaver Lake Phases 2 through 9 surveyed	Crone Geophysics & Exploration Ltd.	Very large data files, modelling of MMR data is in progress with final modelling delayed until March 2011
	Moving loop/fixed loop ground EM	17 line-km, 50m line-spacing, 8	Crone Geophysics & Exploration Ltd.	Moving loop survey was switched to a fixed loop

Year	Survey Type	Survey Details	Contractor	Comments/Results
	surveys	lines, southern Current Lake, Bridge, and Western Beaver Lake zones		survey after very noisy data received; final data used to better model Bridge Zone mineralization
	Cesium vapour ground magnetic survey	A very detailed survey,16–25 m-spaced lines, continuous readings, Bridge Zone	Crone Geophysics & Exploration Ltd.	High resolution surveys used for detailed structural and geological interpretation and for localized near-surface drill hole targeting
	Bore hole physical rock properties survey	5 holes surveyed while drilling in progress on Bridge and Beaver Lake zones	DGI Geoscience Inc.	Data from surveys to be used to better constrain geophysical modelling and interpretation
	Gravity ground test survey	4 lines 5200m, detailed ground gravity surveyed over Bridge and Beaver Lake zones, 25m and 50m stations	Eastern Geophysics Ltd.	Survey showed that ground gravity was a viable technique to detect the down-plunge portions of the Current Lake Intrusive Complex
	Cesium vapour ground magnetic survey	Detailed survey, 50m-spaced lines, continuous readings, Beaver Lake and South East Anomaly areas	Crone Geophysics & Exploration Ltd.	High resolution surveys used for detailed structural and geological interpretation and for localized near-surface drill hole targeting
	Gravity ground survey	100m-spaced detailed gravity lines between eastern Beaver Lake and the eastern edges of the South East Anomaly	Eastern Geophysics Limited	Final data used to target deep ultramafic intrusive targets east of the known deposit in the South East Anomaly area
	Falcon airborne gravity gradiometer survey	1431 line-km, 75 km^2, flight-lines oriented at 040° over central Project area; 100 m sensor height	Fugro Airborne Surveys	Data used to target deep exploration hole 2.5km east of the deposit; further evaluations and modeling of the survey are in progress
	Bore hole pulse EM & 3-axis magnetic survey	Surveyed 22 recently-drilled core holes in 4 areas of the Project - South East Anomaly, Beaver Lake (Phase 10), EWC, and Lone Island Lake)	Crone Geophysics & Exploration Ltd.	All of the surveys were designed to better constrain mineralization intersected within Beaver Lake infill holes;
	Surface MMR test survey	Surveyed 1600m segment of Section 357950E over known moderate to high-grade mineralization	Crone Geophysics & Exploration Ltd.	Survey completed, data processing is complex and is in progress
	Surface UTEM ISR (inductive source resistivity) test survey	Surveyed 1,600 m of Section 357950E over known moderate to high-grade mineralization	Lamontagne Geophysics	The ISR test determined that this type of survey may be useful in detecting disseminated mineralization at depth,
	Borehole Pulse EM Survey	Surveyed 3 recently drilled core	Crone Geophysics & Exploration Ltd.	Data from surveys is has been processed but is

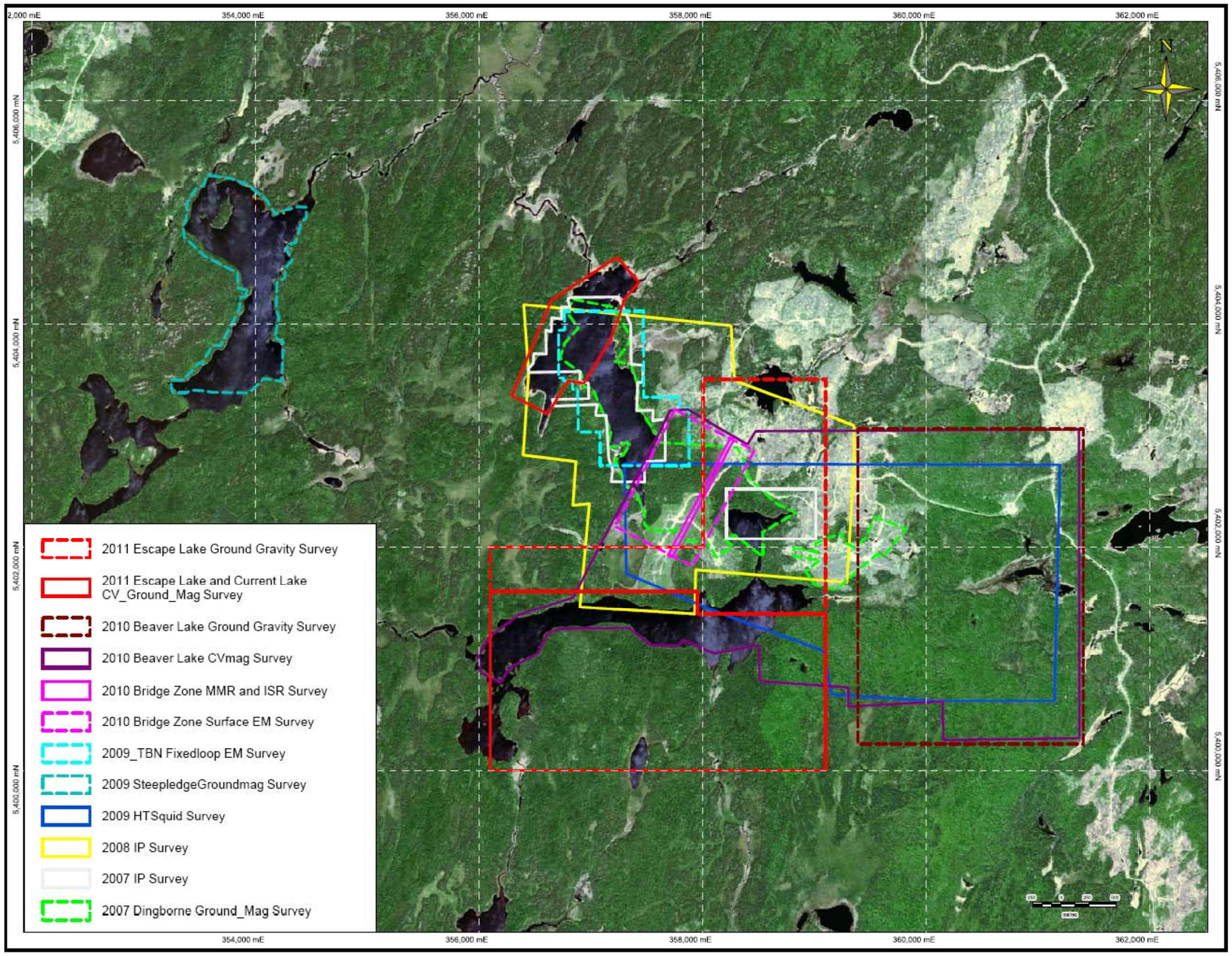
Year	Survey Type	Survey Details	Contractor	Comments/Results
		holes in the SEA, and Beaver Lake, areas of the Project; all holes were tested using both normal coupled (In-loop) and reversely coupled (out-of-loop) surveys		still being modeled
	Airborne magnetic and radiometric surveys	Surveyed 2061 line-km comprising 3 previously unsurveyed blocks within the Project	Aeroquest Limited	Surveys are complete and the data is being processed
2011	Borehole pulse EM surveys	Surveyed 5 recently drilled core holes in the SEA, and Beaver Lake, areas; all holes were tested using both normal coupled (In-loop) and reversely coupled (out-of-loop) surveys	Crone Geophysics & Exploration Ltd.	Data from surveys is still being processed and modeled
	Borehole pulse EM surveys	Active core drill rig-based surveys using both normal coupled (In-loop) and reversely coupled (out-of-loop) surveys; surveys are ongoing	Crone Geophysics & Exploration Ltd.	Surveys ongoing
	Cesium vapour ground magnetic surveys	50m-spaced, 96 line-km, high-resolution magnetic survey, over Escape Lake area; 25m-spaced, 30 line-km, high-resolution survey over NW portion of Current Lake	Crone Geophysics & Exploration Ltd.	High resolution surveys used for detailed structural and geological interpretation and for localized near-surface drill hole targeting both surveys in processing stage as of this report's effective date
	Gravity ground survey	100m-spaced detailed gravity lines over the Beaver Lake body and the Escape Lake area; 82 line-km	Eastern Geophysics Limited	Data processing ongoing; survey will be used to target shallow to moderate depth ultramafic intrusive bodies

Figure 10-1: Index Location Plan, Airborne Geophysical Surveys



Note: Geophysical surveys superimposed on a total magnetic intensity image backdrop. The 2008 UTS survey outline corresponds to that of the Project outline. Figure courtesy Magma Metals

Figure 10-2: Index Location Plan, Ground Geophysical Surveys



Note: Figure courtesy Magma Metals

10.7 Petrology, Mineralogy and Other Research Studies

A series of limited, purely descriptive petrographic studies (thin and polished thin sections) were completed between March and December of 2008 by Dr. Graham Wilson of Turnstone Geological Services Ltd. No conclusions were reported from his observations. A catalogue of rock types associated with the Current Lake Intrusive Complex was prepared using the work as a guide.

Dr. Rebecca Sproule of the Geodiscovery Group completed a preliminary analysis of the existing assay and lithogeochemical database in September and October 2008. Key items noted were that the intrusions identified were derived from a tholeiitic magma which had a degree of crustal contamination, the PGE and chalcophile element geochemistry was homogeneous, and that potential existed to the southeast for massive Ni–Cu–PGE mineralization.

In late 2009, Magma Metals contracted Dr. V. Roland Goodgame of Taloumba Inc. to complete a pilot lithogeochemical and petrographic study on the Current Lake Intrusive Complex. The main conclusions of the study were that the magmas were formed from a crustal plume, wall rock contamination had occurred, and that variations in Cu grade and (Cu/Pd)*10,000 showed potential as vectors to mineralization.

A detailed sulphide fractionation study using the existing assay database was initiated in October 2010 by Dr. Anthony E. Beswick. The project was divided into three stages that examined:

- Compositional variations and lithological relationships between S, Ni, Cu and Co/S within the four zones of the Thunder Bay North deposit;
- Compositional variations of Ag, Au, Pt, and Pd within the four zones of the Thunder Bay North Deposit; and
- Spatial aspects of the compositional variations in the Current Lake, Bridge, and Beaver Lake zones of the Thunder Bay North Deposit.

Dr. Beswick concluded that

- The semi-massive sulphide samples, as measured by high (Ni+Cu+S) values, in each of the three zones appear to indicate some spatial control on their distributions: in the Current Lake Zone there is a tendency for high-grade sulphides to be located at points where the strike of the conduit abruptly changes strike direction; in the Bridge Zone semi-massive and massive sulphides concentrate along the northeastern margin of the zone particularly near the eastern end where it joins with the Beaver Lake Zone; and in the Beaver Lake Zone semi-massive sulphides are preferentially distributed along the northern and western margins of the zone. These spatial variations suggest that transport of entrained sulphides in a northwesterly direction into the bottleneck present at the entrance to the Bridge Zone.

- Examination of the variations in (Ni+Cu)/S values of the semi-massive and massive sulphides within each of the three zones suggest that these sulphides represent partially crystallized sulphide melts that were fractionated, prior to their 'fragmentation' into disconnected blobs. The resulting blobs/fragments were then entrained within the melt and transported into the conduit system.
- Variations in Pt/S values show no obvious spatial controls with high and low values spread throughout without regard for depth, location along the conduit, or changes in its strike.
- The data strongly suggest that deposit(s) of Ni-rich massive sulphides may exist magmatically upstream of the presently defined, primarily disseminated Cu-PGE deposit. Magmatic upstream is interpreted to be to the southeast of the deposit in the direction of the Southeast Anomaly.

A Master of Science thesis study of the Current Lake Intrusive Complex hybrid rocks is underway, by M. Chaffee, from the University of Minnesota Duluth and Lakehead University.

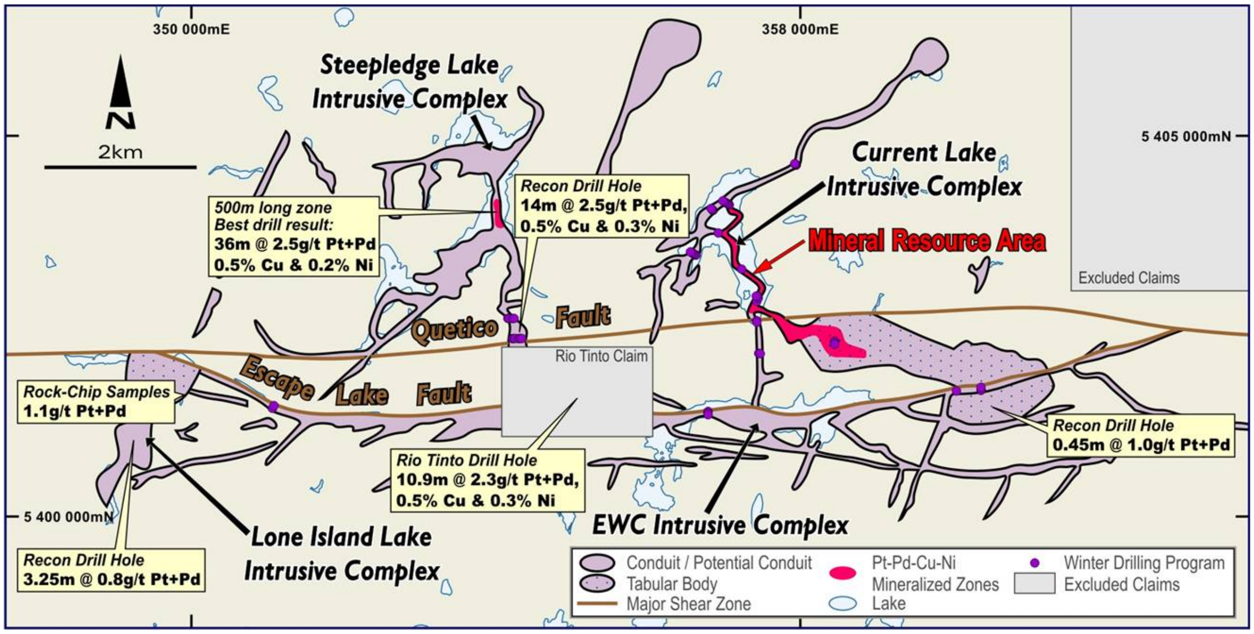
10.8 Exploration Potential

The known deposits associated with the Current Lake Intrusive Complex are open along strike to the north of the Current Lake Zone and along-strike to the east-southeast of the “Spine” area of the Beaver Lake Zone. In addition, geophysical and drill anomalies remain to be tested outside the area of the known mineralization.

Figure 10-3 presents the locations of the major target areas within the Project.

Within the area of the mineral resource estimate, key targets include testing for the presence of heavily disseminated, semi-massive or massive sulphides (refer to Section 10.8.1) and follow-up of bore hole EM anomalies.

Figure 10-3: Location Plan, Key Exploration Targets



Mid-2010 drilling on the South East Anomaly (refer to Section 10.9.2) has shown that mineralized peridotite similar to that observed within the defined deposit is present 2 km southeast of the Beaver Lake Zone. These drill intercepts occur along the margins of the recently-defined gravity anomaly that is continuous with the portion of the Current Lake Intrusive Complex hosting the Beaver Lake mineralization. This result strongly suggests that the gravity anomaly represents a continuation/extension of the Current Lake Intrusive Complex and has excellent potential to host disseminated and massive sulphide mineralization. This interpretation is reinforced by the work of Dr. A.E. Beswick (refer to Section 10.7), which suggested that the Ni-rich massive sulphide portion of the system is missing and that the existing deposit consists of fractionated sulphides physically removed from an existing massive Ni-rich sulphide body located magmatically upstream.

The Steepledge Lake Intrusive Complex (refer to Section 10.8.3) is a mirror image of the Current Lake Intrusive Complex and is located 3.5 km to the west–northwest. It hosts rock-types and low- to moderate-grade mineralization that are very similar to those within the Current Lake Complex and has the potential to host disseminated and massive sulphide mineralization. At present no deposits are defined within the Steepledge Complex and more drilling needs to be done to follow-up the known mineralized intercepts.

The Lone Island Lake Intrusive Complex is somewhat different in form and has not been evaluated in any detail. Low-grade PGE–Cu–Ni sulphide mineralization is present within the system and the potential exists to find additional mineralization.

Mineralized mafic–ultramafic conduit systems such as those discovered in the Project area can occur as three-dimensional stacked clusters; the Noril'sk–Talnakh system is a good example of such a stacked system. Therefore, there is reasonable potential for other mineralized conduits to be present at depth below the two presently-defined conduits as well as near-surface elsewhere within the confines of the Project tenure.

10.8.1 High Sulphide Target

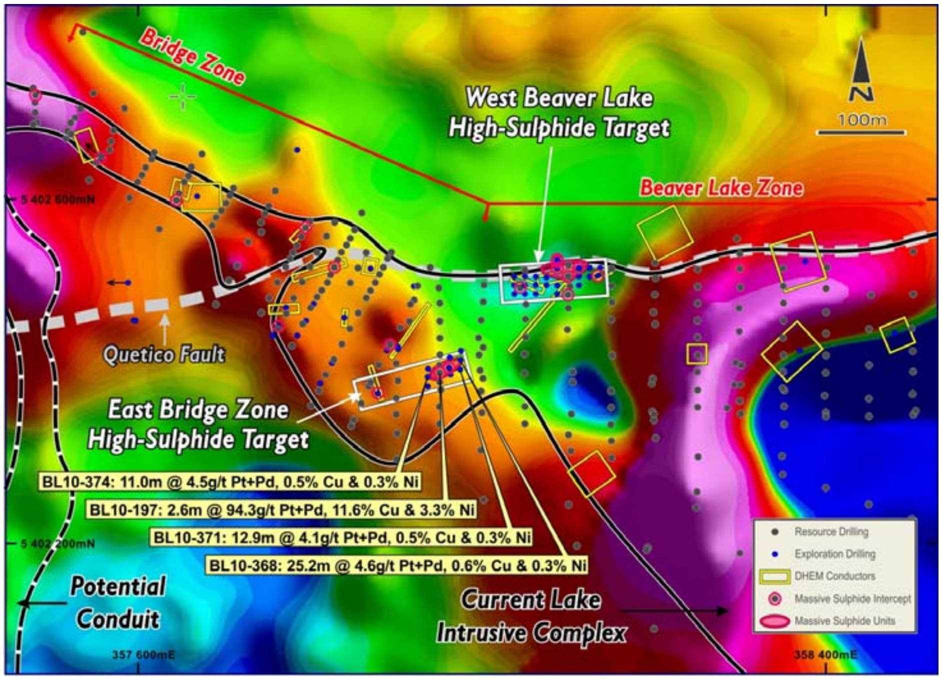
Magma Metals completed a program of drilling in the Bridge and Beaver Lake Zones in the Current Lake Intrusive Complex, which tested 13 down-hole electro-magnetic (DHEM) targets with a single hole into each. The bore hole EM anomalies were interpreted to reflect potential high-sulphide zones containing heavily disseminated, semi-massive or massive sulphides. Seven intersections of high-sulphide zones were recorded in this program. In all, 14 intersections of massive sulphides have been made within a 700 m strike length of the Bridge and western Beaver Lake Zones in the resource drilling and the more recent drilling targeting the bore hole EM anomalies.

High-sulphide zones have the potential to form high-value domains within the resource. Areas, indicated in Figure 10-4 as a white rectangle, were been selected for detailed follow-up drilling. A drill program totalling 37 holes (8853 m), and planned as a follow-up program to test massive sulphide intercepts and bore hole EM anomalies in the Western Beaver Lake area was completed in mid-December 2010. The program was designed to better define two known massive and net-textured sulphides zones such that their connectivity could be established and their potential better evaluated. This drilling defined two massive to net-textured zones; approximately 40 m in length, 10–20 m in width, and up to 2.6 m in thickness.

10.8.2 South East Anomaly (Gravity Anomaly)

A magnetic anomaly, termed the South East Anomaly was subject to a ground gravity survey during 2010 that indicated the centres of the two geophysical anomalies were off-set. Modelling of the gravity anomaly indicated the likely presence of a 2.2 km long, 500 m wide, 200 m thick peridotite body.

Figure 10-4: High-Sulphide Targets



Note: Figure courtesy Magma Metals

A single (1,965 m) core hole was drilled into the eastern portion of the anomaly to determine whether the gravity anomaly was host to ultramafic rock. This drill hole (SEA10-06) was completed in October 2010 and no ultramafic body of any size was intersected; however, numerous mafic and ultramafic dykes and sills of a variety of thicknesses were intersected between 1,000 m and 1,600 m depth. A second planned hole was partially drilled to a depth of 262m to serve as a shakedown of a new deep drill. This hole has not yet been extended to its target depth.

A reinterpretation of the magnetic anomaly by Magma Metals staff suggests that it is due to a thick magnetite-rich gabbro and gabbro-hybrid body overlying a less magnetic peridotite body, which could be the source of the gravity anomaly. This is supported by exploration drilling on the southern edge of the gravity anomaly, which intercepted peridotite beneath a thick gabbro and gabbro-hybrid body, and encountered PGE mineralization.

Regional Exploration

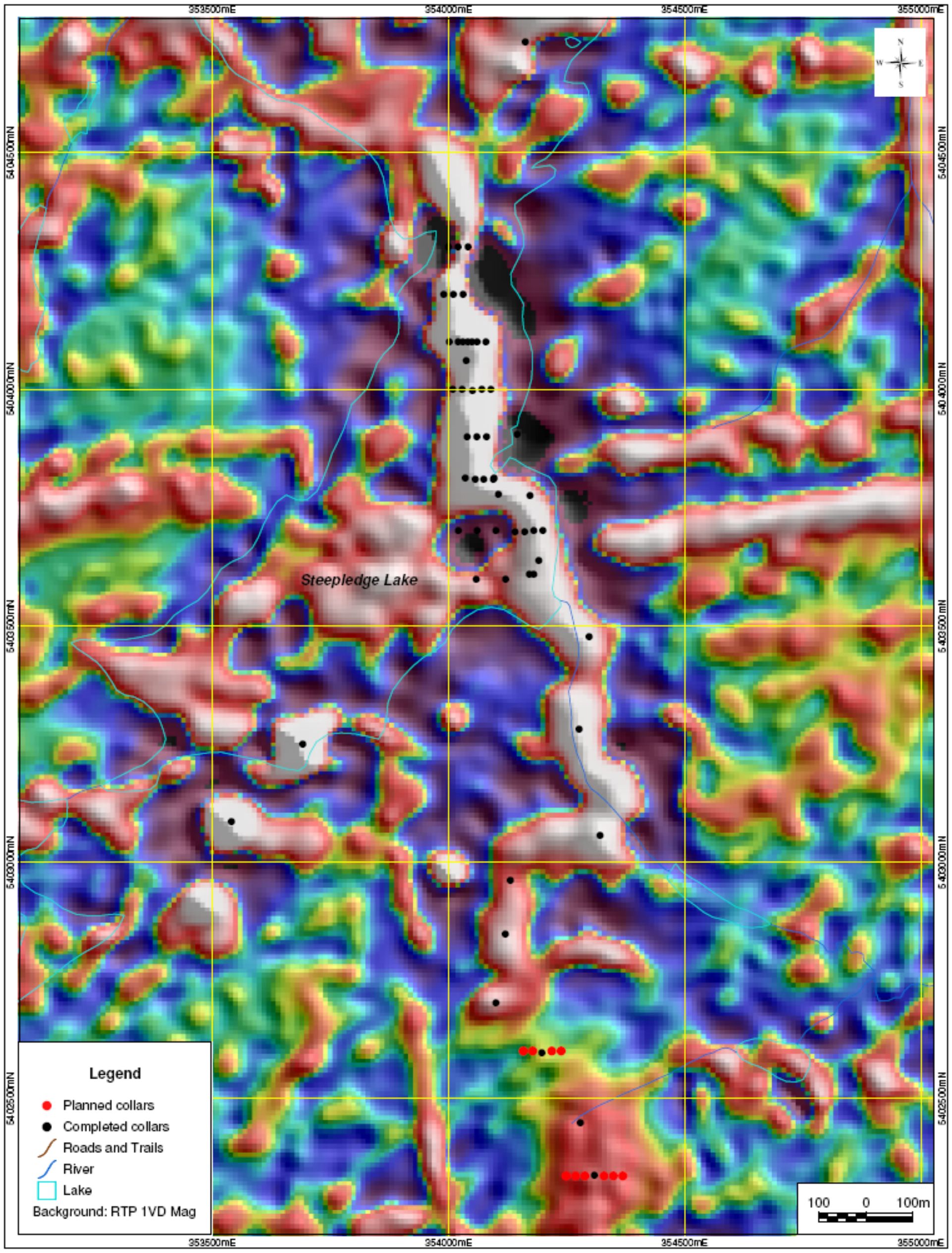
The Steepledge Lake intrusive complex, a magma conduit that is at least 6 km long, 4 km of which is held by Magma Metals, was drill tested in 2009 and early 2010. Drill results indicated a wider and thicker body of peridotite compared to that encountered at Current Lake (Figure 10-5). Magma Metals noted to AMEC that the average Pt:Pd ratio appears to be slightly lower at Steepledge Lake, and the combined Cu and Ni values significantly higher than in the Current Lake Complex, which to Magma Metals staff indicated a probable different source magma.

Mineralization that grades >1 g/t combined Pt and Pd has been defined to date over about 500 m of strike. Additional drilling (10 holes, 3,990 m) is planned to further test the southern portion of the system during late February 2011. The Lone Island Lake intrusive complex is also planned to be drill tested in mid-2011.

10.9 Comment on Section 10

In the opinion of the QPs, the exploration programs completed to date are appropriate to the style of the deposits and prospects within the Project. The structural, age dating, and petrographic research work supports the genetic and affinity interpretations. The Project remains prospective for additional magmatic sulphide type mineralization.

Figure 10-5: Steepledge Lake Magnetics Plan



Note: Figure courtesy Magma Metals.

11.0 DRILLING

Drilling commenced late in 2006, and has continued to the present. All drilling has been completed using core methods, and, as at 17 March 2011, totalled 712 core holes (141,231.5 m). This drill total includes all reconnaissance, delineation, and infill drilling completed on the Project to 17 March, 2011. Of this total, 528 core holes (97,676 m) support the September 2010 mineral resource estimation. A further 115 drill holes (26,486.8 m) were drilled and three were extended (890 m) within the Project boundaries after the resource estimate database close-out date of 31 May 2010.

A drilling summary is provided in Table 11-1. Drill hole location plans are provided by area, and include Figure 11-1 (Current Lake), Figure 11-2 (Beaver Lake and Bridge Zone), Figure 3 (South East Anomaly), Figure 4 (Steepledge Lake), and Figure 11-5 (Lone Island Lake).

11.1 Drilling Methods and Equipment

Four drill contractors have been used in the period 2006–2011:

- Dominion Drilling of Pleasantdale, Saskatchewan (Current Lake Phases 1 and 2, Beaver Lake Phase 1). Drilling was land-based, and helicopter-supported.
- Boart Longyear Inc. of North Bay, Ontario (Beaver Lake Phase 2). Drilling was land-based.
- George Downing Estate Drilling Limited of Grenville-sur-la-Rouge, Quebec (all other drilling). Drilling included two ice-based programs, two barge-based programs, several land-based drill programs, and one helicopter-supported program.
- Chibougamau Diamond Drilling of Chibougamau, Quebec. Drilling consisted of the deep extension of two existing drill holes and the drilling of one short drill hole at the South East Anomaly.

Rigs employed during the programs include a helicopter-portable Boyles 37, a skid mounted LM-55, a DuraLite 5000, several Longyear LF-70s, and a Longyear HC-150. The Magma Metals geologists have observed that deeper drill targets in the Beaver Lake Zone and the South East Anomaly target area are at the limits of the capabilities of the drill rigs currently being utilized and are likely to require larger drills for evaluation purposes.

All core was drilled at NQ size (47.6 mm diameter).

Table 11-1: Drill Summary Table

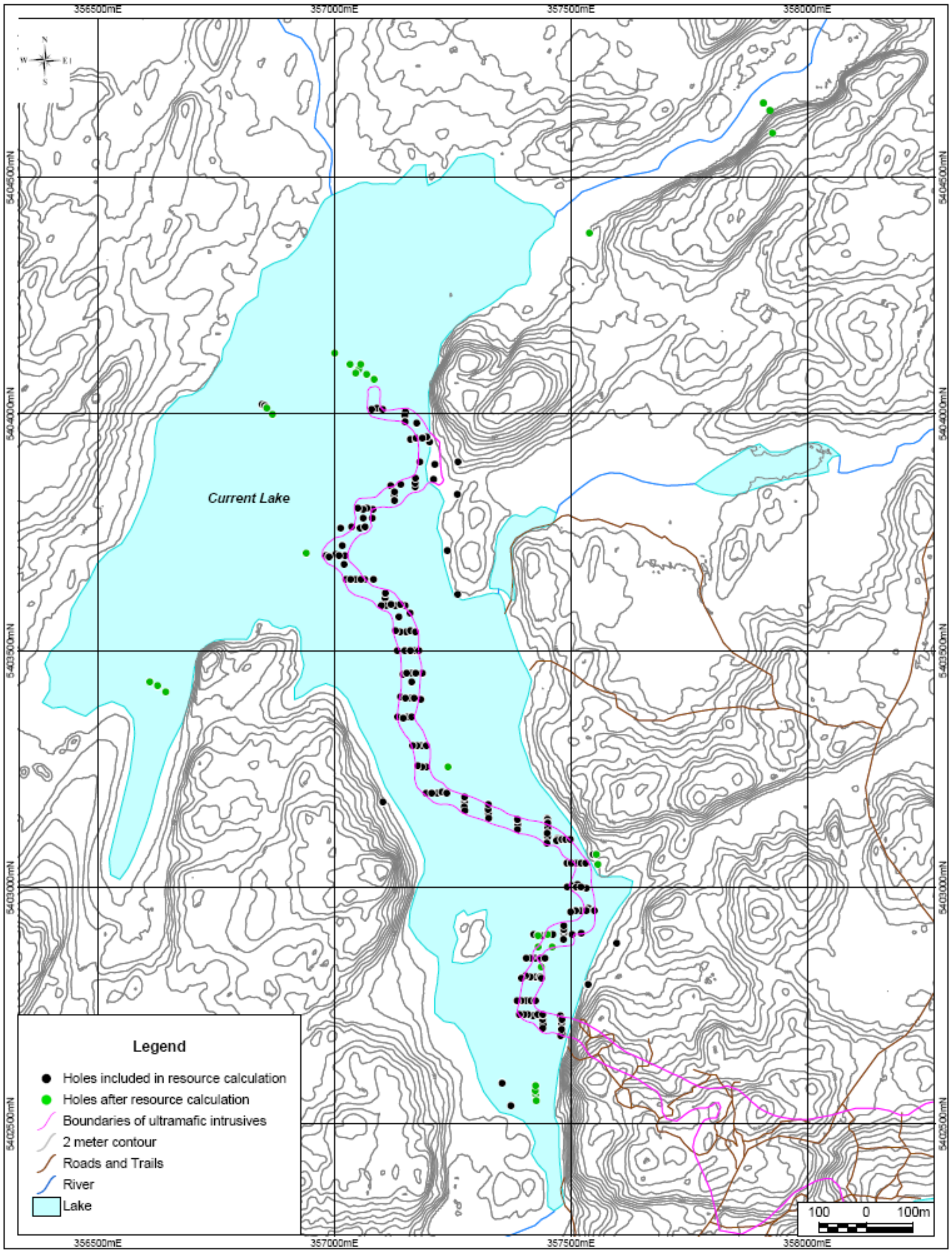
Year	Area	Drill Phase	Drill Hole Series ID	Number of Drill Holes	Number of Metres	Comment
2006	Current Lake	Phase 1 Drilling	TBND001 to TBND006	6	1590.5	Tested the area of the East Shore boulder cluster, and intersected mineralized peridotite
2007	Current Lake	Phase 2 Drilling	TBND007 to TBND 034	28	3,078.3	Determined tube-like magmatic conduit morphology of Current Lake peridotite; holes TBND027 through TBND032 intersected moderate to good grade mineralization
	Beaver Lake	Phase 1 Drilling	BL07-01	1	500	Showed that peridotite existed in the Beaver Lake area
	Beaver Lake	Phase 2 Drilling	BL07-02 to BL07-07	6	2,014.5	Proved that the Beaver Lake peridotite hosted magmatic conduit-style Pt–Pd–Cu–Ni mineralization similar to that encountered at Current Lake
	Lone Island Lake	Reconnaissance Drilling	LIL07-01	1	387	No intrusive rocks intersected
2008	Current Lake	Phase 3 Drilling	TBND035 to TBND057	23	1,834	Demonstrated continuity of mineralization within the northern portion of Current Lake Zone
	Beaver Lake	Phase 3 Drilling	BL08-08 to BL08-43	26	8,008.5	Further outlined the basal sulphide mineralization present within the Beaver Lake Pt–Pd–Cu–Ni Zone and discovered the diffuse Cloud Pt–Pd–Cu–Ni Zone mineralization present within the upper portions of the northern half of the Beaver Lake body
	Current Lake	Phase 4 Barge Drilling	TBND058 to TBND123	67	5,571.5	Demonstrated that consistent, continuous good-grade Pt-Pd–Cu–Ni mineralization was present beneath the southern one-third of Current Lake
	Beaver Lake	Phase 4 Drilling	BL08-44 to BL08-83	40	13,089.7	Discovered the basal sulphide mineralization associated with the ‘Spine’ Zone located within the core of the Beaver body; the Spine Zone is now considered a sub-zone of the Beaver Lake Zone and does not form a separate and distinct zone
	Reconnaissance	Reconnaissance Drilling	South East Anomaly (SEA08-01 and SEA08-02), CasRon (CR08-01),	7	2,765	Tested several outlying targets located within the Project claims that had not yet been evaluated and included the South East Anomaly, CasRon, Steepledge Lake, and Lone Island Lake areas. Low-grade PGE–Cu–Ni mineralization was intersected within the four Steepledge Lake and Lone Island

Year	Area	Drill Phase	Drill Hole Series ID	Number of Drill Holes	Number of Metres	Comment
			Steepledge Lake (SL08-01 and SL08-02), Lone Island Lake areas (LIL08-01 and LIL08-02)			Lake holes. A mineralized peridotite body similar to that hosting the Current and Bridge Zone mineralization was intersected by both Steepledge Lake holes. The weakly mineralized ultramafic intrusive rocks intersected in the Lone Island Lake area were different in appearance to the Current Lake and Steepledge Lake intrusions, but are thought be of similar age and to comprise another portion of the same magmatic conduit system
2009	Current Lake	Phase 5 Ice Drilling	TBND124 to TBND209	86	6,726	Demonstrated continuity of mineralization for most of the length of the Current Lake Zone. Infilled existing gaps in the Current Lake drilling, and provided an acceptable drill density to support a first-time mineral resource estimate
	Beaver Lake	Phase 5 Drilling	BL09-84 to BL09-121	38	7,989.5	Successful in joining the Current Lake and Beaver Lake mineralized systems into a single, almost continuously mineralized system by defining the interconnecting Bridge Zone. Drill spacing sufficient to support mineral resource estimation.
	Beaver Lake	Phase 6 Drilling	BL09-122 to BL09-166	45	12,460.8	Infill program designed to increase drill density sufficiently to support classification of potential indicated mineral resources
	Steepledge Lake	Phase 1 Barge Drilling	SL09-03 to SL09-34	32	6,212	Tested a magnetic anomaly very similar in character to the Current Lake magnetic anomaly that is coincident with the Current Lake mineralized zone. This drill program intersected low- to moderate-grade mineralization similar to that present within the Current Lake Zone
	Steepledge Lake	Phase 2 Helicopter Drilling	SL09-35 to SL09-41	7	2,217	Significant mineralization was only present within SL09-41, the southernmost hole of the program
	Beaver Lake	Phase 7	BL09-167 to BL09-188	22	4,195.5	Bridge Zone portion of Beaver Lake infill drilling program designed to increase drill density sufficiently to support potential classification of Indicated mineral resources
2010	Greenwich Lake	Phase 1 Reconnaissance	SEA08-01 and	5	1,429	The targeted peridotite was intersected within both

Year	Area	Drill Phase	Drill Hole Series ID	Number of Drill Holes	Number of Metres	Comment
	(South East Anomaly)		SEA08-02 deepened; SEA01-03 to SEA08-05			extended holes. The three remaining drill holes tested a shallow, linear magnetic anomaly.
	Lone Island Lake	Reconnaissance	EWC10-01 to EWC10-06; LIL10-03 to LIL10-08	12	4,249.5	Six reconnaissance holes (EWC10-01 to -06) targeted a variety of airborne magnetic targets west of Lone Island Lake and a further 6 holes (LIL10-03 to -08) were drilled on the previously tested Lone Island Lake magnetic anomaly.
	Current Lake	Follow-up Drilling	TBND210 to TBND213	4	661	2 holes (TBND210 and 211) were drilled to intersect the southern portion of the Current Lake Zone with 1 intersecting good grade mineralization; the 2 remaining holes tested a linear magnetic anomaly to the NE of Current Lake but did not intersect anything significant.
	Steepledge Lake	Phase 3 Drilling	SL10-42 to -54, including -42B	14	2,242	These holes were planned to test the southern extension of the Steepledge Lake Intrusive Complex and all intersected peridotite or olivine melagabbro; several intervals of low-grade PGEs were intersected, but have not undergone follow-up.
	Beaver Lake	Phase 8	BL10-189 to BL10-307, BL10-310 to BL10-316, and BL10-320 to BL10-321	128	30,519.5	Beaver Lake and Bridge Zone infill drilling program designed to increase the drill density to the point where indicated status could be calculated. Refined the limits of the mineralization and intersected several narrow massive sulphide intervals (up to 2.6m thick), mainly within the western Beaver Lake Zone.
	Beaver Lake	Phase 9	BL10-308 and BL10-309, BL10-317 to BL10-319, BL10-322 to BL10-341	28	5,843.9	Intersected high-grade mineralization, including several narrow massive sulphide intercepts. Included within the program was the extension of BL09-161. Three drill holes of the program were abandoned at shallow depths (BL10-331A, BL10-322, BL10-336A); these holes were re-collared and subsequently drilled to target depths.
	Greenwich Lake	Gravity Follow-up	SEA10-06 and	2	2229.0	Two of a planned 10 holes were completed; no large

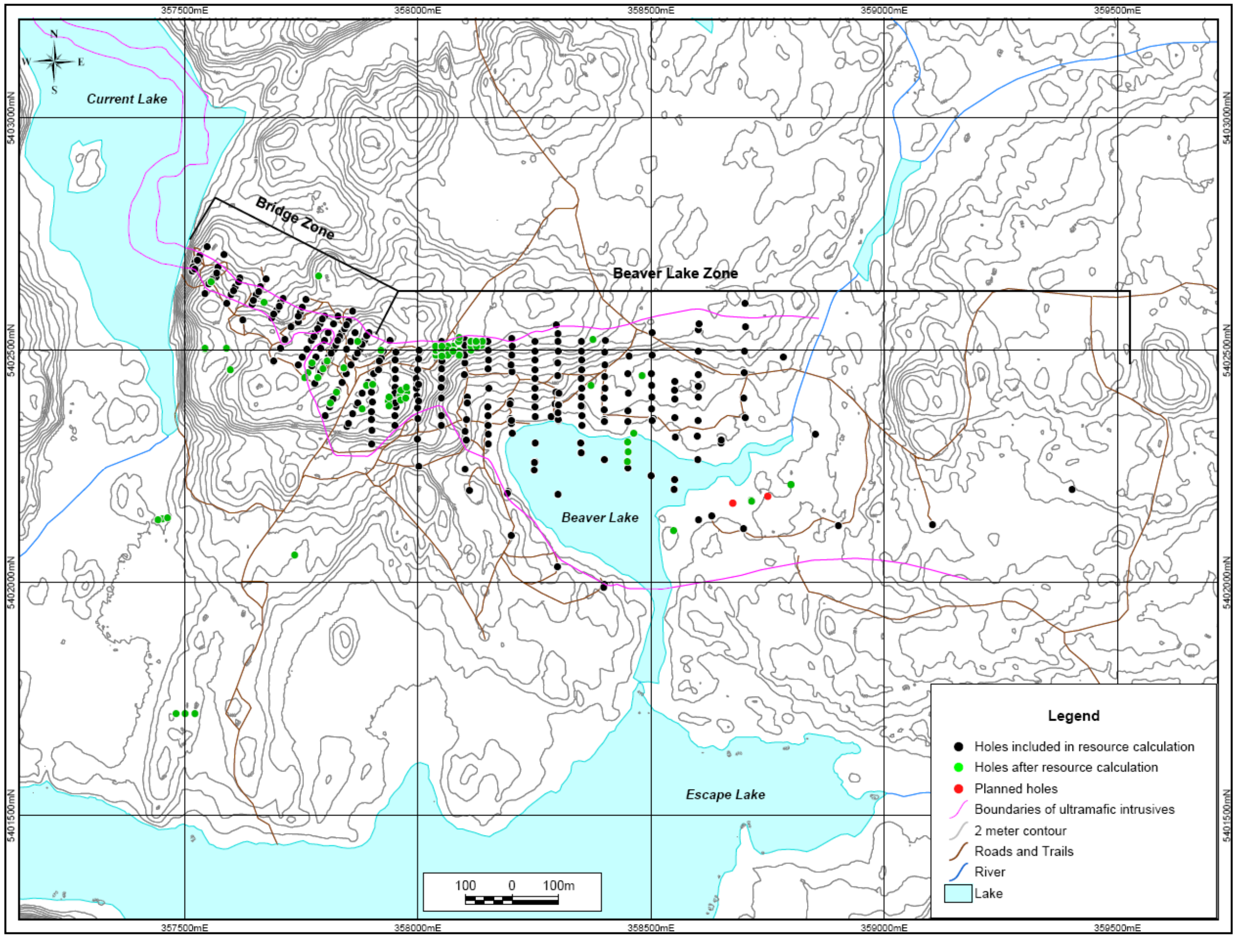
Year	Area	Drill Phase	Drill Hole Series ID	Number of Drill Holes	Number of Metres	Comment
	(South East Anomaly		SEA10-07			ultramafic body was intersected; however, numerous mafic to locally ultramafic sills were intersected between 1,000 m and 1,600 m depth in SEA10-06.
	Beaver Lake	Phase 10	BL10-342 to BL10-377	37	8853.0	Detailed infill holes designed to define the limits of known massive to net-textured sulphide zones; program defined two 40 m-long, 10–20 m wide, up to 2.6 m-thick zones
2011	Greenwich Lake (South East Anomaly	Reconnaissance	SEA11-08 to SEA11-12	5	555.0	All holes intersected metasedimentary rocks with varying amounts of deformed granitoid dykes and several late mafic intrusive (hybrid) sills
	Lone Island Lake-East-West Connector	Reconnaissance	EWC11-07 to EWC11-08	2	333.0	Both holes intersected metasedimentary rocks, but no mafic or ultramafic intrusive rocks were intersected.
	Escape Lake	Reconnaissance	EL11-01-EL11-03	3	601.3	All three holes intersected metasedimentary rocks and several magnetic mafic intrusive sills.
	Steepledge Lake South	Phase 4 Follow-up	SL11-55 to SL11-58	4	595.5	This program is follow up mineralization intersected within two previously completed drill holes and was in progress as of this report's effective date; mineralization is present within several of the holes.
	Beaver Lake/Current Lake South	Reconnaissance	BL11-378 to BL11-385	8	2100.0	This program tested several targets in the Beaver Lake/Current Lake South area. Four were completed to test a target within a previously barren portion the resource area with one hole intersecting good mineralization. Drilling in progress as of this report's effective date.
	Current Lake	Phase 7 Reconnaissance	TBND214 and TBND238	25	2380.0	Most holes drilled were reconnaissance in nature; however, 14 holes were drilled within or marginal to the mineral resource area, with most holes intersecting the targeted peridotite; several of these holes intersected moderate to high grade mineralization.
Totals				***712***	***141,231.5***	

Figure 11-1: Drill Hole Location Plan, Current Lake Zone



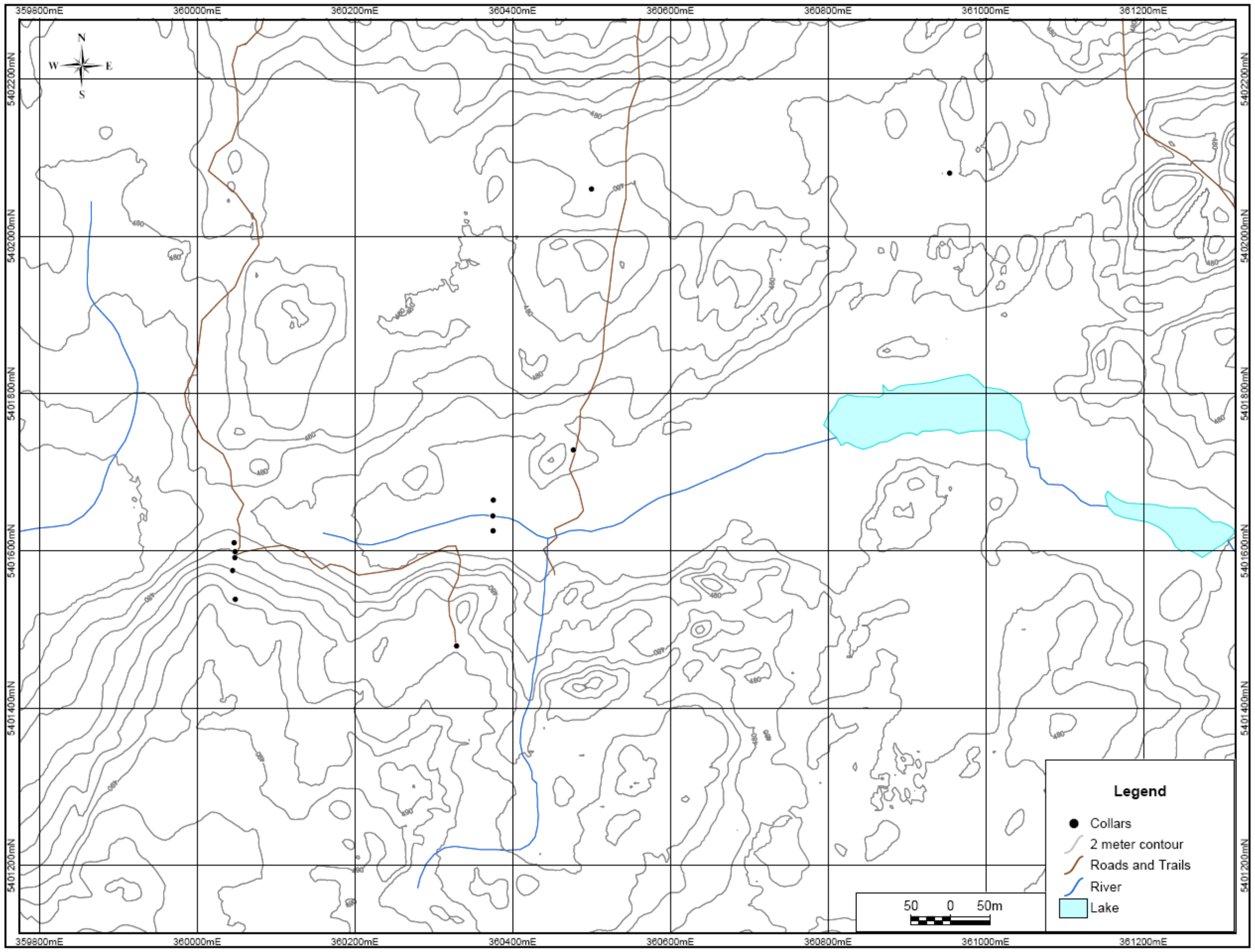
Note: Figure courtesy Magma Metals. Drill holes noted as not included in resource estimation are drill holes that were completed after the database close-off date at 31 May 2010

Figure 11-2: Drill Hole Location Plan, Beaver Lake Zone and Bridge Zone



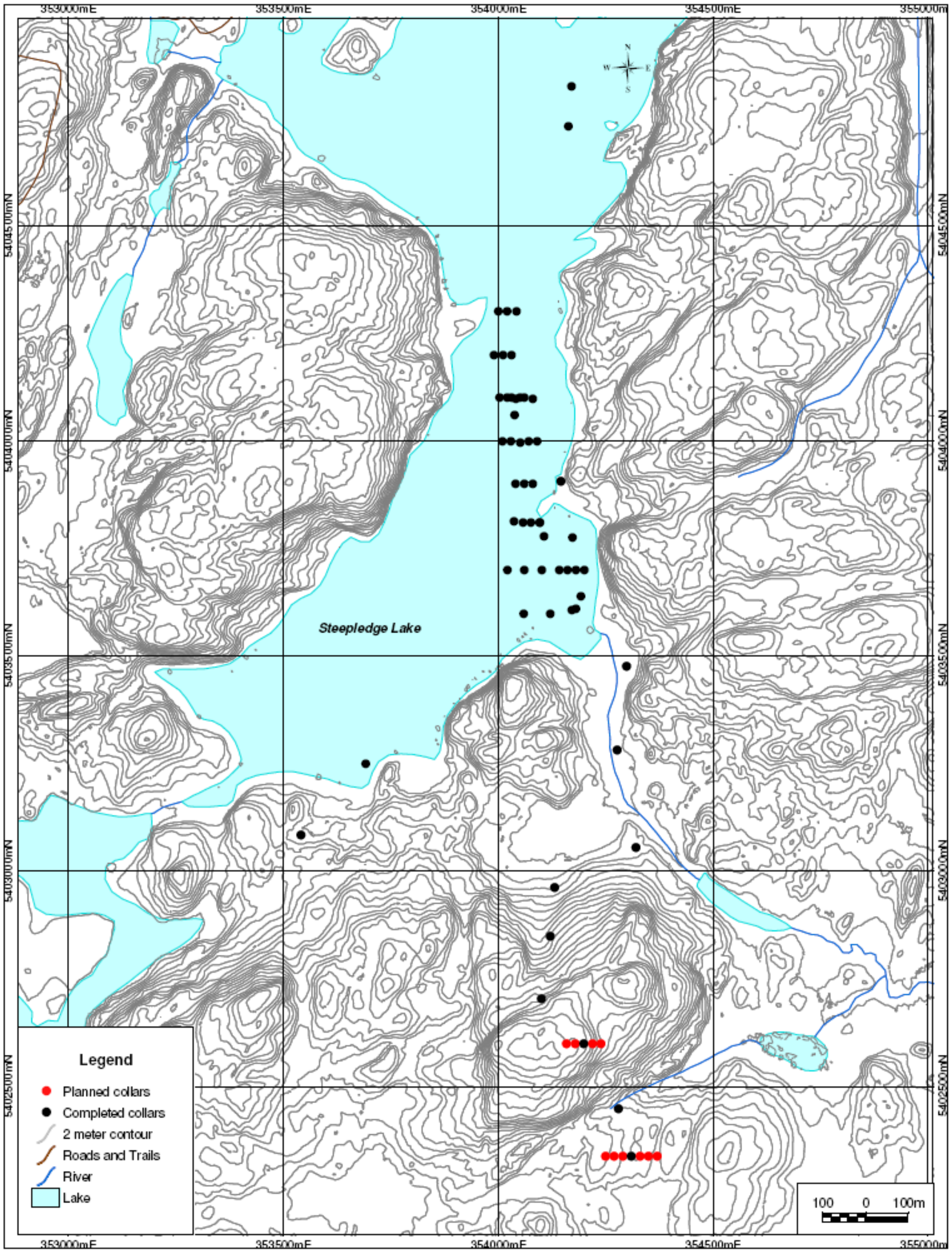
Note: Figure courtesy Magma Metals. Drill holes noted as not included in resource estimation are drill holes that were completed after the database close-off date at 31 May 2010.

Figure 11-3: Drill Hole Location Plan, South East Anomaly



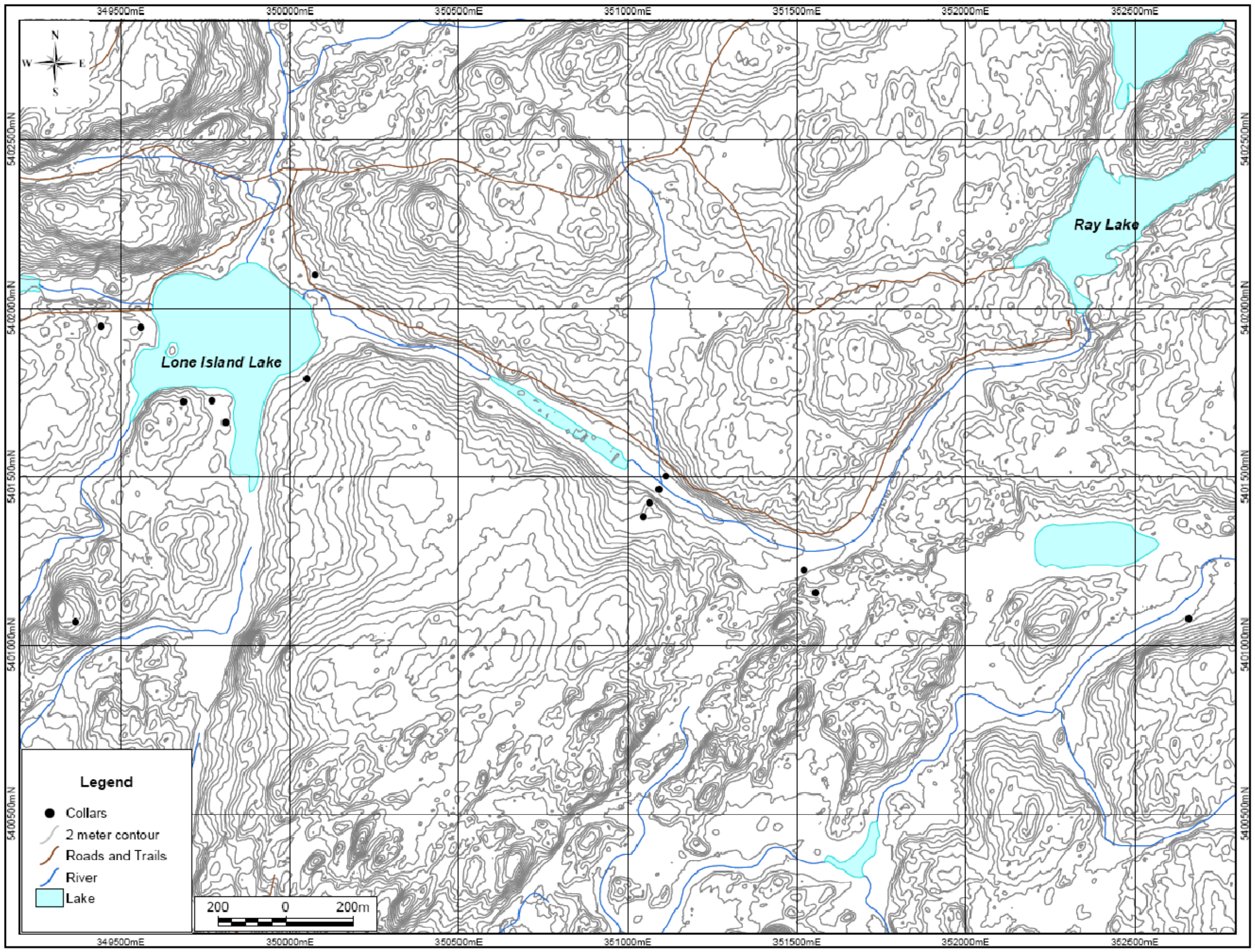
Note: Figure courtesy Magma Metals.

Figure 11-4: Drill Location Plan, Steepledge Lake



Note: Figure courtesy Magma Metals.

Figure 11-5: Drill Hole Location Plan, Lone Island Lake



Note: Figure courtesy Magma Metals.

Core is securely wrapped and stored on site at the drill rig. If the drill rig is not road-accessible, core is transported to the nearest road by the drilling contractor via heavy equipment for land-based drill rigs, by helicopter for helicopter-supported programs, or by pontoon boat for barge drill programs. Magma Metals personnel pick up the drill core and transport it to the logging facility by truck. At the logging facility the core is unwrapped by Magma Metals personnel and processed.

11.2 Geological Logging

Drill core is either logged in the field at Magma Metals' drill camp or at Magma Metals' secure core logging and sampling facility in Thunder Bay by qualified Magma Metals geologists. Previous to October 2009 drill core from the Project was transported to the Thunder Bay facility by Magma Metals personnel within a company vehicle for sampling. After October 2009 all Project-related core was sampled on-site at the onsite drill camp.

From December 2006 to July 2008, geological logging was performed using laptop computers and a standardized Microsoft Excel® logging template. As the drill programs advanced Project knowledge, the template was modified to collect quantitative data.

During August 2008, logging was switched to OCRIS™, a SQL-based, quantitative core logging software program, designed by St. Arnaud Data Management Pty Ltd of Perth, Western Australia, for all core logging.

The geologists log core directly into laptop computers. This ensures the geologists conform to a standardized core logging format and nomenclature. Logging of lithology, alteration, veining, structure, mineralization, and sampling have been categorized through use of drop-down legends that require the logging geologist to select from pre-set codes. Features are recorded separately for each category. Any unique feature not accounted for in the pre-set legends is noted in a comments field. Intervals of core that are not sampled are noted with the interval and the reason for the core not being sampled; non-sampling can be as a consequence, for example, of voids, or overburden.

The logging system also provides data entry error traps to ensure data integrity. Quick logs are sent to the Thunder Bay office on a daily basis. Complete log transfers are done upon the completion of the drill hole logging.

Excel spreadsheets are currently still employed for reconnaissance drill logging, where the drilling is not associated with the known mineralized zones.

Since September, 2008, core has been routinely wet-photographed using a digital camera.

Magnetic susceptibility measurements are taken on the drill core with a hand-held meter approximately every 1.5 m along the entire length of the core interval in peridotite. For areas of sediment or granite, the approximate measurement interval may be as much as 3 m. The measurements are manually keyed into a spreadsheet then imported into the Project database.

11.3 Geotechnical Logging

Geologists measure the core to determine recoveries and count natural core breaks to calculate rock quality designations for selected intervals of selected core holes.

Structural and geotechnical logging is currently not based on oriented core because there is no available system that can orient core from vertically-drilled holes.

No other geotechnical core logging is currently being undertaken at the Project although the existence of significant fracture zones and broken and blocky ground is reasonably well documented (refer to Section 11.4).

11.4 Core Recovery

Core recoveries were not generally recorded. Where data are available, measurements indicate that core recoveries are generally high within the drilled units.

Average core recoveries by lithology comprise:

- Ultramafic intrusions >95%
- Hybrid intrusive 60–95%, average 90%
- Granitic bodies >95%
- Meta-sediments >95% (exceptions listed below)
- Fault zones within meta-sediments 20–90%, highly variable
- Intrusive breccias 0–90%, highly variable.

There is a drill-defined area of poor ground conditions that exists above the ultramafic intrusive, located to the west side of Beaver Lake and which extends underneath the northern portion of Beaver Lake itself. Within this zone of poor ground conditions the core recoveries were commonly 0% due to a tri-cone drill bit being used to penetrate the zone of poor ground. From the recovered fragments of core it has been determined that this area consists of several intersecting structures and the rock type itself is an unmineralized intrusive breccia.

11.5 Collar Surveys

Drill sites prior to February 2008 were located in the field using a wide area augmentation system (WAAS) enabled, hand-held global positioning system (GPS) instrument. From mid-February 2008 all drill holes have been sited using a differential GPS (DGPS).

On completion of drilling, all collar locations were resurveyed with the DGPS.

The UTM location (NAD83 datum, Zone 16), elevation, azimuth, and dip of all land-based drill collars were resurveyed to sub-centimetre accuracy by Ontario Land Surveyors J.D. Barnes Limited of Thunder Bay, Ontario.

For drill holes completed on ice, the collar survey data are only based on DGPS readings; the instrument has sub-metre accuracy.

11.6 Down-hole Surveys

Down-hole orientations of all drill holes are surveyed using a Reflex EZ-Shot® (EZ-shot) instrument. Readings are taken at the base of the hole, below the casing and at nominal 50 m intervals for the remaining length of the hole. Between September 2007 and December 2009, the orientation of all inclined drill holes were also been surveyed by a Reflex Maxibor II® (Maxibor) instrument, which is a non-magnetic multi-shot tool designed to be used in areas of magnetic rock. Maxibor surveys typically commence 10 m from the end depth of the drill hole with readings taken every 3 m from the starting point to the surface. The EZ-Shot instrument was used only used to provide a backup survey when the Maxibor instrument was used

From January 2010, the Magma staff geotechnicians surveyed vertical drill holes with a leased Reflex Gyro® (Gyro) down-hole tool. The Reflex EZ-Shot tool is used for back-up and quality control of the Gyro tool. The EZ-Shot measurements are taken at stations approximately every 50 m. The Gyro tool is initialized at the collar using a differential GPS manufactured by Advanced Public Safety (APS). The dip of the drill rods is checked with an inclinometer accurate to ±½°. The down-hole Gyro survey is conducted from the top of the hole down to the bottom, and another survey is performed from the bottom of the hole upwards with stations every 5 m for both in and out surveys.

The survey data are transferred from the tool to a laptop computer using Bluetooth® connectivity. The raw down-hole survey data are verified and processed using the Reflex Gyrosmart® software at the drill. The software data verification is capable of alerting the geotechnicians to most potential data quality issues before they depart the drill.

Prior to accepting the Reflex Gyro tool as the main down-hole survey instrument, Magma Metals compared its results to a DGI Geoscience north-seeking Gyro survey on five drill holes and found the results generated by the two tools to be comparable.

11.6.1 Bore-Hole Pulse Down-Hole EM Surveys

To provide sufficient coverage for Magma Metals to generate a planned three-dimensional (3-D) geophysical model for the Project, selected core drill holes have been surveyed using a pulse down-hole EM method and a three-axis magnetic survey. Drill holes are selected so as to provide data on 50 m x 50 m centres, such that there is sufficient overlap between data collection points to support eventual construction of a 3-D model.

A trial of the bore-hole MMR technique was performed by Crone Geophysics between April and June 2009.

11.7 Drill Spacing

Most of the first 41 drill holes completed within the Project, in the Current Lake Phases 1 and 2, and Beaver Lake Phase 1 programs, were inclined holes drilled at a variety of azimuths and dips. Many of the helicopter-supported core holes drilled from the shoreline of Current Lake consisted of a series of fans drilled from one location with as many as eight drill holes completed from a single set-up. The majority of the core holes completed since mid-February 2008 have been drilled vertically.

As a result, the bulk of the exploration drill holes are vertical holes drilled on section lines oriented across the strike of the intrusion. Approximately 14% of completed holes are inclined, although a number of the inclined holes were drilled under the base of the intrusion without intersecting it.

Prior to February 2008, drill pattern and density were not systematic and were designed to individually test specific magnetic anomalies. Since February 2008, drill holes have been sited along systematic section lines, and where possible, previous drill holes have been included within these section lines.

At Current Lake, the drilling has been completed along 50 m spaced section lines with core holes spaced at 10 m intervals on each section. The average drill section and spacing in the Current Lake Zone is 50 m and varies between approximately 30 m and 60 m. Within the Bridge Zone, drill spacing is typically on 50 m x 10 m spacings in the centre of the zone, widening to about 50 m x 20 m on the periphery. At one point, three lines have been drilled to provide 25 m x 10 m spacings. At the Beaver Lake zone, initial drilling was on 100 m x 50 m spacings, this was infilled to 50 m x 20 m spacings.

Drilling is normally perpendicular to the strike of the mineralization. Depending on the dip of the drill hole, and the dip of the mineralization, inclined drill intercept widths are typically greater than true widths, whereas, in the vertical drill holes, the drilled intercept approximates the true width. Because of the sub-horizontal tube-like nature of the Current and Bridge Zone portions of the conduit and the entrained, cloud-like nature of the mineralization the drill intercepts from vertical holes will be essentially true widths, no matter where the drill holes intersect the mineralization.

Drill orientations for both Current Lake and Beaver Lake Zones are generally appropriate for the mineralization style, and have been drilled at orientations that are optimal for the orientation of mineralization for the bulk of the deposit areas.

Example drill intercepts were included for the Current Lake, Bridge and Beaver Lake Zones in Figure 7-6 to Figure 7-10.

Example drill intercepts are summarized in Table 11-2 and Table 11-3 that are illustrative of nature of the mineralization within the Beaver Lake and Current Lake Zones respectively. The example drill holes in the figures in Section 7 and these tables also provide examples of non-mineralized intersections and areas of higher-grade in lower-grade intervals.

11.8 2010 Phase 9 Drill Program

Between the close-off date for the resource estimate update database of 31 May 2010, and the 07 February 2011 tabulation of the number of drill holes completed to date on the Project in Table 11-1, an additional 25 core holes were completed and assayed in the Phase 9 drill program. This program was designed to test bore hole EM anomalies associated with the known mineralization at the Beaver Lake zone. The program also included three abandoned drill holes, and a deepening of BL09-161.

Table 11-2: Example Intercept Drill Summary Table Beaver Lake Zone

Deposit	Drill Hole	Easting (m)	Northing (m)	Azimuth (°)	Dip (°)	From (m)	To (m)	Drilled Length (m)	Pt (g/t)	Pd (g/t)	Pt + Pd (g/t)	Cu (%)	Ni (%)	Pt + Pd Cut-Off Grade (g/t)
Beaver Lake	BL09-122	358101	5402524	0	-90	158.00	171.00	13.00	0.60	0.57	1.17	0.15	0.11	0.5
	including					159.00	161.00	2.00	1.04	0.96	2.00	0.25	0.14	1.0
	and					165.00	169.00	4.00	0.87	0.86	1.73	0.22	0.13	1.0
	BL09-123	358101	5402473	0	-90	134.00	154.00	20.00	1.01	0.92	1.93	0.20	0.16	0.5
	including					140.00	151.00	11.00	1.23	1.13	2.36	0.25	0.18	1.0
	including					144.00	147.00	3.00	4.02	3.58	7.60	0.70	0.30	3.0
	And					183.00	189.00	6.00	0.59	0.55	1.14	0.15	0.18	1.0
	BL09-127	358301	5402385	0	-90	240.00	257.00	17.00	0.96	0.86	1.82	0.18	0.16	0.5
	including					251.00	257.00	6.00	2.10	1.91	4.01	0.41	0.23	1.0
	including					253.00	255.10	2.10	4.56	4.13	8.69	0.89	0.46	3.0
	BL09-129					306.25	309.00	2.75	1.80	1.66	3.46	0.41	0.19	1.0
	BL09-131	358400	5402348	0	-90	239.00	259.00	20.00	0.82	0.75	1.58	0.18	0.21	0.5
	including					241.00	249.00	8.00	1.57	1.43	3.00	0.33	0.27	1.0
	And					271.00	276.55	5.55	0.86	0.80	1.66	0.19	0.14	1.0
	BL09-135	358502	5402350	182.7	-77.4	260.00	264.00	4.00	0.95	0.88	1.83	0.20	0.20	0.5
	BL09-136	358502	5402350	183.3	-74.4	276.00	294.00	18.00	0.97	0.89	1.86	0.20	0.22	1.0
	including					291.00	294.00	3.00	1.72	1.54	3.26	0.34	0.30	3.0
	And					324.00	327.00	3.00	0.71	0.65	1.36	0.14	0.15	1.0
	BL09-137	358501	5402400	0	-90	260.00	264.00	4.00	0.68	0.64	1.32	0.16	0.21	1.0
	And					269.00	286.00	17.00	1.21	1.16	2.37	0.26	0.21	1.0
	including					274.00	277.00	3.00	1.67	1.58	3.25	0.34	0.25	3.0
	And					291.00	293.45	2.45	1.25	1.18	2.43	0.33	0.18	1.0
	BL09-138	358502	5402539	0	-90	254.00	257.00	3.00	1.26	1.20	2.46	0.29	0.21	1.0
	BL09-139	358500	5402450	0	-90	148.00	153.00	5.00	0.88	0.86	1.74	0.25	0.14	1.0
	including					150.00	151.00	1.00	1.78	1.73	3.51	0.47	0.22	3.0
	And					258.00	266.30	8.30	0.90	0.84	1.74	0.21	0.18	1.0
	including					265.50	266.30	0.80	2.38	2.42	4.80	0.55	0.36	3.0
	BL09-142	358602	5402449	0	-90	291.40	293.90	2.50	1.73	1.45	3.18	0.53	0.19	0.5

Table 11-3: Example Intercept Drill Summary Table Current Lake Zone

Deposit	Drill Hole	Easting (m)	Northing (m)	Azimuth (°)	Dip (°)	From (m)	To (m)	Drilled Length (m)	Pt (g/t)	Pd (g/t)	Pt + Pd (g/t)	Au (g/t)	Cu (%)	Ni (%)	Pt + Pd + Au Cut-Off Grade (g/t)
Current Lake	TBND040	357003	5403702	0	-90	17.00	56.00	39.00	2.27	2.14	4.41	0.14	0.52	0.30	1.0
	including					23.30	30.00	7.00	3.00	2.91	5.91	0.19	0.68	0.33	5.0
	and					43.25	51.70	8.45	4.17	3.83	8.00	0.26	0.94	0.47	5.0
	TBND041	357129	5403596	0	-90	17.30	55.00	37.70	3.22	3.05	6.27	0.20	0.75	0.36	1.0
	including					17.30	38.65	21.35	4.20	3.99	8.19	0.26	0.91	0.40	5.0
	TBND043	357151	5403539	0	-90	34.00	34.70	0.70	28.90	25.50	54.40	2.94	4.13	0.41	5.0
	TBND045	357016	5403723	0	-90	17.50	60.80	43.30	1.14	1.11	2.25	0.08	0.28	0.20	0.5
	including					21.65	36.00	14.35	2.14	2.13	4.27	0.14	0.51	0.27	1.0
	and					52.00	55.00	3.00	2.06	1.96	4.02	0.15	0.55	0.34	1.0
	TBND046	357020	5403683	0	-90	43.00	48.00	5.00	0.77	0.75	1.52	0.05	0.20	0.20	1.0
	TBND047	357045	5403650	0	-90	21.90	30.00	8.10	1.33	1.21	2.54	0.09	0.30	0.21	1.0
	TBND049	357054	5403760	0	-90	36.00	40.00	4.00	0.77	0.72	1.49	0.05	0.20	0.20	1.0
	TBND050	357163	5403453	0	-90	16.20	17.75	1.55	0.98	0.89	1.87	0.06	0.19	0.20	1.0
	And					37.65	52.00	14.35	1.73	1.61	3.34	0.11	0.45	0.31	1.0
	And					37.65	40.10	2.45	2.63	2.45	5.08	0.17	0.65	0.37	5.0
	TBND051	357155	5403360	0	-90	21.35	42.35	21.00	0.84	0.78	1.62	0.05	0.18	0.17	0.5
	including					21.35	24.00	2.65	1.14	1.10	2.24	0.08	0.25	0.20	1.0
	and					33.45	39.45	6.00	1.70	1.55	3.25	0.11	0.35	0.23	1.0
	And					63.85	66.10	2.25	0.51	0.49	1.00	0.04	0.19	0.16	0.5

Review of the drilling that has both assay results and drill logs, indicated that the core holes intersected similar lithologies to those known from the existing drilling, and confirmed the local continuation of mineralization along strike from known mineralized intercepts. Although local changes to grade and lithological interpretations can be expected, the results of the drilling do not materially change the interpretations for the mineral resource estimate discussed in Section 17.

11.9 Fall 2010 Phase 10 Drill Program

The Phase 10 Beaver Lake program consisted of a 37 hole (8853 m) follow-up drill program to test 2 clusters of massive sulphide intercepts and associated DHEM anomalies between Beaver Lake Sections 357900E and 358150E (western Beaver Lake Zone) and was completed in mid-December 2010. The program was designed to better define the known massive and net-textured sulphide zones so that their continuity/connectivity could be established and their potential better evaluated. .

A two-hole, 2,229 m program was also completed in the northern South East Anomaly area. This program was in follow-up to an anomaly detected by a detailed ground gravity survey completed during the summer of 2010. The gravity anomaly directly connects with, and appears to be related to, the Beaver Lake portion of the Current Lake Intrusive Complex Locations of the two drill holes are shown earlier in Figure 10-3.

Analysis of the Phase 10 Beaver Lake drill core indicates that depths to mineralized intercepts, intercept widths, and appearance and intensity of the sulphide mineralization are similar to those reported for existing massive sulphide, net-textured, and disseminated sulphide intercepts in the Beaver Lake area. The drilling defined two massive-, net-textured, and heavily disseminated sulphide zones with strike lengths of approximately 40 m, widths of 10–20 m and thicknesses up to 2.6 m.

The easternmost core hole to test the gravity anomaly associated with the South East Anomaly reached a depth of 1,965 m. The first portion of this hole was drilled by a mid-sized drill rig that was not capable of reaching the targeted depth of the hole. When a drill rig that was capable of deeper drilling arrived on site, a second core hole was partially completed to a depth of 264 m, 450 m to the west as a shakedown test of the rig at shallower drill depths. When the shakedown was completed, the new drill moved back to the first drill hole and extended it to the target depth. No significant thicknesses of mafic/ultramafic intrusive rocks were intersected by the deep hole; however, numerous mafic to ultramafic sills were intersected between 1,000 m and 1,600 m depth.

11.10 Winter 2011 Reconnaissance Drill Program

A 53 hole, 9600m regional reconnaissance diamond drilling program commenced on the Thunder Bay North Project on 17 January 2011. As of the 17 March 2011 tabulation of drill holes a total of 47 holes had been completed, two were in progress, and one had been abandoned. This drilling was completed within the Current Lake, Current Lake South, South East Anomaly, and Lone Island Lake–East-West Connector areas of the project. The program was designed to test magnetic and EM geophysical targets located in areas that could only be drilled in the winter when lakes, streams, and swamps are frozen. Some analytical results have been received for the 47 completed holes but most were pending at the 17 March 2011 drill hole tabulation date.

11.11 AMEC Review of Drilling since Database Close-out Date

Drill holes completed within the area of the mineral resource estimate since the database close-out date of 31 May 2010 were reviewed by AMEC to determine any material changes to the mineral resource interpretations and estimate.

The lithologies encountered in this recent drilling confirmed the geological continuity as interpreted for the mineral resource estimate. However, the mineralization is locally more variable than predicted.

AMEC considers that the current geological and grade interpretations are acceptable for mineral resources supporting PA-level studies. A reassessment of mineralization continuity, in particular of the higher grade shell used in the current resource estimate, is warranted for the next mineral resource update.

AMEC is of the opinion that a probabilistic approach to modeling mineralization may provide an improvement over the current deterministic methodology for future studies.

11.12 Comment on Section 11

In the opinion of the QPs, the quantity and quality of the lithological, geotechnical, collar and down-hole survey data collected in the exploration and infill drill programs completed by Magma Metals are sufficient to support Mineral Resource estimation as follows:

- Core logging undertaken by Magma Metals meets industry standards for copper, nickel, cobalt, precious metals and PGE exploration within a magmatic sulphide-style setting.

- Collar surveys have been performed for the Magma Metals programs using industry-standard instrumentation.
- Down-hole surveys were performed using industry-standard instrumentation
- Recovery data, where recorded, from core drill programs are acceptable
- Drilling is normally perpendicular to the strike of the mineralization. Depending on the dip of the drill hole, and the dip of the mineralization, drill intercept widths are typically greater than true widths in inclined drill holes, and approximate the true widths in vertical drill holes.
- Drill orientations are generally appropriate for the mineralization style, and have been drilled at orientations that are optimal for the orientation of mineralization for the bulk of the deposit areas
- Drill orientations are shown in the example cross-sections (Figures 7-6 to 7-10), and can be seen to appropriately test the mineralization. The sections display typical drill hole orientations for the deposits, show summary assay values using colour ranges for assay intervals that include areas of non-mineralized and very low grade mineralization, and outline areas where higher-grade intercepts can be identified within lower-grade sections. The sections confirm that sampling is representative of the copper, nickel, cobalt, precious metals and PGE grades in the deposits, reflecting areas of higher and lower grades.
- Drill hole intercepts as summarized in Table 11-2 and Table 11-3 appropriately reflect the nature of the copper, nickel, cobalt, precious metals and PGE mineralization.
- No material factors were identified with the data collection from the drill programs that could affect Mineral Resource estimation.

12.0 SAMPLING METHOD AND APPROACH

12.1 Geochemical Sampling

The initial geochemical sampling on the Project area has been superseded by the core data, and is not discussed further.

A test program of HMC and lake sediment surveys was undertaken in 2009. Samples typically weighed about 20 kg.

For the 2010 HMC program, sample media consisted of coarse sandy sediment screened in the field to <6 mm in 10–15 kg samples. A 1-2 kg fine-fraction (<1 mm) sub-sample was also screened and collected at each site.

Lake bottom samples were acquired using a steel sediment corer following the sampling protocols of the Ontario Geological Survey. Approximately 1 kg samples of dark brown organic-rich mud were collected at each station.

12.2 Core Sampling

Core samples are taken on 2 m intervals in rocks that are considered to be non-mineralized. Mineralized intersections are sampled on 1 m intervals. Both sample intervals may be irregular in the areas of mineralized/non-mineralized contacts; sampling in these instances is left to the judgement of the supervising geologist. However, every effort is made to have the irregular interval within the non-mineralized core, rather than in the zone of mineralization.

Single samples are not taken. Samples must be bracketed on either side by at least one additional sample for a minimum of three samples. A buffer of at least two samples (4 m) is required to be sampled above and below all peridotite and hybrid intervals as well as associated mineralization. In zones of poor recovery, some sample intervals may reach as much as 3 m, or the length of the drill run.

Drill core was received and laid out for logging and sampling at the core logging facility. Core is split into halves using a core saw. One half of the core is placed into a labelled sample bag; the remaining half is replaced in the core box as a record.

If broken or ground core is encountered, an attempt is made to sample approximately 50% of the resulting mass. The interval is noted for sampling purposes as having been broken or ground.

Four to six samples are collected into a rice bag; with the rice bags stored in the core cutting area until a batch of about 100 samples is ready. Samples are sent to the assay laboratory upon completion of the sampling of each drill hole. If greater than 100 samples are taken from a single hole, then those samples are split by Magma Metals staff into multiple batches of 100 samples or less. Each sample batch is given a unique sample dispatch number and a photocopy of each sample submission sheet is placed within a plastic bag and inserted into the first rice bag of the shipment.

A Magma Metals staff person then drives all of the rice bags containing samples from a single core hole by vehicle to the ALS Chemex preparation laboratory located in Thunder Bay, Ontario. All samples remain in the custody of appropriately qualified staff within a secure location until given directly to ALS preparation laboratory personnel.

12.3 Density/Specific Gravity

The density database totals 4,494 measurements in mineralized material, and an additional 448 measurements in wall rock.

Initial data were measured by ALS Chemex in Vancouver, Canada, using a pyncnometer; these data were discarded and are not used in mineral resource estimation.

Magma Metals personnel completed the remaining specific gravity testwork. No voids or porous materials were included in the material that was measured. Samples were conventionally weighed in air and then in water, with the specific gravity calculated via the formula:

$$SG = \frac{\text{Weight in Air}}{(\text{Weight in Air} - \text{Weight in Water})}$$

Table 12-1 shows the average specific gravity values for the various lithologies.

A linear regression equation for the density was developed to inform the blocks in the block model, and is discussed in Section 17 of this Report.

Table 12-1: Specific Gravity Testwork Summary Table

Rocktype	Count	Average	Minimum	Maximum
Ultramafic	1,709	2.92	2.53	4.17
Ultramafic	2,766	2.94	2.49	4.07
Massive Sulphide	19	3.72	2.93	4.43
Sediments	170	2.71	2.55	3.04
Granite	110	2.61	2.51	2.94
Hybrid	148	2.75	2.52	3.05
Taxite	9	2.58	2.51	2.69
Ultramafic and gabbro	11	2.83	2.62	2.96
Total all samples	**4,942**			

12.4 Comment on Section 12

A description of the geology and mineralization of the deposit, which includes lithologies, geological controls and widths of mineralized zones, is given in Section 7 and Section 9.

A description of the sampling methods, location, type, nature, and spacing of samples collected on the Project is included in Section 10 and Section 12.

A description of the drilling programs, including sampling and recovery factors, are included in Section 11 and Section 12. All collection, splitting, and bagging of core samples were carried out by Magma Metals personnel. No material factors were identified with the drilling programs that could affect Mineral Resource estimation.

Figure 11-1 and Figure 11-2, which show drill hole collar locations for the Current Lake and Beaver Lake/Bridge zones respectively, indicate that the sizes of the sampled areas are representative of the distribution and orientation of the mineralization.

Figure 7-6 to Figure 7-10 show approximate drill hole collar traces in relation to the orientation of the mineralization. The figures, using the bar thicknesses depicted on each drill trace, also show drill hole assay intervals include areas of non-mineralized and very low grade mineralization, and confirm that sampling is representative of the base metal, precious metal, and PGE grades in the deposit, reflecting areas of higher and lower grades.

Data validation of the drilling and sampling program is discussed in Section 14, and includes review of database audit results.

In the opinion of the QPs, the sampling methods are acceptable, meet industry-standard practice, and are adequate for Mineral Resource and Mineral Reserve estimation and mine planning purposes, based on the following:

- Data are collected following Project-approved sampling protocols;
- Sample collection and handling core was undertaken in accordance with industry standard practices, with procedures to limit potential sample losses and sampling biases. Core handling facilities are suitable for the logging and sampling of drill core;
- Sample intervals, comprising variable 1 m intervals in mineralized core and 2 m intervals in non-mineralized core, are considered to be adequately representative of the true thicknesses of mineralization.
- Specific gravity determination procedures completed by Magma Metals are consistent with industry-standard procedures.

AMEC notes that Magma Metals currently does not have a set of written procedures for core cutting, handling and chain-of-custody. AMEC concluded, following a site visit that sample handling and custody procedures were acceptable for preventing unintentional sample sequence errors and sample tag switches; however, AMEC recommends Magma Metals develops and documents procedures for core cutting, handling, and chain-of-custody to prevent both accidental and intentional sample manipulation.

AMEC recommends that Magma Metals perform some wax immersion test work to confirm that the porosity of the rock has no material impact on the specific gravity values.

13.0 SAMPLE PREPARATION, ANALYSES, AND SECURITY

From Project inception to date, Project staff employed by Magma Metals were responsible for the following:

- Sample collection
- Core splitting
- Density determinations
- Sample storage
- Sample transport
- Sample security.

13.1 Analytical Laboratories

13.1.1 Geochemical Samples

Overburden Drilling Management, located in Ottawa, Ontario, is an independent laboratory that specializes in heavy mineral geochemistry and indicator mineral exploration. The laboratory holds a Certificate of Authorization from the Association of Professional Geoscientists of Ontario.

ALS Chemex is a well-established and recognized assay and geochemical analytical services company, and is independent of Magma Metals. The Vancouver facility used for geochemical sample analysis holds ISO-17025 registration.

13.1.2 Drill Samples

Between December 2006 and September 2007 all Magma Metals samples were sent to the Accurassay Laboratory facility (Accurassay) in Thunder Bay, Ontario. Accurassay is a well-established and recognized assay and geochemical analytical services company, and is independent of Magma Metals. The analytical facility holds ISO-17025 registration. Accurassay was also used in 2006 to prepare a standard reference material (SRM) based on local boulder material.

Since September, 2007, all sample preparation and analysis has been performed by ALS Chemex, at the preparation facility in Thunder Bay, and primary assay laboratory in Vancouver, B.C. ALS Chemex is a well-established and recognized assay and geochemical analytical services company, and is independent of Magma Metals. The

Thunder Bay laboratory holds ISO-9000 accreditation; the Vancouver facility holds ISO-17025 registration.

The check assay laboratory for the period September 2008 to June 2009 was Activation Laboratories (Actlabs), based in Ancaster, Ontario. Actlabs is independent of Magma Metals, and holds ISO-17025 registration.

Agat Laboratories Ltd (Agat) of Mississauga, Ontario, was the check assay laboratory from June 2009 to October 2010. The laboratory is accredited by the Standards Council of Canada (SCC) and/or the Canadian Association for Laboratory Accreditation Inc. (CALA), and meets the ISO/IEC 17025 (CAN-P-1579) and the ISO 9000 series of Quality Management standards. Agat is independent of Magma Metals.

Acme Analytical Laboratories (Vancouver) Ltd. (Acme) became Magma's check assay laboratory in November 2010. The laboratory presently holds ISO 9001 accreditation and is working toward ISO17025:2005 accreditation (which it expects to achieve in 2011). Acme is independent of Magma Metals.

13.2 Geochemical Sampling

HMC samples were submitted to Overburden Drilling Management of Ottawa ON for magmatic massive sulphide indicator mineral (MSIM) analysis coupled with platinum group element (PGE) and gold screening. The fine fraction sub-samples were submitted to ALS Chemex for drying, screening to 180 µm, followed by fire-assay for platinum, palladium and gold (PGM-MS23) and four-acid "near-total" digestion ICP-MS (ME-ICP61) for a suite of 33 elements. Control samples including standards were inserted into the sample stream for quality control and assurance.

Lake-bottom samples were submitted to ALS Chemex where they were dried in a low-temperature oven, screened to 180 µm then assayed by fire-assay for platinum - palladium-gold (PGM-MS23) and aqua-regia "partial" digestion ICP-MS (ME-MS41) for a suite of 33 elements. Control samples including standards, duplicates and blanks were inserted into the sample stream for quality control and assurance.

No results of the programs are available at the effective date of the Report.

13.3 Core Sample Preparation

Sample preparation was performed by Accurassay on initial core holes TBND001 to TBND034 at the Thunder Bay Accurassay laboratory. All samples were dried prior to any sample preparation. Once dry, samples were crushed to 90% -8 mesh, split into

250 g to 500 g sub-samples using a Jones Riffler and then pulverized to 90% -150 mesh using a ring and puck pulverizer. Prior to analysis, samples were homogenized. Silica cleaning was completed between each sample to prevent cross-contamination.

From September 2007, sample preparation was performed by ALS Chemex in Thunder Bay. All samples are bar coded on arrival at ALS Chemex for entry in the Laboratory Information Management System (LIMS). This system provides complete chain-of-custody records for every stage in the sample preparation and analytical process from the moment that a sample arrives at the laboratory.

On receipt, samples are weighed, dried at 110°C to 120°C, crushed using a jaw crusher to >50% passing 1 mm, riffle split to generate a 250 g sub-sample, and pulverized to >85 percent less than 75 µm.

13.4 Core Sample Analysis

Sample analysis performed by Accurassay comprised:

- Method Code AL4APP: Fire assay with atomic absorption (AA) finish for Au, Pt, Pd with detection limits of 5 ppb, 15 ppb, and 10 ppb respectively.
- Method Code AL4CNC: Aqua regia digest with AA finish for Cu, Ni, Co with detection limits of 1 ppm each.

At ALS Chemex, gold, platinum and palladium are analysed using a fire assay with an inductively coupled plasma mass spectrometry (ICP-MS) finish (method code: PGM-ICPMS23). Detection limits are Au: 0.001 ppm to 1 ppm; Pt: 0.0005 ppm to 1 ppm; and Pd 0.001 ppm to 1 ppm. Samples that have grades above the optimal ICP-MS detection limits are analysed using an optical emission spectroscopy method (ICP-OES; method code PGM-ICP27 “ore grade”). Detection limits for this method are Au: 0.03 ppm to 100 ppm; Pt: 0.03 ppm to 100 ppm; and Pd 0.03 ppm to 100 ppm.

Multi-element and base metals are analyzed using a multi-element atomic emission spectroscopy (ICP-AES; method code ME-ICP61) technique following four-acid digest of the sample. This analytical method reports 33 elements, including silver, chromium, copper, nickel, and cobalt. Detection limits are summarized in Table 13-1.

When samples have grades above the optimal detection limits for the analytical method, they are re-analysed, using an ore-grade method (methods Cu-OG62 and Ni-OG62. A similar acid digest to that initially used is performed, followed by either ICP-AES or atomic absorption spectrometry (AAS) techniques. Detection ranges for Cu are 0.001% to 40%, and detection ranges for Ni are from 0.001% to 30%.

Table 13-1: ICP-AES Method Detection Limit Elements and Ranges in ppm for ME-ICP6

Element	Range	Element	Range	Element	Range	Element	Range
Ag	0.05–100	Co	1–10000	Mo	1–10000	Sr	1–10000
Al	0.01–50%	Cr	1–10000	Na	0.01–10%	Th	20–10000
As	5–10000	Cu	1–10000	Ni	1–10000	Ti	0.01–10%
Ba	10–10000	Fe	0.01–50%	P	10–10000	Tl	10–10000
Be	0.5–1000	Ga	10–10000	Pb	2–10000	U	10–10000
Bi	2–10000	K	0.01–10%	S	0.01–10%	V	1–10000
Ca	0.01–50%	La	10–10000	Sb	5–10000	W	10–10000
Cd	0.5–1000	Mg	0.01–50%	Sc	1–10000	Zn	2–10000
		Mn	5–10000				

13.5 Quality Assurance and Quality Control

13.5.1 Program History

Magma Metals began implementing formal analytical quality control measures when submitting samples to the primary laboratory early in the Project drill programs by inserting a single barren diabase blank and a single standard reference sample into the sample stream for every 40 samples. During mid-2007 the diabase blank was replaced by a silica blank and by the end of 2007 a field duplicate sample was added to the quality control sample stream for every 40 samples. In late 2009, a single coarse marble blank was inserted in each sample batch.

During 2008, when submitting samples to the primary laboratory, a second standard reference material (SRM) sample was added to the sample stream for every 40 samples. A minimum of one nickel-copper control sample and one platinum–palladium control sample was required in all sample series within the ultramafic to mafic intrusive rocks. A qualified geologist decided on which platinum–palladium control sample was to be inserted based on presumed grade of the surrounding material. Early in 2009, Magma Metals discontinued use of SRMs and began using only certified reference materials (CRMs).

Magma Metals initially requested that ALS Chemex send a duplicate pulp sample to Actlabs directly for one in every 33 samples. In 2009, this was amended to two coarse reject duplicate samples in every 40-sample batch.

13.5.2 Current Procedures

Magma Metals geologists follow a documented procedure for the insertion of control samples in the drill core sample stream. At present the insertion of control samples is based on the following criteria:

- Interval of ultramafic to mafic intrusive rock with greater than 30 samples: A CRM, blank (marble or duplicate is inserted on every 10th sample in the following order: CRM, blank, CRM, and duplicate. The cycle repeats every 40 samples, thus ensuring that 10% of samples submitted are control samples.
- Interval of ultramafic to mafic intrusive rock with less than 30 samples: A minimum of two CRMs and a blank are required for the sample series. This typically results in greater than 10% control samples for the drill hole. It is at the discretion of the geologist where to place the control samples within the sequence. The preference is to have the control samples at even spacings throughout the sequence, such that control samples are never placed back to back within the sample sequence.
- Sample sequences consisting of hybrid and other non-ultramafic material with less than 30 samples: A minimum of one control sample (CRM or blank) is required within the sample series. If possible, control samples are submitted as every 10th sample.
- A minimum of one Ni–Cu CRM and one Pt–Pd CRM is required in all sample series within the ultramafic to mafic intrusive rocks. The qualified geologist decides on the Pt–Pd CRM to be inserted based the geological interpretation of the presumed grade of the surrounding material.

The insertion procedure results in a minimum of 11% to 12% control sample frequency depending on the length of the sampled interval. In addition to the control samples 5% of samples are submitted to another assay laboratory, currently Acme, as check assays.

The current CRMs are the AMIS0124 and AMIS0064 standards, produced by African Mineral Standards, an independent laboratory owned by SetPoint Technology, which specialises in multi-metal, matrix-matched, standard reference materials. Best values for the standards are based on measurement campaigns that used independent analytical laboratories.

The current blanks are the BL109 powder and landscape marble. A certificate is available for the BL109 standard and Magma Metals has non-certified assays for the marble.

13.6 Database

All Project data are stored and maintained in the form of a GBis database. OCRIS core logs are designed to be imported into GBis.

Data from logging are manually entered into OCRIS, and then uploaded from OCRIS to the database. Assays are imported from *.sif* files provided by the assay laboratories. Specific gravity data are imported into the database from files where the readings have been manually entered. The down-hole survey data are exported from the software provided by Reflex Instruments, and then cut-and-pasted into a template that is imported into the database.

The Project database is under the supervision of one database manager who has the knowledge and authority to ensure database integrity. The data-entry process follows a well-defined procedure. All data are visually inspected and validated prior to integration into the Project database by the database manager in Thunder Bay.

13.7 Sample Security

Sample security relied upon the fact that the samples were always attended or locked in a sample dispatch facility. Sample collection and transportation have always been undertaken by company personnel using company vehicles. Chain-of-custody procedures consisted of filling out sample submittal forms that were sent to the laboratory with sample shipments to make certain that all samples were received by the laboratory.

13.8 Sample Storage

A fenced and gated storage facility at the Project site was built late in 2010 and most on-site stockpiled core was moved to the new secure facility by year-end 2010. The remaining on-site stockpiled core is in the process of being moved to the new facility and should be onsite by the end of the winter 2011 reconnaissance drill program.

All Project coarse rejects are stored within Magma's fenced, gated, and secure core storage facility in Thunder Bay. All Project pulps are stored within a locked storage container stored within a gated compound in Thunder Bay.

13.9 Comment on Section 13

In the opinion of the QPs, the following conclusions can be reached for the sample preparation, analysis, QA/QC and sample security aspects of the Project:

- Drill sampling has been appropriately spaced to first define, then infill, base metal and PGE anomalies to produce prospect-scale and deposit-scale drill data.
- Sample preparation for core samples has followed a similar procedure since September 2007. Preparation procedures since September 2007 are in line with industry-standard methods, and suitable for the magmatic sulphide deposit style.
- Sample preparation, analytical and QA/QC procedures have been undertaken by independent laboratories over the duration of the drilling programs.
- QA/QC programs comprised insertion of blank, duplicate and SRM, later CRM, samples. During the 2009 site visit, AMEC noted that "pulp duplicates should be inserted into the sample stream at the laboratory. This check is important as it provides the best opportunity for determining precision analysis at the final stage of sample preparation. If the volume of pulp is insufficient to support the testing, AMEC recommends Magma Metals request to ALS Chemex to make up sufficient fine pulp to perform the insertion." Magma Metals requested the change of ALS Chemex, and advised AMEC that as of the Report effective date, such pulps were being included in the sample stream.
- The QA/QC program results do not indicate any problems with the analytical programs, therefore the analyses from the core drilling are suitable for inclusion in Mineral Resource estimation.
- Data incorporated in databases have been checked for errors, and the database is considered sufficiently error-free to support Mineral Resource estimation.
- Sample security has relied upon the fact that the samples were always attended or locked in appropriate sample storage areas prior to dispatch to the sample preparation facility. Chain-of-custody procedures consist of filling out sample submittal forms that are sent to the laboratory with sample shipments to make certain that all samples are received by the laboratory.
- Current sample storage procedures and storage areas are consistent with industry standards.

14.0 DATA VERIFICATION

Data verification programs were performed by SRK Consulting in 2009, in support of a first-time mineral resource estimate, and in 2010, by AMEC, in support of an updated estimate and scoping-level studies.

14.1 AMEC Site Visits

Greg Kulla of AMEC visited the Magma Metals Thunder Bay office and Thunder Bay North Project exploration camp during the week of November 23 to 27, 2009. During the site visit, he reviewed a number of activities and processes related to the drilling program, core logging, core sampling, geological interpretation and data management. From April 12 to 15, 2010, Peter Oshust, also of AMEC, and under the direction of Mr Kulla, visited the site and reviewed the drill program.

Findings from the site visits included:

- Drilling was being completed in a professional manner in accordance with industry accepted practices.
- No misplaced holes were observed among the checked drill hole collars. AMEC considers the collar survey methods and accuracy to be good, based on these checks.
- AMEC is of the opinion that the drill hole abandonment procedures are consistent with industry norms.
- Geological logging was acceptable. There is some inconsistency in picking the contacts between gradational units such as the altered partial melt granitoid and the hybrid or between the ultramafic units. In addition, there is some inconsistency in the visual estimates of sulphides. The estimates provide an indication of prospective grade and are used only until assays are returned. AMEC considers these inconsistencies to be minor as the lithological classification and metal content can both be determined quantitatively from metal and whole rock analyses.
- AMEC recommends Magma Metals develops suite of representative reference cores for the Project lithologies and mineralization types for reference, so as to improve consistency in rock type nomenclature and estimation of percentage of sulphide minerals.
- AMEC recommends Magma Metals develops and implements a full geotechnical core logging program to prepare for mine design and development.
- No hydrogeological core logging is currently being carried out for the Project. It is important that for future, more detailed studies, Magma Metals and its consultants

understand the hydrogeological system, and have incorporated into mine design a capacity to act upon potential water inflows if warranted. AMEC recommends the development and implementation of hydrogeological core logging procedures to be undertaken in conjunction with geotechnical core logging.

- AMEC recommends Magma Metals sends 20 samples per mineralized rock type and major country rock type likely to be mined to an independent laboratory for moisture and wax immersion testing to support the data from Magma Metals' own testing.

14.2 Database Verification

AMEC reviewed the database construction, performed checks to confirm internal consistency, and audited portions of the assay and lithology tables. Each table and the verification procedures are discussed in the following sub-sections.

14.2.1 Collar Table

The collar table contains location data for the collars of the drill holes. The collar locations were compared to a listing of collar locations provided by the surveying contractor. AMEC noted one discrepancy in a northing for one hole and a number of discrepancies in elevations that turned out to be due to the fact that the top of the casing had been surveyed, and the final table did not reflect the difference between the casing elevation and the ground surface elevation. No other discrepancies were noted.

Subsequently, Magma Metals staff made the adjustments and provided the corrected table to AMEC for the purposes of the mineral resource estimate.

14.2.2 Down-hole Survey Table

Original data for down-hole surveys were not provided to AMEC. AMEC performed checks for internal consistency using proprietary software and manual checks. A number of issues were identified and are discussed in the section on QA/QC (refer to Section 14.2.3).

14.2.3 Assay Data

AMEC retrieved the Project data directly from ALS Chemex using Webtrieve using the user name and password provided by Magma Metals. AMEC then compiled the data into a new database and compared that database to the database provided by Magma Metals. This allowed AMEC to audit approximately 83% of the assay data.

Accurassay data were not audited. A total of 22 holes were involved (3.5% of the assays) and only one was in material that may be considered mineralized.

AMEC noted a number of discrepancies between the compiled assay data and those provided by Magma. Those discrepancies, with rare exception, are believed to result from missing assay certificates in AMEC's compilation. The missing certificates are believed by AMEC to represent the results returned during QA/QC re-assaying. The results in the Magma Metals data are within a few relative percent of the results in AMEC's compilation leading to that conclusion. AMEC did note five errors that are not explained by missing assay certificates. Two errors resulted from swapped samples and three are unexplained. The error rate (0.11%) is very small and considered to be acceptable. AMEC is of the opinion that the assay data are acceptable to support resource estimation.

14.2.4 Lithology Data

AMEC compared 14 original drill logs to the entries in the database. There are a large number of discrepancies that appear to be undocumented re-interpretation of lithology codes. AMEC has discussed this with Magma Metals and the database indeed contains updated lithology codes. It is normal for lithology codes to evolve as a Project advances; AMEC's only concern is that there is little in the way of documentation for the changed codes.

Most of the lithology codes are not used in the geological model where the ultramafic body is outlined by wire frames. The re-interpreted codes are consistent with the descriptions of the new codes and are believed by AMEC to be adequate to support resource estimation.

However, AMEC recommends that Magma Metals implement a procedure for documenting any changes made in lithology codes.

14.3 Quality Assurance and Quality Control – Drilling

14.3.1 Collar Surveying

AMEC is unaware of any collar survey QA/QC procedures.

14.3.2 Down-hole Surveying

AMEC first used a proprietary program to identify any unusual bends (“kinks”) in the down-hole survey trajectories. For this review, AMEC set the limit of deviation at 3° in 20 m which is a moderate change in the trajectory of the hole. Only drill hole, BL09-134 could be considered to be outside of the tolerance limits; however, this drill hole does not intersect significant mineralization.

As many as five different down-hole survey instruments were utilized for the purposes of this work including Reflex EZ-Shot, Reflex MaxiBor II, Reflex Gyro, Radtool, and Theodolite for the collar orientation.

AMEC reviewed the down-hole surveys manually looking for inconsistent dips or azimuth directions. Inclinations appear to be consistent between down-hole survey methods. Azimuths, on the other hand, appear to vary between methods.

AMEC compiled twin survey data from a number of holes where Reflex EZ Shot and Maxibor, Radtool, or Reflex Gyro data were available. These data indicate that there may be a serious bias between the Reflex and Radtool tools and other tool types.

For dips, there are few biases and, in most cases, dips are indistinguishable between survey types. Azimuths are different. The largest bias is between the Radtool and the Maxibor tool. This discrepancy appears to be on the order of 10° which is considered by AMEC to be unreasonable. Radtool data were only used for seven holes in the resource estimate and of those, only TBND-001 was significantly mineralized. That mineralization was shallow, and a small bias in the azimuth will have little impact on the location of the mineralization. The bias in the Radtool thus appears to have an insignificant impact on the mineral resource estimate.

There appears to be a 5–7° bias between Reflex and Maxibor surveys, but the biases are not consistent between holes. AMEC notes that the Reflex tool sometimes exhibits erratic behavior. From the data, AMEC suspects that the problem is caused by magnetite in the wall rock, but cannot confirm that.

Approximately 376 holes were surveyed with a Reflex tool. Of those, 338 are vertical or near-vertical holes where azimuth deviations are minimal. In the case of erratic behavior of the Reflex tool, incorrect deviations will have little or no impact on the location of mineralization because the holes remain vertical and changes in azimuth have little impact on the trajectory of the hole. AMEC anticipates little impact on the mineral resource estimate from these holes.

AMEC found 38 angle holes in the database that were surveyed with a Reflex tool. Of those, only eight intersected significant mineralization and most were scattered low-grade material. If the bias is 5–7^{o}, the location of mineralization in holes BL08-68, BL08-16 and BL08-09 would be impacted and would have a small, local impact on the mineral resource estimate. The other angle holes (35 total) have no impact on the mineral resource estimate because they largely intersect waste.

Although AMEC noted possible biases between the different types of down-hole survey tools, the impact of those biases on the mineral resource estimate are considered to be minimal. AMEC recommends that the source of the biases be investigated and eliminated, if possible. All of the down-hole survey tools used by the Project are in common use in the industry and typically do not exhibit biases.

14.4 Quality Assurance and Quality Control – Sample Preparation

AMEC did not review any QA/QC data for sample preparation procedures; AMEC does not consider that this presents a risk to the mineral resource estimate.

14.5 Quality Assurance and Quality Control – Assay QA/QC

Magma Metals routinely inserted blank, standard, and coarse duplicate samples into the sample stream to monitor quality control (Magma Metals, 2010). The QA/QC data were monitored closely and remedial action taken when results were outside acceptable limits.

14.5.1 Blank Samples

Blanks are inserted at a rate of about one in twenty samples, or more. AMEC reviewed the data using control charts. The failure rates (five times lower detection limit) are within expected limits; however, minor contamination is indicated by the results. AMEC believes that the level of contamination is not significant and will not adversely impact the mineral resource estimate. Cu and Ni appear to be infrequently contaminated to a level of about 50 ppm which is not significant. Blanks BL 109, Marble, and Silica appear to have a Cu background of about 15 ppm. Blank Marble has a Ni background of about 10 ppm and an erratic S value which may be due to sulphides or sulphates in the Marble. No contamination or background values were noted for precious metals.

14.5.2 Standard Samples

Standards were inserted at a rate of approximately one in 15 samples. The insertion rate is appropriate. AMEC reviewed the data on quality control charts to evaluate possible biases, trends to the data, and to identify standard results that were considered to be failures. AMEC considers a result to have failed if that result is outside three standard deviations from the mean of the data. No significant trends were noted in any of the data and the failure rate was considered acceptable. AMEC compared the failed samples identified in this exercise to the failed results logged by Magma and the results were consistent.

AMEC noted a number of biases that are outside AMEC's acceptance level of ±5%. Most of the results that are outside the limit are due to the low grade of the samples and are not considered by AMEC to be a significant problem.

14.5.3 Duplicate Samples

Duplicate samples are analyzed to monitor precision in the analytical process, including sample preparation. Magma Metals routinely analyzed quarter-core samples as a coarse duplicate. These samples provide information about the geological variance of the mineralization and possible sampling bias. AMEC received no data for pulp duplicate samples which are normally used to monitor analytical precision.

AMEC uses graphical and other methods to evaluate the precision of duplicate sample pairs, which are based on the absolute relative difference (ARD) between the duplicate results where ARD is defined as:

$$ARD = \left| \frac{a-b}{\frac{a+b}{2}} \right|$$

and where *a* and *b* are the samples in the sample pair.

Because the precision near the lower detection limit is generally ±100%, values used for this plot are restricted to those that are more than 30 times the lower detection limit. Precision estimates for the assays in question are standardized at the 90th percentile of the ARD for samples with average grades >30 times the lower detection limit.

AMEC also reviewed the data for duplicate pairs that had one assay that was considered to be an outlier, in other words, precision for the pair was outside reasonable limits. Precision is typically measured using pulp duplicates which were not part of Magma's QA/QC program until late September 2010.

AMEC also used duplicate data to estimate a lower detection limit (LDL). Coarse materials are not ideal for that purpose; however, the estimated values are generally close to the reported values and are adequate to support resource estimation.

In summary, considering that these are coarse (quarter-core) duplicate samples:

- Ag and Cu are somewhat outside the ±25% that AMEC considers a reasonable limit.
- For Ag, the nature of the problem remains unclear. Part of the issue is the fact that the lower detection limit (LDL) is about 0.5 ppm and only three data pairs exceed 30 x LDL.
- For Cu, the effective LDL is about 10 ppm which is 10 x that reported by the laboratories. This is largely due to the poor precision at this concentration. When 10 ppm is used for the LDL, precision is about 26.5% which is close, but still outside AMEC limits.
- If either Ag or Cu become a significant contributor to the revenues of the deposit, the sample preparation procedures should be investigated with the goal of improving precision for these two elements.
- All other elements are within AMEC limits for precision for coarse duplicate samples.
- AMEC evaluated the LDL for each element except S. Silver, Au, Co, and Ni are very close to the values indicated by the laboratories.
- Effective LDL for Pd and Pt are somewhat higher than indicated by laboratories, but are reasonable for Pd and Pt.

AMEC concludes that it is difficult to accurately determine the precision for all elements using the field duplicates and recommends that the inclusion of within-batch pulp duplicates be instigated as part of any future QA/QC procedures. A retroactive pulp check program is warranted to better understand the precision associated with the samples.

14.6 Quality Assurance and Quality Control – Density (Specific Gravity)

AMEC is unaware of wax coated water immersion checks being completed to allow an assessment of the possible impact of porosity on the determined SG. Due to the low porosity of the rock the risk associated with this is considered to be low. AMEC recommends that a wax coated water immersion program be undertaken and that one in 20 samples be sent to a second laboratory for verification analyses.

14.7 Comment on Section 14

The process of data verification for the Project has been performed by AMEC and SRK, consultants who are independent of Magma Metals.

Conclusions and recommendations arising from the data verification programs include the following.

The collar, assay, and lithology data are adequate to support mineral resource estimation. AMEC noted some opportunities for improvements in all of these tables that should be addressed prior to completion of detailed Project studies.

Identified discrepancies in the down-hole survey data are troublesome. AMEC cannot ascertain, from the data provided, which type of down-hole survey is accurately measuring the azimuth of the hole. Most of the discrepancies will only result in location discrepancies of a few meters (<10 m), at most, but some discrepancies may be larger. The biases between the survey types result in significant uncertainty as to the location of the holes.

As a result, AMEC believes that the data are useable, but will restrict resource classification below about 100 m to the Inferred classification, at best, in the area of angled drill holes because of the uncertainty of the location of the information. Vertical holes are not so dependent on azimuth corrections and will not be affected by this restriction. The data will support a scoping (preliminary assessment) study but should be investigated and corrected prior to undertaking a pre-feasibility study.

Analytical QA/QC data indicate that the assay data are sufficiently accurate and precise to support mineral resource estimation. Additional data such as pulp duplicate data would allow for more reliable estimates of precision and lower detection limits. AMEC notes that Magma Metals have commenced addition of pulp duplicates to the sample stream with the current drill program.

The QPs, who rely upon this work, have reviewed the appropriate reports, and are of the opinion that the data verification programs undertaken on the data collected from the Project adequately support, with the qualifications noted, the geological interpretations, the analytical and database quality, and therefore support the use of the data in mineral resource estimation.

15.0 ADJACENT PROPERTIES

There are no immediately adjacent properties that are at the same stage of development as the Thunder Bay North Project.

16.0 MINERAL PROCESSING AND METALLURGICAL TESTING

The metallurgical process design was prepared by Rod McElroy, Ph.D., an AMEC employee, with the collaboration of Lynton Gormely, Ph.D. P.Eng., also an AMEC employee. Dr. Gormely is the Qualified Person for the metallurgical process work.

16.1 Metallurgical Testwork

Testwork was performed by the following metallurgical testwork facilities:

- SGS Canada, Lakefield, ON (SGS Lakefield)
- Xstrata Process Support, Falconbridge, ON (XPS)
- G&T Metallurgical Services, Kamloops, BC (G&T).

All three facilities are independent of Magma Metals, and are recognised testing facilities, although not certified; this is typical for metallurgical testing facilities.

16.1.1 Mineralogy

Work performed by XPS focused exclusively on mineralogy, utilizing Qemscan and electron probe microanalysis (EPMA) methodologies. G&T, concentrated on beneficiation with supporting mineralogy work.

The two studies agree on the relative abundance of major sulphides, as follows:

pyrite > chalcopyrite > pyrrhotite > pentlandite

However, quantitative agreement is poor and extensive petrographic studies conducted by Magma Metals indicate that pyrrhotite is the dominant sulphide mineral and pyrite is generally confined to the margins of the intrusion. Neither study scope included a detailed investigation of PGM mineralogy, although the G&T study reports the presence of PGM as small metallic grains, liberated and variously associated.

16.1.2 Comminution

Comminution testwork was performed by SGS. Samples fell in the moderately hard to hard range of hardness for all the indices. The Main sample was mildly abrasive.

SGS high-pressure grinding roll (HPGR) results were reviewed by AMEC in the context of a database of similar preliminary and advanced results, to evaluate the potential advantages for use of this technology. A HPGR may be an option for the tertiary crushing stage which may bring the opportunity for operating capital (opex) savings due to its known, greater efficiency. However, due to the nature of the test (laboratory scale) and the lack of roll surface abrasiveness tests, this option was not investigated further at the current stage of evaluation.

The comminution test results were used by AMEC to generate a model for the evaluation of comminution options and the selection of an optimal circuit for preliminary design. The selected circuit consists of a three-stage crushing circuit followed by closed circuit ball mill.

16.1.3 Concentration

Concentration testwork was conducted by G&T. The main focus of this work was development of a flowsheet for production of a bulk concentrate containing all potential revenue metals at high recovery with the constraints of meeting minimum acceptable Ni + Cu contents for sale to a smelter and rejection of sufficient magnesium silicate minerals (principally talc) to avoid excessive penalties for MgO content.

Other components of the program included:

- Gravity concentration testwork targeted on enhancement of gold recovery
- Magnetic concentration scoping tests to investigate potential for enhancement of pyrrhotite recovery and/or magnetite rejection
- Variability testing (flotation only), on samples reflecting the range of ore grades within the mine plan.

A wide variety of conceptual flowsheets were tested, with investigation of the effects of various collector and depressant reagents, air vs. inert gas for flotation and talc pre-flotation/rejection.

Principal conclusions of the study include:

- Concentrates containing saleable metal grades were recovered using conventional flotation methodology
- Copper (chalcopyrite) is readily floatable
- PGM recovery was generally in proportion to recovery of sulphide
- The best overall recoveries, particularly of PGM, were achieved using inert gas flotation of pyrite and pyrrhotite followed by activation/air flotation of chalcopyrite and residual sulphides.

- Magnetic concentration did not result in either useful upgrading of sulphide recovery or rejection of gangue
- Knelson gravity concentration test results indicate significant recovery (52%) of gold to a relatively high-grade concentrate (19 g/t Au) at a low mass pull (0.1%).

For preliminary design, the main test results considered were tests #22 and #23, which provided the highest overall recoveries to a single concentrate. Both tests were run through a five-stage locked cycle. Combined results of the fourth and fifth cycles were used for design purposes.

Major features of these tests included:

- Grinding with de-aerated water to P80=86 µm
- Talc pre-flotation with methyl isobutyl carbinol (MIBC) frother/inert gas
- Pyrite/pyrrhotite flotation using copper sulphate, xanthate, “W34” frother, PE26 (guar gum-carboxymethyl cellulose blend) talc depressant and inert gas
- Copper conditioning/flotation with additional reagents and air
- Cleaner flotation of the combined rougher concentrates in air with additional reagents.

Combined results of the fourth and fifth cycles of Test #23 were used for process design.

Gravity concentration results on flotation feed indicated the feasibility of recovering about 30% of the gold to a low mass pull (0.04% for test No 44) at a high enough gold grade (97.5 g/t Au) to be blended directly with the flotation concentrate.

16.1.4 Chemical Processing of Concentrate

An initial four-test program of pressure oxidation of concentrate under proprietary Platsol™ conditions was conducted on a low-grade concentrate and reported by SGS.

A sample of flotation concentrate from the Thunder Bay North project was tested in a 2 L Parr titanium batch autoclave, under standard Platsol™ pressure oxidation operating conditions. The concentrate was oxidized for two hours at a temperature of 225°C, under an oxygen partial pressure of 100 psi and in the presence of 10 g/L chloride ions in solution.

Greater than 90% of the platinum and about 90% of the palladium in the concentrate were solubilized, along with >90% of the nickel and cobalt. Four tests were carried out in which the effects of fine grinding the concentrate, increasing the acid concentration in solution, and lowering the chloride concentration to 5 g/l were examined.

None of these changes had a significant effect on metal recoveries, except for lowering the chloride strength, which had an adverse effect on platinum recovery.

Subsequently, an additional test was performed on relatively high-sulphide concentrate from the G&T Test #23. Results indicated the technical feasibility of high leach efficiencies for all potential revenue metals under these conditions.

16.1.5 Recovery of Revenue Metals from Platsol™ Solution

Several methods were considered at the conceptual level for recovery of revenue metals from the Platsol™ pregnant leach solution (PLS) within the constraint of keeping the hydrometallurgical operation simple and economical but providing upgraded products which would improve Project revenue due to reduced impact of smelter deductions.

The selected conceptual cementation flowsheet described in the following section is based on extrapolations from published information considered to be applicable and reliable. It is noted, however, that no testwork has been done on Platsol™ PLS solution from Thunder Bay North concentrates to confirm performance of the options considered.

16.1.6 PGM and Copper Recovery by Cementation with Nickel (Cobalt) EMEW® Electrowinning

The Platsol™ pregnant leach solution is treated with copper powder (an internal recycle stream) to reduce solution Eh by reduction of ferric iron, PGM and part (approximately 5%) of the copper. The resulting dilute suspension of PGM and cuprous chloride is thickened and filtered to produce a cake containing essentially all of the PGM (about 10 kg/day) with about 200 kg/day of copper chloride. The thickened pulp is contacted with fresh Platsol™ PLS to dissolve most of the CuCl. The precipitate leach solution recycles to the PGM precipitation.

The PGM–AgCl–CuCl residue from the PLS leach (15–20 kg/day net product) is heated in a strong chloride solution (salt or ferrous chloride from copper precipitation, see below) to dissolve silver and copper. Filtration produces a PGM + gold cake which is vacuum-dried, de-agglomerated and packed for shipment to a refinery.

Filtrate is cooled to precipitate an AgCl–CuCl precipitate, >65% silver, for sale to a silver refinery or chemical producer.

Copper remaining in the Platsol™ solution after PGM precipitation is precipitated quantitatively as CuCl by reduction on copper powder. CuCl is thickened and further reacted with scrap iron to produce copper powder ("cement" copper). Copper powder equivalent to net production, about 7.8 t/d, is filtered, washed and briquetted for sale. Approximately 8 t/d of copper powder is recycled to reduce ferric, precipitate PGM, and CuCl. Net ferrous chloride product is recycled to the Platsol™ feed, partly replacing salt as a source of chloride ion.

Precipitation of copper as copper chloride from an acid sulphate–chloride leach solution using copper powder and cementation of copper from the precipitate slurried in ferrous chloride brine was commercially practiced for many years at Chuquicamata (McArthur and Leaphart, 1961).

Essentially copper-free solution passes to limestone neutralization and iron oxidation/jarosite precipitation; iron precipitate and gypsum are filtered and pass to tailing. Nickel (and cobalt) is then precipitated as hydroxides/basic sulphates, along with gypsum, by lime adjustment to pH 8. The gypsum-nickel hydroxide precipitate is thickened, filtered and repulped with a nickel sulphate pH 6 electrolyte and passed as a slurry through EMEW® cells to plate nickel-cobalt alloy which is stripped and sold. For revenue computation, cobalt is valued at the price of nickel and marketing is limited to manufacturers of non-nuclear grades of stainless steel. The precedent for this is cobalt recovery from leach solutions in the Congo (Bouchat and Saquet, 1960).

Acid generated by plating of nickel is consumed by hydroxide so the pH and Ni(Co) contents of the circulating solution remain constant. Gypsum, with any residual nickel hydroxide, is removed from the circulating electrolyte by filtration and recycled to the jarosite precipitation. The final step in solution treatment is pH adjustment with lime to precipitate magnesium as its hydroxide and the associated sulphate as gypsum to prevent discharge of an excessive level of soluble magnesium sulphate.

16.2 Conceptual Process Design

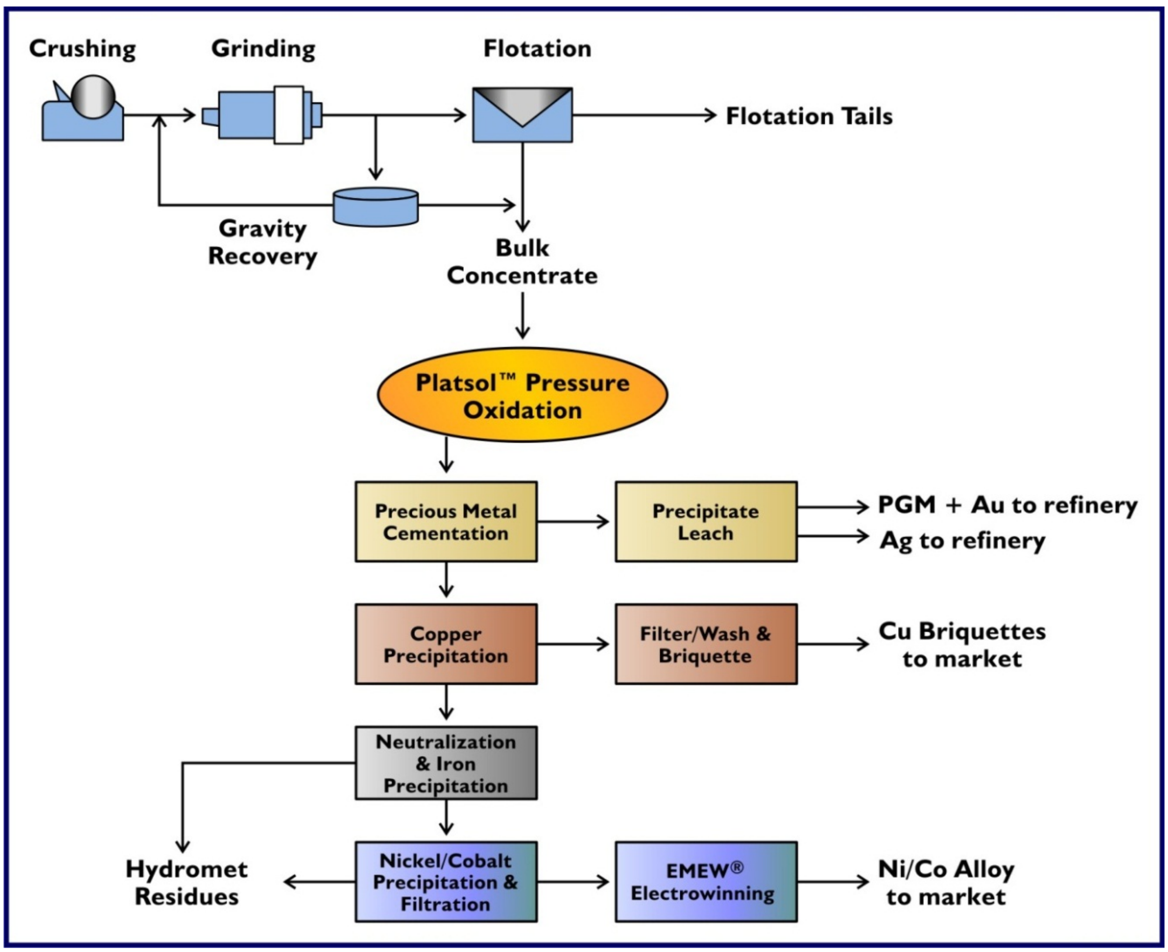
The three-stage process selected as the preferred process route is as follows:

- Crushing, grinding and flotation to extract the sulphides from the ore to produce an initial bulk concentrate. A gravity circuit would extract a significant proportion of the gold, which is output to the bulk concentrate.

- The bulk concentrate is then treated by Platsol™ pressure oxidation to produce a pregnant leach solution (PLS), which contains the dissolved metals.
- The PLS is then treated via relatively simple and commercial process routes (reduction with metal (cementation) to produce both precious metals bullion and copper, followed by electrowinning of nickel and cobalt).

The overall conceptual flowsheet is included as Figure 16-1.

Figure 16-1: Conceptual Process Flowsheet



Four high value products will be made and either sold to metal refineries or direct to end-users:

- A high-grade precious metals (PGM and gold) bullion product to a PGM refinery
- A high-grade silver product to a silver refinery

- Copper briquettes to market, and
- A nickel-cobalt alloy to market.

16.3 Projected Process Recoveries

Recoveries of revenue metals for the copper–PGM bulk concentrate flotation stage are based on results of the G&T locked cycle Test 23, except for gold for which additional recovery (flotation + gravity recovery to concentrate, 80.8%) has been allowed due to inclusion of a centrifugal concentrator. Rhodium was not assayed for by G&T. For modeling purposes, rhodium flotation recovery has been assumed to be the average of the Pt and Pd recoveries. Results of a series of "6PGE" analyses by Ultra Trace indicate a rhodium flotation recovery of 83% from G&T Test 23 which agrees reasonably well with the Pt+Pd average value of 79.3%. Recoveries of metals to final products for sale to smelters are based on reported Platsol™ extractions from the G&T Test #23 product minus solution loss allowances of 1% (for Cu, Ag, PGM, and Au) and 2% (for Ni + Co) for separations after the Platsol™ leach (Table 16-1).

16.4 Projected Process Criteria

Unit operations for processing the mineralized material at Thunder Bay North are presented in Table 16-2, Table 16-3 and Table 16-4.

16.5 Reagents and Utilities

Reagent requirements indicated by the test program for the concentrator included MIBC frother, PE26 depressant, copper sulphate, sodium isopropyl xanthate; W34 frother (Huntsman), flocculant and nitrogen. Other concentrator consumables are wearing steel for the crushers, balls and liners for the mill, miscellaneous lubricants, and laboratory consumables. Power requirements for the concentrator are dominated by the ball mill. For the Platsol™ facility, consumables are oxygen, salt (NaCl) and limestone. Major power consumers are the VPSA plant, oxygen compressor and autoclave agitator drives. The principal chemical consumables for the copper cementation Ni (Co) EMEW® process are iron scrap, limestone, lime, and flocculant.

16.6 Tailings Management

Tailings will be transported from the plant site through a surface pipeline to the tailings management facility (TMF). The tailings will be pumped as slurry at an assumed 55% solids content by weight. Tailings will be deposited mainly by end-discharge with occasional spigotting to form smooth tailings beaches.

The TMF will facilitate tailings slurry water and runoff with water reclaimed for mill operation. Tailings slurry will be discharged from the perimeters of the impoundment and a tailings pond will be formed against naturally high ground. This arrangement will reduce the seepage losses through the dam foundation. Tailings water will be continuously reclaimed and returned back to the plant for use in the mill operation.

Table 16-1: Projected Recoveries

Metal	Metal Recovery (%)				Payable Metal	
	Flotation	Platsol™	Refining	Overall Recovery	Indicated	Inferred
Platinum	81	93	98	74	212.7 koz	1.2 koz
Palladium	78	97	98	74	200.4 koz	1.2 koz
Rhodium	79	95	98	74	8.7 koz	0.1 koz
Gold	81	95	97	75	14.0 koz	0.1 koz
Silver	65	84	85	46	197.8 koz	1.3 koz
Copper	87	98	100	85	40.3 Mlb	0.2 Mlb
Nickel	45	98	100	44	15.7 Mlb	0.1 Mlb
Cobalt	28	98	100	27	0.8 Mlb	0.0 Mlb

Table 16-2: Selected Process Unit Operations

Unit Operation	Selection Criteria
3-Stage Crushing	Energy efficiency vs. primary crushing - SAG milling
Ball Mill Grinding	Energy efficiency at target grind
Knelson Concentrator	Maximize gold recovery
Talc Preflotation	Required to achieve target revenue metal grades
Inert Gas Pyrite-Pyrrhotite Flotation	Maximize revenue metal recovery; first iteration
Platsol™ Pressure Oxidation	Improve payment terms for copper and PGM
Cementation Option	Optimize cost vs. revenue

Table 16-3: Process Design Criteria

Item	Sizing	Selection/Source
Mineralized material throughput	1,000,000 tonnes/year	Client
Primary Crushing	Jaw crusher	AMEC
	70% availability	AMEC
	Metso Nordberg C145, 300 HP	Vendor
Secondary Crushing	HP300 Standard	Vendor
Tertiary Crushing	HP300 Shorthead	Vendor
Screen	Double deck, 1.8 x 6.1 m (D1 = 55 mm, D2 = 10 mm)	AMEC
Fine ore bin	8h capacity	AMEC
Grinding	Ball Mill	AMEC
	16'x25', 4350 HP	Testwork
Gravity Concentrator	Knelson	Client
	KC-XD30VG	Vendor
Flotation	Wemco cells	AMEC
	Retention times	Testwork
	Design factor = 3	AMEC
Thickening	10 t/d/m^2	AMEC
Platsol™ Feed	138 t/d at 29%S	Testwork
Availability	90%	AMEC
Conditions	225C, 2h RT, 400 psi (95 O_2) 10 g/L NaCl	Testwork
Residue separation	Thickener	AMEC
	Belt filter, 0.1 t/h/m^2	AMEC

Note: The design criteria were developed using a process plant throughput of 1.0 Mt of mineralised material a year. To develop the capital costs for the concentrator for the 1.5 Mt/a throughput option, which forms the base case of this PA, the capital costs shown in the 1.0 Mt/a scenario were factored to reflect the increased cost of the larger/additional equipment required for the higher throughput.

Table 16-4: Cementation Process Design Criteria

Cu–PGM	Cu powder reduction	AMEC
Reduction	2h RT, 75C	
Separation	Thickener	
Cu–PGM	2h RT, ORP control	AMEC
Precipitate leach	Thickener	
Silver Separation	NaCl leach, 95C	AMEC
	Press filter (PGM+Au)	
	Cool filtrate, filter AgCl	
Bulk CuCl	Copper powder, 2h RT	AMEC
Precipitation	Thickener, filter	
Cu Cementation	Hot FeCl2 brine, 1h RT	AMEC
	Scrap iron	
	Thickener, filter, wash	
Cu Product	Briquetted washed Cu powder	AMEC
Iron/gypsum	Limestone/air	AMEC
Separation	Jarosite: 4h RT at T>95C	
	Thickener, press filter	
Ni–Co Precipitation	Lime, pH 8, 75C, 1h RT	AMEC
Separation	Press filter	
Ni(Co)EW	EMEW® slurry, pH 6	AMEC
Waste Solution Treatment	Lime to pH 9.5	AMEC

A rock-fill dam with low permeability till core augmenting the natural storage potential of the topography was considered the most reasonable base case storage concept deduced from the known engineering geology for the site area. Although a tailings basin which does not affect fish habitat was desired; given the volume of tailings and the Project location such a site was not identified.

In the closure configuration, the TMF will become a tailings ‘pile’ with no ponded water. The tailings beach will be covered with 0.15 m of soil and vegetated, and a permanent overflow spillway will be constructed to safely convey the probable maximum flood.

Approximately 9.5 Mt of tailings may be produced during the seven-year life of the mine. The TMF is currently designed for a total storage capacity of 6.6 Mm^3 (9.1 Mt) with potential for additional raises and/or expansion to accommodate additional capacity as required. If no further mineralization is developed to justify additional raise(s) of the confining structures, a combination of central spigotting and grading could be used in the final year to develop a gently-sloped final tailing surface to facilitate reclamation, thereby accommodating the additional material. Tailings dam design capacities should be reviewed during the next study phase.

16.7 Comment on Section 16

In the opinion of the QPs, the metallurgical test work conducted to date supports the declaration of Mineral Resources based on the following:

- The metallurgical testwork completed on the Project has been appropriate to establish the likely processing route
- Tests were performed on samples that were representative of the mineralization
- Recovery factors were tailored to the various elements.

AMEC notes that the Platsol™ technology has been tested extensively at pilot-scale but has not yet been commercially applied.

During the period of active mineral dressing testwork in the PA study, the focus was on production of a concentrate meeting smelter requirements (metal grades, MgO content) and achieving acceptable pay metal recoveries. The identification of Platsol™ processing as the optimum concentrate treatment provided a number of opportunities to improve recoveries outside the constraint of smelter acceptability:

- In particular, the availability of by-product acid has the potential to simplify and enhance flotation since under acidic conditions pyrite and pyrrhotite are typically more readily activated by copper sulphate for flotation by conventional collectors. This may allow simplification of flotation and increased recoveries of pay metals associated with the iron sulphide minerals. To the extent that iron sulphides are better activated/collected, flotation kinetics will improve and lessen the dependence of the process on expensive talc depressant
- Flotation under acid conditions would impact negatively on capital costs, but it is anticipated that this would be more than compensated by a combination of improved recovery and reduced talc depressant costs
- Sufficient testwork on high-pressure-grinding-roll (HPGR) comminution technology should be undertaken to determine its potential benefits in terms of both cost efficient comminution and in generating better liberation for subsequent flotation recovery
- A significant testwork program will be required to confirm and optimize the conditions for the Platsol™ process, based on re-optimized concentrate quality.
- A significant testwork program will be required to confirm and optimize the conditions for the metal recovery operations from Platsol™ leach solutions.

17.0 MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES

The mineral resource estimate was prepared by Peter Oshust, MAusIMM, Tomasz Postolski, P. Eng. and Christo Marais, AMEC employees, under the supervision of David Thomas, P.Geo., M.AusIMM., also an AMEC employee. Mr Thomas is the Qualified Person for the estimate.

17.1 Database

The current resource estimate is supported by 528 core holes. The database cut-off date is May 31, 2010.

17.2 Block Models

Two block models were created: one for an area considered amenable for open pit mining and one for an area to be considered for exploitation from underground. The block models are regular block models without sub-blocks or percent models. The models overlap, allowing for flexibility when designing the position of the interface between the planned underground and planned open pit operations.

The dimensions of the open pit and underground block models are provided in Table 17-1, and illustrated in Figure 17-1.

The underground block model block dimensions were chosen to achieve high geological resolution, for suitability to the selective open pit and underground mining methods being considered, and for grade composite spacing. The long axis of the block dimension of 10 m was selected as appropriate for the nominal section spacing of 50 m in the Beaver Lake area.

17.3 Wire-frame Modelling

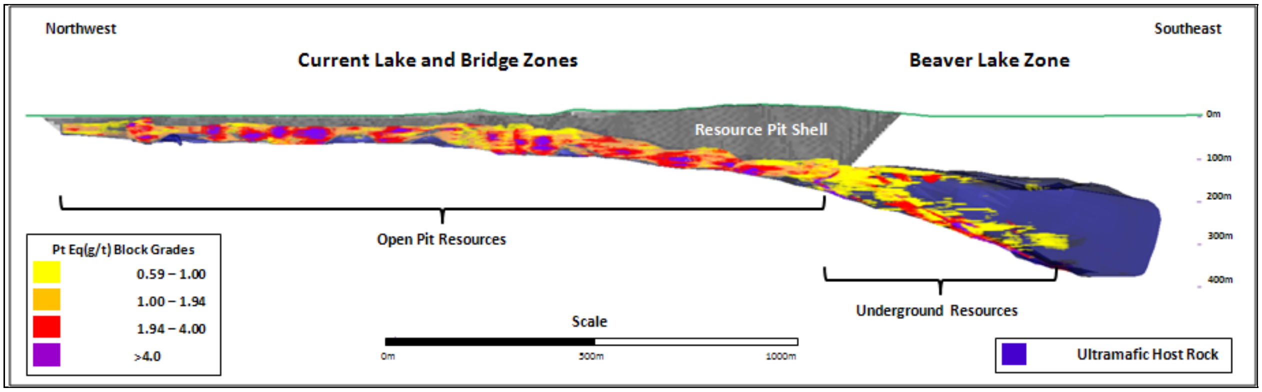
Wire-frame models representing topographical, geological and grade shell boundaries were generated in commercially-available Gemcom GEMS and MineSight software from available drill hole data and digitized interpretations provided by Magma Metals staff.

There are 49 vertical sections in the Current Lake Zone, 12 in the Bridge Zone and 17 in the Beaver Lake Zone. The vertical drill sections are generally oriented perpendicular to the ultramafic intrusion. Three areas of the Current Lake Zone were drilled with fans of angled holes from one location to resolve complex geological interpretations.

Table 17-1: Thunder Bay North Project Mineral Resource Estimate Block Model Dimensions

Model	Origin			Block Size (m)			Count		
	X	Y	Z	X	Y	Z	Columns	Rows	Levels
Open Pit	356,800	5,402,100	560	5	5	2.5	340	400	184
Underground	357,500	5,402,000	560	10	5	2.5	120	160	188

Figure 17-1: Long Section Showing Resource Model Areas



The envelope of the ultramafic intrusion provides the main geological boundary as well as the zero cut-off boundaries for the low-grade shell used for grade estimation. The purpose of the high-grade-shell model (high-grade shell) is to provide a hard boundary to constrain the grade estimate to mitigate smoothing during estimation. The topographical and wall rock geological boundaries are used for resource modelling and mine planning.

17.3.1 Geology Model

The mineralized ultramafic chonolith in the Current Lake Zone was modelled using two sets of polygons in GEMS software: the vertical section polygons interpreted by Magma and a second set of polygons created by AMEC. AMEC interpreted the second set of polygons on plan-view slices spaced 10 m apart through the Current Lake Zone to constrain the model of the intrusion in the plan-view dimension.

The ultramafic intrusion in the Bridge and Beaver Lake Zones was modelled in MineSight software from the vertical section polygons provided by Magma combined with several polygons interpreted by AMEC. Wire-frame surfaces were created between each adjacent polygon and then merged into a single, closed wire-frame. The intrusive complex is open to the south and east directions in the Beaver Lake

Zone. The surface trace of the geophysical magnetic anomaly provided the limits to constrain the model in the south. The model was not extended past the easternmost vertical section at 358,700 E.

The sub-vertical boundary between the non-mineralized metamorphosed granitic and sedimentary country rocks was modelled as a wire-frame in GEMS from drill core boundary intersections. Where no data were available, the surface was projected in the plane of the boundary surface to the limits of the block models.

The non-mineralized Hybrid rocks and minor intrusive rocks were not wire-framed for the purposes of the 2010 resource model. Narrow intervals of mineralized granitic, meta-sedimentary and, Hybrid rocks in contact with the ultramafic host rocks were modelled as ultramafic rocks and grouped as mineralized ultramafic rocks.

17.3.2 Grade-shell Models

Five grade-shell models were developed, two for the open pit area, two for the underground area, and a massive sulphide model (Table 17-2). All fall within the area of the geological shape of the ultramafic body.

The high-grade shells within the mineralized ultramafic envelope were modelled as wireframes in MineSight from grade contours interpreted and digitized by Magma Metals staff. The shells were based on vertical section interpretation, and confined within set Pt grade criteria. The high grade shells are accurate to individual drill hole grade sample intervals.

However, the high grade shell is not considered to be an accurate geological boundary or iso-grade model, because there are some grade samples below cut-off in the high grade shells and some samples above cut-off in the low grade shells. The completed wireframes are true to Magma's interpretation and the drill hole intersections.

Typically, the underground low-grade shell was not used in isolation, but combined with the underground high-grade shell.

Where mineralization was projected to be mined using open pit methods, a grade of 0.25 g/t Pt was used for the high-grade shell boundary (refer to Table 17-2); this covered the mineralization at Current Lake and the Bridge Zone. Where underground mining methods were likely, a Pt grade of 0.95 g/t Pt was used to establish the high-grade-shell boundary (refer to Table 17-2). This covered part of the Bridge Zone and Beaver Lake.

Table 17-2: Grade Shell Constraints

Model	Model Name	Constraint/Boundary
Ultramafic geological envelope	Ultramafic	Corresponds to 0 g/t Pt
Low-grade envelope (area of probable open pit exploitation)	Low-grade open pit	0 g/t Pt to 0.25 g/t Pt
High-grade envelope (area of probable open pit exploitation)	High-grade open pit	>0.25 g/t Pt
Low-grade envelope (area of probable underground exploitation)	Low-grade underground	0 g/t Pt to 0.95 g/t Pt
High-grade envelope (area of probable underground exploitation)	High-grade underground	>0.95 g/t Pt
Massive sulphide	Massive sulphide	Typically combined sulphides >85%

There is an area of underground and open pit high-grade-shell overlap in the Bridge Zone of about 150 m, which was designed to accommodate conceptual mine planning. The open pit high-grade shell was modelled to the boundary of the Bridge Zone with the Beaver Lake Zone. The open pit high grade shell lateral limits, based on the early assumptions for the size of the open pit, are short of the L–G resource pit shell.

AMEC recommends that, for future resource estimates, the open pit high grade shell should be interpreted and modelled to 358100 E or farther, for the reason that the open pit grade threshold is more inclusive and may potentially result in additional open pit mineral resource volumes above cut-off.

A massive sulphide wire-frame was constructed to constrain those areas of mineralization. Massive sulphide shapes were interpreted by AMEC by digitizing and then wire-framing contours in two directions on sections and\or plan views in GEMS. Where available, the wire-frame dimensions were constrained by geophysical EM conductor anomaly “plates” provided by Magma Metals. Where massive sulphides were intersected in only one drill hole, the interpreted dimensions were approximately twice as long on-strike as across strike of the ultramafic host with boundaries half way to the adjacent drill holes on section. The shapes are tapered toward the boundary edges. In some cases, typically where the massive sulphides occur at the base of the ultramafic host intrusion, modelled depressions in the basal contact surface were used to limit the lateral extents of the massive sulphide shapes.

17.3.3 Topographic Surface

The topography surface was modelled as a wire-frame in GEMS. The LIDAR x, y, and z (NAD83 Zone 16) point data were combined with the core drill hole collar locations to provide a topographic surface. The bedrock surface was modelled in GEMS as a wire-frame from the bathymetry survey data beneath Current Lake provided by Magma

Metals, combined with drill core intercepts. Where no data were available, the overburden thickness was assumed to be 2 m.

17.3.4 Use of Wire-frames in Modelling

The geological wire-frame models were used to inform (flag) the rock type models in the open pit and underground block models. The wire-frame of the ultramafic host rock provided the boundary of the low-grade shell outside of which no grades were estimated. The low- and high-grade shells and massive sulphide shapes were used to constrain the interpolated grade estimates.

Hard boundaries were assumed between the low- and high-grade shells. However, the boundary between the high-grade shell and massive sulphide shapes was assumed to be a soft boundary.

The block model rock type models were assigned unique block model codes to ensure proper identification for estimation and reporting. The mineralized ultramafic host rock codes identify the blocks by grade shell and anisotropy zone.

17.4 Composites

The original drill core samples were composited to 1 m standard length for outlier analysis and grade capping studies. The 1 m composites were subsequently composited to 2 m for exploratory data analysis, continuity analysis (variography) and interpolation. The capped 2 m composites were used for grade interpolation for the low-grade shells for the open pit and underground estimates. The uncapped 2 m composites were used for the grade capping study and interpolation for the high-grade shells.

Compositing typically results in some composites having less than full lengths. AMEC elected to retain the short composites by back-stitching the composites with lengths less than 0.8 m to the preceding composites to create a small number of composites greater than 2.0 m. The expanded size of the optimized resource pit shell required combining some of the underground composites with the open pit composites for grade interpolation.

17.5 Exploratory Data Analysis

Descriptive statistics from original assays including histograms, cumulative distribution curves, contact plots and, swath plots were completed by AMEC. The assay database was analyzed globally and was also subdivided into two groups of data: one, representing the assays in the Current Lake and Bridge Zones believed most likely to be considered for open pit mining, and a second of data from the Bridge and Beaver Lake Zones believed likely to be mined from underground.

The global assay database contains 22,700 assays within the ultramafic host rock envelope. The database for the open pit area contains over 9,300 assays. The database for the underground area contains almost 15,200 assays. There is a spatial overlap between the two areas resulting in approximately 1,800 assays being considered in both groups.

The rocks of the ultramafic intrusive complex form a continuum of true ultramafic rocks (e.g. peridotite) to mafic rocks (e.g. olivine melagabbro). In practice, drill core loggers may not be able to make a distinction between the two rock groups on a macroscopic scale. Magma Metals is currently studying the geochemistry of the host rocks with the goal of devising an efficient method of accurately determining the mineralogical classification of the rocks. For the purposes of the 2010 Mineral Resource estimate, the ultramafic and mafic host rock phases were grouped into a single domain.

The contact plots verified that hard boundaries between the assay data within the low-grade shell and high-grade shell should be enforced for resource estimation. The low-grade-shell model is defined by the mineralized host rock envelope. The high-grade-shell model was defined by contouring the assay grades on vertical sections and wire-framing at 0.25 Pt g/t for the open pit resource and by contouring the assay grades on vertical sections and wire-framing at 0.95 Pt g/t for the underground.

17.5.1 Data Rotation

The irregular tube-like morphology of the ultramafic intrusive complex, especially the chonolith in the Current Lake and Bridge Zones, required data rotation through co-ordinate transformation (unfolding) of the grade composites into a model space for continuity analysis and the drill hole spacing study. The grade composites were subdivided according to the general trend of a section of the chonolith. The result was seven zones: six in the Current Lake and Bridge Zones and one in the Beaver Lake Zone. The spatial co-ordinates of the samples in each zone were rotated to a uniform direction in the model space for variography. The grade estimates were interpolated from the composite samples in normal space using the variogram models derived for each anisotropy zone.

17.6 Grade Caps (Outlier/Extreme Values)

AMEC conducted outlier studies on the composited grade data for nine grade elements: Ag, Au, Co, Cu, MgO, Ni, Pd, Pt, and S. Two groups of grade composites were reviewed for both the open pit and underground: 1 m composites within the low grade shells, and 2 m composites within the high-grade shells, combined with 2 m composites from near-massive to massive sulphides.

AMEC used a combination of capping within the low grade shells and outlier restriction within the high grade shells, inclusive of massive sulphides, to reduce the predicted amounts of metal indicated by the capping studies. High-grade outliers in the low-grade shell were capped to the limits defined in Table 17-3.

No additional special treatment or restrictions were accorded to the capped 2 m composites during interpolation in the low-grade shells. The high-grade outliers in the high-grade shell were not capped. A restricted interpolation search strategy was used to reduce the predicted metal indicated by the capping study targets. The high grade outliers and target metal to be removed in the high-grade shells (including massive sulphides) are provided in Table 17-4.

Outlier restriction for 2 m composites in the high grade shell plus near-massive to massive sulphides was implemented during grade interpolation by limiting the search distance to a specified maximum for composites with grades above a selected threshold. Beyond the maximum distance, the composites above the threshold are not used for grade interpolation. AMEC used a three-pass strategy for interpolation to mitigate smoothing; search ranges increase with each pass. The search restrictions for the open pit high grade interpolation varied with each pass, and were equidistant in each search direction (Table 17-4). The search restrictions for the high grade shell in the underground were constant for all three interpolation passes but varied with search direction (Table 17-5).

To verify the capping and restriction strategies, AMEC produced an un-restricted model to compare the effect of the outlier restrictions on the grade estimates for the high grade shells. The un-restricted model of the high grade shell reported at a zero cut-off shows decreases in the amount of contained metal that were similar to the targets determined through the capping studies.

17.7 Variography

Unit sill variograms (correlograms) were calculated and modelled for Pt, Pd, Cu, Ni and MgO. The variograms were calculated for the low- and high-grade shells in the area considered likely to be mined by open pit methods and for the low plus high grade shells in the area considered likely to be exploited using underground mining methods. All structures were modelled using spherical models.

Table 17-3: Grade Capping Levels and Metal Targets for 1 m Composites within the Low-grade Shells

	Open Pit High Grade Shell(>0.25 ppm Pt)				Underground Low Grade Shell (>0.95 ppm Pt)			
Grade Element	Capping Value (ppm)	Number of Capped Values	Percentage of Capped Values	Target Metal to Remove (%)	Capping Value (ppm)	Number of Capped Values	Percentage of Capped Values	Target Metal to Remove (%)
Ag	2.5	9	0.22%	-0.32%	7	5	0.11%	-6.00%
Au	0.1	3	0.07%	0.00%	0.25	2	0.92%	0.00%
Co	210	2	0.05%	-0.00%	200	6	1.15%	-0.12%
Cu	2,500	11	0.28%	-0.01%	10,000	4	0.10%	-0.51%
MgO	No Cap	No Cap			No cap	No Cap	-	-
Ni	2,200	5	0.12%	-0.80%	3,000	4	0.36%	-0.34%
Pd	1.1	4	0.10%	-1.77%	4	2	0.11%	-0.56%
Pt	1.2	3	0.07%	-0.00%	4	3	0.14%	-1.04%
S	4.5	2	0.05%	-0.00%	5	2	0.08%	-0.22%

Table 17-4: Grade Capping Levels and Metal Targets for 2 m Composites within the High-grade Shells

	Open Pit High Grade Shell(>0.25 ppm Pt)				Underground High Grade Shell (>0.95 ppm Pt)			
Grade Element	Capping Value (ppm)	Number of Capped Values	Percentage of Capped Values	Target Metal to Remove (%)	Capping Value (ppm)	Number of Capped Values	Percentage of Capped Values	Target Metal to Remove (%)
Ag	16	3	0.10%	-0.48%	18	5	0.92%	-6.08%
Au	0.8	3	0.10%	0.00%	0.9	5	0.92%	-7.52%
Co	550	2	0.07%	-0.11%	550	6	1.11%	-1.55%
Cu	22,000	8	0.28%	-0.95%	25,000	7	1.29%	-8.79%
MgO	No cap	0	0.00%	0	No cap	0	0.00%	0.00%
Ni	11,000	9	0.31%	-0.43%	15,000	5	0.92%	-3.14%
Pd	11	3	0.10%	-0.37%	13	6	1.11%	-6.91%
Pt	11	4	0.14%	-0.43%	13	6	1.11%	-7.35%
S	10	3	0.10%	-0.33%	13	6	1.11%	-5.03%

Table 17-5: High Grade Outlier Restrictions Applied

		Open Pit			Underground		
		Ranges (X, Y and Z)			Ranges (X, Y and Z)		
Grade Element	Threshold	Pass 1	Pass 2	Pass 3	Range X	Range Y	Range Z
Au	15	20	30	60	20	30	10
Ag	0.8	20	30	60	20	30	10
Co	500	20	30	60	20	30	10
Cu	16,000	20	30	60	20	30	10
MgO	—	—	—	—	—	—	—
Ni	12,000	20	30	60	20	30	10
Pd	10	20	30	60	10	10	10
Pt	10	20	30	60	10	10	10
S	10	20	30	60	20	30	10

Typical ranges for the high-grade shells indicated first-structure ranges of the order of 5–7 m for Cu, Pt, and Pd. The Ni ranges were longer, about 11 m, whereas MgO ranges longer again, about 15 m. Nugget effects were reasonably low.

In the low-grade shells, the first-structure ranges for Cu, Pt, and Pd were about 7–9 m. Nickel first structure ranges were about 11 m, and the MgO ranges were about 14 m. Nugget effects for the Pt and Pd variograms were much higher than in the high-grade shell (Pt 0.34 vs 0.13; Pd 0.33 vs 0.13).

The combined low-grade and high-grade shells in the areas expected to be mined using underground methods displayed first-order structure ranges 14–16 m for Cu, Pt, and Pd, 20 m for Ni, and 12 m for MgO. Nugget effects were low, on the same order as the low-grade shell.

17.8 Grade Estimation

Ordinary kriging (OK) and inverse distance weighting to the first power (IDW) were used for grade interpolation for the mineral resource estimate. Ordinary kriging was used as the estimator for Cu, MgO, Ni, Pd and Pt. Inverse distance weighting to the first power was used for Ag, Au, Co and S. A nearest-neighbour (NN) interpolated block model was used as a means of creating declustered statistics for block model estimation validation.

Hard boundaries were enforced between the low-grade shells and the high-grade shells both in the open pit and underground estimates. Grade composite data from one domain was not used to inform blocks in the other domain. No data beyond the ultramafic model envelope was used to inform the block grade estimate. A soft boundary was used between the high-grade shell and the massive sulphides in the underground. A soft boundary permits data from either domain within the specified search distance to estimate the block grade; effectively there is no boundary.

A three-pass estimation strategy with expanding search ellipses was employed. The minimum and maximum number of samples was adjusted for each pass. An octant search was used for the first two passes. The numbers of samples used and the octant restrictions are provided in Table 17-6. The interpolation plans for OK were refined using the results of preliminary change of support analyses.

Both the open pit and underground block model blocks were discretized on a pattern of 3 m x 3 m x 1 m.

The search orientations for the grade estimation for all seven anisotropy zones for the open pit high grade shell are isotropic. The low and high grade composites were combined in order to calculate stable robust variograms for the underground model.

Table 17-6: Interpolation Parameters

	First Pass	Second Pass	Third Pass
Pt, Pd, Ni, Cu, MgO			
Estimator	OK	OK	OK
Minimum number of composites	3	3	3
Maximum number of composites	12	12	12
Maximum composites per hole	2	2	2
Search restriction	Octant	Octant	None
Minimum number of octants	5	5	
Maximum number of composites per octant	2	2	
Au, Ag, Co, S			
Estimator	IDW	IDW	IDW
Minimum number of composites	3	3	3
Maximum number of composites	12	12	12
Maximum composites per hole	2	2	2
Search restriction	Octant	Octant	None
Minimum number of octants	5	5	
Maximum number of composites per octant	2	2	
Search ranges in x, y, and z, for Ag, Au, Co, Cu, MgO, Ni, Pd, Pt, S for open-pit high-grade shell (metres)	40, 40, 40	60, 60, 60	120, 120, 120
Search ranges in x, y, and z, for Ag, Au, Co, Cu, Ni, Pd, Pt, S for open-pit low-grade shell (metres)	60, 30, 15	90, 45, 22	120, 60, 30
Search ranges in x, y, and z, for MgO for open-pit low-grade shell (metres)	20, 60, 30	30, 90, 45	45, 120, 60
Search ranges in x, y, and z, for Ag, Au, Co, Cu, Ni, Pd, Pt, S for underground low-grade and high-grade shells combined (metres)	40, 40, 15	60, 60, 20	120, 120, 40
Search ranges in x, y, and z, for MgO for underground low-grade and high-grade shells combined (metres)	40, 30, 15	60, 50, 20	120, 90, 40

17.9 Regression Derivations

Nickel and Cobalt in Silicate Minerals

The PtEq formula considers Ni and Co as metal in sulphides. However, the Ni and Co assays are reported by the assay laboratory as total metal. Hence, using the laboratory values in the formula without adjustment has a risk of overestimating PtEq, possibly by a significant amount. A downward adjustment of the Ni and Co results was therefore made in order to better estimate the total Ni and Co as metal in sulphides.

The portion of the Ni and Co sequestered in silicate minerals was estimated by linear regression of MgO to total Ni and Co respectively. Barren core samples (<0.1 percent sulphide as determined from sulphur assays) from the Project were selected for the linear regression analysis. Nickel and cobalt were plotted against MgO and a linear-regression calculated to predict the amount of nickel and cobalt in silicate minerals, for a given MgO content. The estimated Ni and Co sequestered in silicates was then calculated using the linear regression formula and the MgO result for each sample, and subtracted from total Ni or total Co to derive estimated Ni and Co in sulphides.

The formula to derive estimated sulphide Ni (NiSx) is:

NiSx (in g/t) = Total Ni (in g/t) – (MgO% x 60.35 – 551.43)

The formula to derive estimated sulphide Co (CoSx) is:

CoSx (in g/t) = Total Ni (in g/t) – (MgO% x 4.45 – 9.25)

Rhodium

AMEC also reviewed the potential for deriving a regression equation to estimate rhodium content. Rhodium could be recovered as a saleable by-product. In addition to rhodium, iridium, osmium, and ruthenium form a suite known as the “minor PGEs”, as distinct from Pt and Pd, the “major PGEs”.

All PGEs are typically correlated; however, there is significantly less minor PGE data (1,030 assays) than major PGE data (29,089 Pt assays). AMEC based the final regressions on all of the minor PGE data excluding outliers because the geological model was not separated into individual ultramafic lithologies.

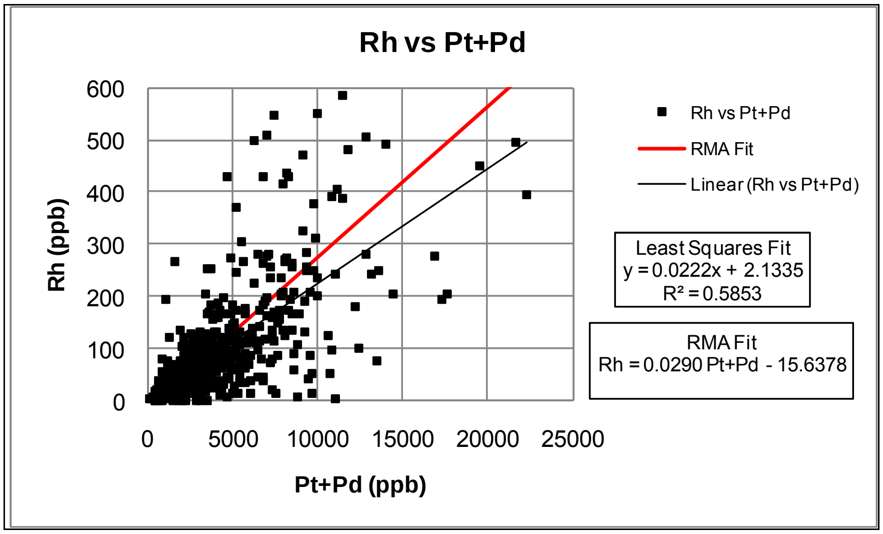
AMEC produced scatter plots for minor PGEs versus Pt + Pd including Rh, an example of which is shown in Figure 17-2.

The regression and least-squares fit is sufficient to provide a general estimate of the minor PGE data from Pt + Pd grades, but AMEC cautions that the regression should only be considered to be appropriate to provide order-of-magnitude results that cannot be relied upon for mine planning or detailed revenue estimates. The regression parameters for Rh are:

Rh pbb = 0.0290 Pt + Pd (in pbb) – 15.6378

AMEC concluded that the confidence in the Rh regression is low. It is likely that additional data will render the estimated regressions invalid. AMEC further concluded that, as the relative value of Rh is low (<6%), the limited confidence in the estimated values will not negatively impact on the overall confidence of the mineral resource estimate.

Figure 17-2: Rh versus Pt + Pd for all data.



AMEC recommends that additional work be undertaken on the minor PGEs, including:

- All PGEs, including the minor PGEs, should be assayed for each mineralized sample
- Lithologies Upd (peridotite) and Mgm (melanocratic gabbro) should be investigated with the goal of separating those units into additional geological units which would likely make estimation of minor PGE grades from Pt and Pd more reliable. Throughout the data multiple populations are indicated, and AMEC could not reliably separate those populations for estimation purposes.

17.10 Density

Specific gravity (SG, or density) was estimated by linear regression of the estimated Pt + Pd g/t grades in the open pit and underground block models. The open pit and underground data were analysed separately due to expected higher densities of the underground lithologies.

The linear regression formula for density in the open pit block model is:

$$Density = (0.0121 \times Pt + Pd\ (grade\ in\ g/t)) + 2.9087$$

The linear regression formula for density in the underground block model is:

$$Density = (0.0143 \times Pt + Pd \text{ (grade in g/t)}) + 2.8943$$

17.11 Model Validation

Model validation performed included verification of the SG estimate, model volumes, visual inspection of the OK and IDW grade estimations and regressions, review of global statistics, selectivity analyses, review of grade profiles using swath plots, and contact relationships using contact plots. No errors or biases were noted.

17.12 Drill Spacing Study

AMEC conducted a drill hole spacing study that would indicate what drill spacings would be sufficient to predict potential production with reasonable precision.

The study indicates drill hole spacing of 50 m x 10 m for Indicated Mineral Resources and 20 m x 10 m for Measured Mineral Resources in the open pit model. In the underground model the drill hole spacing as demonstrated by the study is 50 m x 20 m for Indicated Mineral Resources and 30 m x 10 m for Measured Mineral Resources.

AMEC treated the study results as a guide to inform mineral resource classification; while at the same time the proposed drill hole spacing should be easily amenable to the existing drill hole patterns. As a result AMEC suggests that in the underground model a 50 m x 20 m is a reasonable drill hole pattern to support upgrading mineralization from the Inferred category to the Indicated category.

The drill hole spacing study revealed that Pt has higher grade variability than Ni. Higher variability means higher risk, but a risk which can be mitigated with tighter drill spacing. For this reason, AMEC's recommendations for confidence classifications in Section 17.13 are based on the results of the Pt drill hole spacing study.

17.13 Mineral Resource Confidence Classification

Classification of mineral resource confidence categories took the following into account:

- The coefficients of variation of the base metal and PGE grade data are low.
- The modelled geometry of the mineralized host rocks is reasonably well-informed and is continuous.

- The average spacing of the vertical sections across the ultramafic chonolith in the Current Lake and Bridge Zone areas is approximately 50 m.

The underground preliminary mining shapes were clipped to the nearest matching economic open pit adjusted to eliminate individual and isolated blocks not likely to be mined due to separation distance.

In the Current Lake Zone and Bridge Zone within the area of the open pit resource model, AMEC considered the data acceptable to support an Indicated resource classification in the open pit model where the estimated blocks within the low-grade and high-grade shells were within 30 m of the nearest drill hole. The remainder of the blocks in the open pit model within the low-grade and high-grade shells were classified as Inferred.

In the Bridge Zone and Beaver Lake Zone areas of the underground resource model AMEC considered the data acceptable to support Indicated resource classification where the shapes of the modelled high-grade shell were continuous across two or more sections, and where the blocks were within 30 m of the nearest drill hole. The remainder of the blocks in the underground model within the high grade shell were classified as Inferred. Blocks in the underground model in the low-grade shell were not classified.

At the current drill spacing, AMEC considered that declaration of Measured mineral resources was not supported.

A small number (17) of angled core holes >100 m in length were used to define the underground high grade shell and were used for grade data to support the mineral resource estimate in blocks classified as Indicated. AMEC reviewed the core holes individually for survey consistency and corroboration with adjacent vertical holes and considers that the data are acceptable for resource classification as Indicated for the current level of study. AMEC nevertheless is of the opinion that the down-hole survey issues should be investigated and corrected prior to undertaking more advanced studies.

17.14 Mining and Mineral Processing Assumptions

17.14.1 Open Pit

The following input assumptions were established in January 2011, and used to calculate the marginal cut-off grades (COG) for resource modeling and preliminary economic modeling:

- The assumed throughput of the process plant is 4,109 metric t/d
- The open pit ore and waste mining cost is assumed to be C$1.78/t
- The underground mining method assumption is cut-and-fill
- The direct mining costs are assumed to be C$23.00/t and the indirect costs are assumed to be C$22.00/t for a combined total assumed underground mining cost of C$45.00/t
- The mineral processing and tailings management cost is C$10.13/t milled
- The Platsol™ and precipitation plant cost is $10.47/t milled
- The product transport cost is C$0.10/t milled.

The projected flotation plant and the projected Platsol™ and precipitation plant recoveries for the metals of interest are provided in Table 17-7, together with the projected smelter terms.

The assumed metal prices used for the marginal cut-off grades for resource modeling and preliminary economic modeling are provided in Table 17-8. Metal prices were supplied by Magma Metals, and are based upon consensus long-term price forecasts sourced by Magma Metals January 2011 from a number of reputable financial institutions.

17.14.2 Underground

Revenue grades were based on the assumed process and smelter recoveries presented in Table 17-9 and the metal prices indicated in Table 17-10.

17.15 Marginal Cut-off Grades

Resource model materials within the conceptual mining shapes are interrogated by the appropriate marginal cut-off. Marginal cut off grades have been calculated from the economic, technical and cost assumptions provided above, for the cases of platinum revenue only, to be applied to a platinum-equivalent calculated grade item.

A marginal cut-off defines a break even between revenue and cost, in the form:

Marginal Cut-off Grade = [Sum of Ore Based Costs ($/t milled)] / [Net Revenue ($/g sold)]

The marginal cut-off grade, based on Pt, for the open pit was derived as 0.59 g/t PtEq.

Table 17-7: Assumed Flotation, Platsol™ and Precipitation Plant Recoveries, and Smelter Terms Used in the PtEq Formula

	Flotation Recoveries	Platsol™ Recoveries	Smelter Terms
Metal	Recovery (%)	Recovery (%)	Payable (%)
Ag	65.2	84.2	85
Au	80.8	94.6	97
Co	28.4	97.6	100
Cu	87.2	98.6	100
Ni	44.7	97.6	100
Pd	77.6	97.1	98
Pt	80.9	93.3	98
Rh	79.3	95.2	98

Table 17-8: Consensus Metal Prices Used in the Cut-off Grade and PtEq Formulae.

Metal Prices		
Metal	Units	Price
Ag	US$/oz	15.74
Au	US$/oz	1,015.00
Co	US$/oz	7.71
Cu	US$/lb	2.20
Ni	US$/lb	7.71
Pd	US$/oz	512.00
Pt	US$/oz	1,595.00
Rh	US$/oz	3,479.00

Table 17-9: Assumed Process and Smelter Recoveries used in the Cut-off Grade and PtEq Formulae

Process Recovery		Smelter Recovery	
Metal	Recovery (%)	Metal	Recovery (%)
Ag	50	Ag	85
Au	50	Au	85
CoSx	90	Co	50
Cu	90	Cu	85
NiSx	90	Ni	90
Pd	75	Pd	85
Pt	75	Pt	85
Rh	75	Rh	85

Table 17-10: Assumed Metal Prices used in the Cut-off Grade and PtEq Formulae

	Metal Prices	
Metal	**Units**	**Price**
Ag	US$/oz	14.30
Au	US$/oz	875.00
Co	US$/oz	13.00
Cu	US$/lb	2.10
Ni	US$/lb	7.30
Pd	US$/oz	400.00
Pt	US$/oz	1,470.00
Rh	US$/oz	4,000.00

The derivation for the open pit marginal cut-off grade was as follows:

$$\text{Open Pit COG} = \frac{\text{Ore Process Costs + Conc. Transport + Platsol™ Treatment + G\&A}}{\text{Pt Price / FNX / g/oz x TR\% x (1 - Royalty\%)}}$$

$$= \frac{\text{C\$10.13 /t + C\$1.10 g/t + C\$10.47 /t + C\$2.67 /t}}{\text{US\$1595 /oz / 0.90 / 31.1035 x 74\% x (1 - 2\%)}}$$

$$= \text{0.59 g/t PtEq}$$

where COG = cut-off grade; FNX is the US$/C$ exchange rate; and TR% is total recovery (flotation, Platsol™ and Refining).

The open pit cut-off grade presented is the internal or mill cut-off grade. The internal cut-off grade is used to delineate ore and waste within defined pit limits, and does not include mining costs. However, mining costs were used in the generation of the optimized pit shell. When mining limits are established, mining costs are sunk costs, required to provide access to the material at the bottom of the pit. The mill (ore)/waste decision is effectively made at the pit rim, where the choice is whether to route the loaded truck to the mill or the waste dump. At this point, the costs of drilling, blasting, loading and hauling to the pit limit are sunk costs.

For the underground, the break-even cut-off grade was 1.94 g/t PtEq.

The derivation for the underground break-even cut-off grade was as follows:

$$\text{UG COG} = \frac{\text{UG Mining Cost + Process Cost + Conc. Transport + Smelter Treatment + G\&A}}{\text{Pt Price / FNX / g/oz x PR\% x SR\%}}$$

$$= \frac{\text{C\$45.00 /t + C\$10.00 /t + C\$2.30 g/t + C\$3.75 /t + C\$4.00 /t}}{\text{US\$1470 /oz / 0.90 / 31.1035 x 75\% x 85\%}}$$

= *1.94 g/t PtEq*

where COG is the cut-off grade, UG is underground; FNX is the US$/C$ exchange rate, PR% is process recovery and SR% is smelter recovery.

Royalty payments are only applicable to open pit mine production.

17.16 Platinum Equivalency

17.16.1 Open Pit

A platinum grade equivalent formula is used for conceptual mining shape generation, the application of cut-off grades within the conceptual mining shapes, and for reporting the Mineral Resource statement. The derivation of the platinum equivalency formula that is used to report the Mineral Resource statement is based on generally-accepted industry practices.

As platinum is the highest value metal analyzed, a platinum equivalent formula is used to derive the value from the secondary metals in terms of in-situ Pt and to add the contributions of the secondary metals to the Pt grade. It is important to note that the PtEq grade is an in-situ grade. To determine the recovered PtEq metal, both the process and smelter recoveries must be applied. The result is that the recovered dollar value of the PtEq will be equal to the recovered dollar value of the platinum plus the secondary metals added together.

The factors in the PtEq formula, which convert the secondary metal grade of interest into an in-situ PtEq value based on the ratios of the value of the secondary metal being converted to PtEq to the value of recovered the platinum to the recovered value of the secondary metal being converted to PtEq, are provided for the open pit in Table 7-11. The metal factors are based on the assumed process and smelter recoveries and the commodity price assumptions that were presented in Section 17.14.1.

Assumed metal values, mineral processing recoveries and smelter recoveries are all accounted for in the PtEq formula.

The PtEq formula is:

PtEq g/t = Pt g/t + Pd g/t x 0.3204 + Au g/t x 0.6379 + Ag g/t x 0.0062 + Cu g/t x 0.00011 + Total Ni g/t x 0.000195 + Total Co g/t x 0.000124 + Rh g/t x 2.1816.

Table 17-11: Secondary Metal Factors.

Metal Factors	
Metal	**Factor**
Ag	0.0062
Au	0.6379
Co	0.000124
Cu	0.00011
Ni	0.000195
Pd	0.3204
Rh	2.1816

The conversion factor shown in the formula for each metal represents the conversion from each metal to platinum on a recovered value basis.

The assumed metal prices, combined flotation and Platsol™-cementation process recoveries and assumed refinery payables used in the PtEq formula are as shown in Table 17-12.

An example calculation for the conversion factor from palladium to platinum is as follows:

$$\text{Pt\_Eq g/t of 1 g/t Pd} = \frac{\text{[Pd Price (\$/oz) / 31.1035 g/oz x Pd Process Recovery (\%) x Pd Refinery Payable (\%)]}}{\text{[Pt Price (\$/oz) / 31.1035 g/oz x Pt Process Recovery (\%) x Pt Refinery Payable (\%)]}}$$

$$= \text{((\$512 /oz / 31.1035 g/oz x 75.3\% x 98 \%) / (\$1595/oz / 31.1035 g/oz x 75.5\% x 98\%))}$$

$$= 0.3204$$

17.16.2 Underground

The factors in the PtEq formula, which convert the secondary metal grade of interest into an in-situ PtEq value based on the ratios of the value of the secondary metal being converted to PtEq to the value of recovered the platinum to the recovered value of the secondary metal being converted to PtEq, are provided in Table 17-13.

Assumed metal values, mineral processing recoveries and smelter recoveries are all accounted for in the PtEq formula.

The PtEq formula is:

PtEq g/t = Pt g/t + Pd g/t x 0.2721 + Au g/t x 0.3968 + Ag g/t x 0.0084 + Cu g/t x 0.000118 + Sulphide Ni g/t x 0.000433 + Sulphide Co g/t x 0.000428 + Rh g/t x 2.7211

Table 17-12: PtEq Formula Assumptions

Element	Metal Price Assumption	Combined Flotation and Platsol™-Cementation Process Recoveries	Assumed Refinery Payables
Pt	US$1,595/oz	76%	98%
Pd	US$512/oz	75%	98%
Au	US$1,015/oz	76%	97%
Ag	US$15.74/oz	55%	85%
Cu	US$2.20/lb	86%	100%
Ni	US$7.71/lb	44%	100%
Co	US$7.71/lb	28%	100%
Rh	US$3,479/oz	76%	98%

Table 17-13: Secondary Metal Factors.

Metal Factors	
Metal	**Factor**
Ag	0.0084
Au	0.3968
Co	0.000428
Cu	0.000118
Ni	0.000433
Pd	0.2721
Rh	2.7211

17.17 Assessment of Reasonable Prospects for Economic Extraction

The general approach taken by AMEC, during the process of constraining the mineral resources, was to maximise the available mineral resources. This was undertaken by allowing the pit optimization to run independent of considerations of potential underground extraction. The mineralization that was amenable to underground mining methods was then determined from blocks outside the optimized pit shell.

For the purposes of constraining the mineral resources to assess reasonable prospects for economic extraction, the following exchange rate assumptions were used:

C$1 = $US0.90 and conversely $US1.00 = C$1.11

Mining and process cost assumptions for the likely open pit extraction methods are summarized in Table 17-14.

Costs are based on benchmarking against existing underground operations in Ontario, and on AMEC's experience with such projects.

Table 17-14: Open Pit Mining and Processing Cost Assumptions

Item	Unit	Parameter
Open Pit		
Mining cost (mineralization)	C$/t	1.78
Mining cost (waste)	C$/t	1.78
Pit slope angle	degrees	-50
Topographic surface		Latest Lidar and bathymetric data
Underground		
Mining method assumption		Cut and fill or drift and fill with backfill
Direct mining costs (mineralization)	C$/t	23
Indirect mining costs (mineralization)	C$/t	22
Total underground mining costs	C$/t	45
General and administrative costs	C$/t milled	2.67
Process		
Mill throughput	t/d	4,109
Flotation Processing cost	C$/t milled	10.13
Platsol™-cementation cost	C$/t milled	10.47
Concentration transport cost	C$/t milled	1.10
Flotation recoveries		Refer to Table 17-7
Platsol™ recoveries		Refer to Table 17-7
Smelter terms		Refer to Table 17-7

17.17.1 Open Pit

Mineral Resources considered amenable to open pit mining methods were constrained within a Lerchs–Grossmann (L–G) pit shell that was based on the optimisation parameters listed in Table 7-14, the platinum metal prices and recoveries listed Section 17.14.1, and a PtEq marginal grade of 0.59 PtEq. The PtEq grades were used to determine block revenues. Internal dilution was accounted for during the grade interpolation process. External or contact dilution was not accounted for in the resource model. External dilution would be addressed in any future mine planning process. Mineralization that displayed geological and grade continuity had grades above the marginal cut-off of 0.59 g/t PtEq, and was contained within the L–G shell, was considered to have reasonable prospects of economic extraction.

17.17.2 Underground

The underground mining method is expected to be a selective mining method, and may consist of either a cut-and-fill or drift-and-fill method, with voids backfilled. The mineralization that is likely to be extracted by underground mining methods was assessed by AMEC to determine the continuity of the resource material above the economic cut-off within the boundaries of the mineralized envelope and by determining if in AMEC's experience it would be feasible to economically extract the resources now or in the foreseeable future. AMEC established the resource material above cut-off is sufficiently continuous to be likely to be mined at a profit.

Mineral resources that were considered amenable to underground mining methods were constrained within a preliminary underground mining shape based on a mining economic cut-off grade of 1.94 g/t PtEq. A 1.94 g/t PtEq grade iso-shell was created in Gemcom and was scrutinized for individual or isolated blocks which in AMEC’s opinion were not likely to have reasonable prospects of economic extraction. However, individual blocks immediately below the open pit resource shell were included in the resource as they are likely to be mined even from the open pit. The blocks not meeting the criterion were not reported in the mineral resource. Only the blocks above break-even cut-off are part of the iso-shell. The internal dilution was accounted for during the interpolation process. External or contact dilution was not accounted for in the resource model. External dilution would be addressed in any future mine planning process. In AMEC’s experience, dilution of 5–10% could be expected when a method such as selective cut-and-fill mining is employed.

Mineralization that displayed geological and grade continuity and was contained within the 1.94 g/t PtEq grade iso-shell was considered to have reasonable prospects of economic extraction.

17.18 Mineral Resource Statement

Mineralization within the Thunder Bay North Project at the Current Lake, Bridge Zone and Beaver Lake deposits that demonstrates grade and geological continuity, and is either constrained by L–G pit shells that were based on reasonable extraction assumptions, or constrained within underground mineable shapes based on a selective mining method assumption, is considered to be classified in accordance with the 2005 CIM Definition Standards for Mineral Resources and Mineral Reserves. Mineral Resources are also compliant with the 2004 edition of the Australasian Joint Ore Reserves Committee (JORC) Code.

Open pit Mineral Resources have an effective date of 11 January 2011. Underground Mineral Resources have an effective date of 31 May 2010. David Thomas, P.Geo, an AMEC employee, is the Qualified Person for the estimate.

Table 7-15 presents the Mineral Resources that can be mined using open pit methods; Table 7-16 presents the Mineral Resources that would be amenable to underground mining methods. AMEC cautions that Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

Table 17-15: Open Pit Mineral Resource Statement, Thunder Bay North Project, Effective Date 11 January 2011, David Thomas, P.Geo.

Category	Quantity Tonnage (t x 1,000)	Grade									Contained Metal								
		Pt (g/t)	Pd (g/t)	Rh (g/t)	Au (g/t)	Ag (g/t)	Cu (%)	Ni (%)	Co (g/t)	PtEq (g/t)	Pt (oz x 1,000)	Pd (oz x 1,000)	Rh (oz x 1,000)	Au (oz x 1,000)	Ag (oz x 1,000)	Cu (t x 1,000)	Ni (t x 1,000)	Co (t x 1,000)	PtEq (oz x 1,000)
Indicated	8,460	1.04	0.98	0.04	0.07	1.5	0.25	0.18	140	2.13	282	266	12	18	411	21	15	1	580
Inferred	53	0.96	0.89	0.04	0.07	1.6	0.22	0.18	142	2.00	2	2	—	—	3	—	—	—	3

Notes to accompany Open Pit Mineral Resource Table
1. The mineral resource categories under JORC Code (2004) are the same as the equivalent categories under CIM Definition Standards for Mineral Resources and Mineral Reserves (2010).
2. The portion of the Mineral Resource underlying Current Lake is assumed to be accessible and that necessary permission and permitting will be acquired.
3. Strip ratio (waste to ore) of 9:1.
4. The open pit Mineral Resource is reported at a cut-off grade of 0.59 g/t PtEq within a Lerchs-Grossman resource pit shell optimized on PtEq.
5. The contained metal figures shown are in situ.
6. No assurance can be given that the estimated quantities will be produced.
7. The platinum-equivalency formula is based on assumed metal prices and overall recoveries.
8. All figures have been rounded; summations within the tables may not agree due to rounding. Tonnages and contained metal values are rounded to the nearest 1,000 tonnes, grades are rounded to two decimal places;
9. Tonnage and grade measurements are in metric units. Contained ounces are reported as troy ounces

Table 17-16: Underground Mineral Resource Statement, Thunder Bay North Project, Effective Date 31 May 2010, David Thomas, P.Geo.

Category	Quantity Tonnage (t x 1,000)	Grade									Contained Metal								
		Pt (g/t)	Pd (g/t)	Rh (g/t)	Au (g/t)	Ag (g/t)	Cu (%)	Ni (%)	Co (g/t)	PtEq (g/t)	Pt (oz x 1,000)	Pd (oz x 1,000)	Rh (oz x 1,000)	Au (oz x 1,000)	Ag (oz x 1,000)	Cu (t x 1,000)	Ni (t x 1,000)	Co (t x 1,000)	PtEq (oz x 1,000)
Indicated	1,030	1.63	1.51	0.08	0.11	2.4	0.39	0.24	172	3.48	54	50	2	4	80	4	3	—	115
Inferred	212	1.40	1.29	0.06	0.09	1.9	0.34	0.23	158	3.00	10	9	—	1	13	1	—	—	20

Notes to accompany Underground Mineral Resource Table
1. Mineral resources are reported to commodity prices of US\$875/oz Au, US\$14.30/oz Ag, US\$13/lb Co, US\$2.10/lb Cu, US\$7.30/lb Ni, US\$400/oz Pd, US\$1,470/oz Pt and US\$4,000/oz Rh;
2. Mineral resources are defined within mineable underground shapes;
3. Underground mineral resources are reported to a PtEq value of 1.94 g/t;
4. Tonnages and contained metal values are rounded to the nearest 1,000 tonnes, grades are rounded to two decimal places;
5. Rounding as required by reporting guidelines may result in apparent summation differences between tonnes, grade and contained metal content;
6. Tonnage and grade measurements are in metric units. Ounces are reported as troy ounces

18.0 ADDITIONAL REQUIREMENTS FOR TECHNICAL REPORT ON DEVELOPMENT PROPERTIES AND PRODUCTION PROPERTIES

As the Project is not at a development or production stage, this section is not relevant to the Report.

19.0 OTHER RELEVANT DATA AND INFORMATION

19.1 Proposed Open Pit Mine Plan

Initially AMEC studied two mining scenarios, a stand-alone open pit and a hybrid case with a smaller open pit mine and underground operation, utilising a drift-and-fill mining method. As the study progressed and the economic parameters became better defined, it became apparent that the stand-alone open pit presented better economic results then the hybrid scenario. A thoughput trade-off study was performed, comparing economics for throughputs of 1.0 Mt/a, 1.25 Mt/a, and 1.5 Mt/a for the open pit-only scenario. The 1.5 Mt/a case appeared most attractive, and was scheduled in more detail for use in the financial model.

19.1.1 Throughput Analysis

The throughput analysis compared the financial returns of three different cases, 1.0 Mt/a, 1.25 Mt/a and 1.5 Mt/a. Capital and operating costs were prepared for each. Directional nested shells were generated, and selected shells were used as pushbacks for high level mine scheduling and financial analysis within Whittle®

Both Indicated and Inferred Mineral Resources were considered in the throughput analysis. AMEC performed the throughput analysis based on PtEq grade only. The PtEq formula is as follows:

PtEq g/t = Pt g/t + Pd g/t x 0.3204 + Au g/t x 0.6379 + Ag g/t x 0.0062 + Cu g/t x 0.00011 + Total Ni g/t x 0.000195 + Total Co g/t x 0.000124 + Rh g/t x 2.1816.

A directional mining approach was taken, due to the elongated nature of the Thunder Bay North deposit. Four pushbacks were planned for the 1 Mt/a and 1.25 Mt/a cases, whereas the 1.5 Mt/a case utilised three pushbacks. Due to the short mine life and need for two sets of equipment to support mine operation in both a selective and bulk manner, AMEC assumed contract mining would be the preferred mining alternative. Thus, there was no allowance for a mining capital cost in the scenarios.

19.1.2 Dilution Skin

The resource was modeled on a whole block basis with no percent attribute used. The internal dilution was accounted for during the kriging interpolation process. To satisfy the assumption of no mining loses, a significant dilution skin was applied based on the cut-off grade and the grade of the blocks adjoined to the block equal or above cut-off. The following dilution skin thicknesses were applied:

- 1.5 m dilution applied on Intrusive waste contacts on the same bench
- 0.5 m dilution applied on Bedrock waste contacts on the same bench
- 1.0 m dilution applied for rock waste contacts above or below the mineralization
- 0.3 m dilution applied for overburden above the mineralization.

Lateral dilution was reduced from 1.5 m to 0.5 m due to the anticipated visual mineralization/waste delineation guidance when barren bedrock is in contact with mineralization. When the lateral waste is intrusive material, the mineralization/waste delineation will be performed by assays only.

These dilution skins were applied by assigning a mineralization percentage and routing code to all waste blocks contacting a mineralized block above the cut-off grade (0.69 g/t PtEq for 1.0 Mt/a, 0.63 g/t PtEq for 1.25 Mt/a and 0.59 g/t PtEq for 1.5 Mt/a). The material routing code has three destinations:

- Code 1: non-contact waste material routed to the waste dump
- Code 2: contact waste, routed to the mill
- Code 3: material above cut-off routed to the mill.

Code 1 materials were given a mineralization percentage of zero. Code 3 materials were given a mineralization percentage of 100. Code 2 materials received a mineralization percentage greater than zero and less than or equal to 100, depending on the number and spatial location of the 'ore neighbour' blocks.

The effect of the dilution is a 17% increase in mill feed, and a 12% reduction in PtEq run-of-mine (ROM) grade for the 1.5 Mt/a case.

19.1.3 Geotechnical Assumptions used in Mining

The overall slope angles account for the likely future ramp configuration. All of the ramps in the Current Lake area will be placed on the east wall. An 18° overall slope angle was used in the overburden material.

The Thunder Bay North deposit displays very low sensitivity to the slope angles with respect to the contained amount of mineralization; however, the stripping ratio varies considerably with the change in the slope angles. The relatively shallow Current Lake area would not be particularly sensitive to pit slope changes; however, the high strip ratio Beaver Lake area would be more sensitive to slope changes.

19.1.4 Mine Plan

Phase volumetrics by bench were manually scheduled, using maximum descent rates of ten 2.5 m benches per period in selective mining areas. Selective and bulk zones were tracked to allow individual costing on an annual basis.

Most of the Current Lake deposit lies under Current Lake. Dewatering the lake must be performed before commencing mining. This is expected to take several months. At the bottom of the lake there are several metres of unconsolidated sediments. After dewatering, this material will be removed. This can be done best during the winter time when the material is frozen. The material will need to be stored in a confined location to prevent running during higher temperatures. After the material has drained and consolidated, it is assumed to be suitable as a reclamation cover.

Due to the relatively short life-of-mine, a contract mining scenario is recommended. Initial mining at the north end of Current Lake will require small equipment, which can mine selectively. This fleet would consist of typically two, but up to three 4 m^3 to 5 m^3 excavators, matched to 50 t to 60 t trucks. The initial pre-stripping of the later phases that stretch south to the Beaver Lake zone, will be performed with larger bulk mining equipment. This fleet would consist of typically one, but up to two ~18m^3 excavators working on 10 m benches, matched to ~145 t trucks.

Two distinct mining operating costs are used:

- A $1.63/t mined, which reflects bulk pre-stripping in areas where warranted by sufficient depth of barren waste
- A $2.10/t is used for selective mining in and near the mineralized material
- The mining will proceed from north to south in a directional manner. The north part of the deposit lies close to the surface and has relatively high grades and a small strip ratio. After the first pushback is finished, this area will be available for backfilling, to the approximate bottom of lake elevation. It is expected that approximately 25% of the waste rock generated during the life-of-mine could be stored in the mined-out areas. At the initial stage there will be a small waste rock stockpile established on the east side of the pit. After mining progresses to about two-thirds through the Current Lake zone, a second, much larger, waste rock pile will be established, west of the Bridge Zone.

The planned material movement schedule is included as Table 19-1.

Table 19-1: Material Movement Schedule

Year	Totals	-1	1	2	3	4	5	6	7
O/P Direct to Mill (kt)	9,918	—	1,131	1,500	1,500	1,500	1,500	1,500	1,287
PtEq (g/t)	1.87	—	1.66	1.91	1.80	2.01	1.79	1.81	2.12
Pt (g/t)	0.90	—	0.79	0.92	0.85	0.98	0.87	0.88	1.03
Pd (g/t)	0.85	—	0.75	0.86	0.81	0.93	0.82	0.83	0.96
Au (g/t)	0.06	—	0.05	0.06	0.06	0.06	0.06	0.06	0.07
Ag (g/t)	1.33	—	1.16	1.33	1.26	1.33	1.33	1.32	1.60
Cu (g/t)	2,147	—	1,835	2,147	2,100	2,248	2,099	2,104	2,466
Ni (g/t)	1,642	—	1,576	1,715	1,697	1,681	1,530	1,528	1,771
Co (g/t)	133	—	129	137	137	135	129	128	139
Rh (g/t)	0.04	—	0.03	0.04	0.03	0.04	0.03	0.03	0.04
O/P To Stockpiles (kt)	69	69	—	—	—	—	—	—	—
PtEq (g/t)	1.32	1.32	—	—	—	—	—	—	—
Pt (g/t)	0.59	0.59	—	—	—	—	—	—	—
Pd (g/t)	0.59	0.59	—	—	—	—	—	—	—
Au (g/t)	0.04	0.04	—	—	—				
Ag (g/t)	0.86	0.86	—	—	—				
Cu (g/t)	1,419.6	1,420	—	—	—				
Ni (g/t)	1,493.0	1,493	—	—	—				
Co (g/t)	124.2	124	-	-	-				
Rh (g/t)	0.02	0.02	—	—	—				
O/P Reclaimed from Stockpiles (kt)	69		69	—	—	—	—	—	—
PtEq (g/t)	1.32		1.32	—	—	—	—	—	—
Pt (g/t)	0.59		0.59	—	—	—	—	—	—
Pd (g/t)	0.59		0.59	—	—	—	—	—	—
Au (g/t)	0.04		0.04	—					
Ag (g/t)	0.86		0.86	—					
Cu (g/t)	1,420		1,420	—					
Ni (g/t)	1,493		1,493	—					
Co (g/t)	124		124.2	—					
Rh (g/t)	0.02		0.02	—					
Total Open Pit to Mill (kt)	9,987		1,200	1,500	1,500	1,500	1,500	1,500	1,287
PtEq (g/t)	1.87		1.64	1.91	1.80	2.01	1.79	1.81	2.12
Pt (g/t)	0.90		0.78	0.92	0.85	0.98	0.87	0.88	1.03
Pd (g/t)	0.85		0.74	0.86	0.81	0.93	0.82	0.83	0.96
Au (g/t)	0.06		0.05	0.06	0.06	0.06	0.06	0.06	0.07
Ag (g/t)	1.33		1.14	1.33	1.26	1.33	1.33	1.32	1.60
Cu (g/t)	2,142		1,811	2,147	2,100	2,248	2,099	2,104	2,466
Ni (g/t)	1,641		1,571	1,715	1,697	1,681	1,530	1,528	1,771
Co (g/t)	133		128	137	137	135	129	128	139
Rh (g/t)	0.04		0.03	0.04	0.03	0.04	0.03	0.03	0.04
Waste (kt)	83,231	2,490	25,712	29,174	15,266	7,306	2,442	443	398
Total Mined (kt)	93,218	2,559	26,843	30,674	16,766	8,806	3,942	1,943	1,685
Strip Ratio	8.33	36.09	22.73	19.45	10.18	4.87	1.63	0.30	0.31

19.2 Mining Personnel

The mining personnel will consist of an owner's operations supervision and technical services group which would typically have 10 people on site at any time. The contractor would have a peak of approximately 115 hourly operations and maintenance workers, plus five staff employees.

19.3 Waste Rock

The development of the proposed open pit will generate 83 Mt of excavated overburden and blasted waste rock that will require storage. A portion of that material, estimated at approximately 3 Mt, will be used for a dam, and for loading facilities.

The current study assumes 60% of waste rock will be potentially acid-generating (PAG) with the remaining waste rock and overburden assumed to be non-PAG. However, additional geochemical characterization will be required to confirm this assumption. Storage on-land and in the mined-out open pit have been considered for non-PAG and PAG material respectively.

19.4 Hydrology

Average surface water flows into the Current Lake open pit are estimated at 1,600 m^3/d ($\cong$ 18 l/s) with peak surface water inflows after storm events at least two orders of magnitude higher. These are based on Environment Canada data and preliminary plans to divert the upstream watershed of Current Lake.

Current Lake is surrounded by three watersheds that contribute a total of 12.49 km^2 of water to the lake. Water exits the lake through the Current Lake outlet channel located at the north end of the lake. Without diversion structures, water entering from the lake catchments will require continual pumping from the open pit to the Current Lake Outlet during the expected life-of-mine. An evaluation of pumping costs versus construction costs for dams and diversion channels indicated the latter were the preferred option, based on a combination of smaller footprint, and operating costs. To prevent water from entering the open pit mine planned for within Current Lake, the preferred option involves blocking off the Current Lake outlet and constructing a diversion system on the east side of Current Lake (which includes the construction of two small dams and two diversion channels).

The Current Lake outlet dam is referred to as a 'cofferdam' as it is a temporary structure that prevents water from entering the open pit during operations. The Northeast Inlet dam and East Inlet dam are referred to as 'diversion dams' since they do not play a role in retaining 'lake water' and instead help divert water from the East and Northeast watersheds away from the open pit.

19.5 Infrastructure

Infrastructure requirements to support the planned mining operation are discussed in Section 5.

19.6 Environment

Environmental considerations for the Project are discussed in Section 4.

19.7 Marketing

The primary revenue metals at Thunder Bay North are (in order of significance) platinum, nickel, palladium and copper. Platinum and palladium are platinum group metals valued for their high melting points and resistance to oxidation and high temperature corrosion. Both are used primarily for catalytic converters in the automotive industry, for jewellery, and for industrial applications such as dental alloys, fuel cells, and electrical components (Johnson Matthey, 2010).

Nickel has a high melting point, forms alloys readily and is resistant to corrosion. When combined with steel, even in small quantities, the durability, strength and corrosion resistance of the steel increases significantly. The production of stainless steel is the single largest consumer of nickel. This highly useful metal is also used in the production of many different metal alloys for specialised use (The Nickel Institute, 2010).

Copper is an excellent conductor of electricity, as such one of its main industrial usage is for the production of cable, wire and electrical products for both the electrical and building industries. The construction industry also accounts for copper's second largest usage in such areas as pipes for plumbing, heating and ventilating as well as building wire and sheet metal facings (London Metal Exchange, 2010).

Market research performed on behalf of Magma Metals has indicated that there is a market for a bulk concentrate produced by Thunder Bay North and the likely payable metals would be Pt, Pd, Rh, Au, Ag, Cu, Co, and Ni. Research has also indicated that all of the high value products resulting from Platsol™ pressure oxidation and downstream processing would be highly marketable. The Project economics are enhanced by further processing of the concentrate on site.

19.8 Taxation

The Project is subject to Federal and Provincial taxes. The Federal Corporate Income Tax rate, as of 2012, will be 15%. The Ontario Provincial Tax rate will be 10%, effective July 12, 2013. Ontario mining operations are also subject to a provincial mining tax, levied at a rate of 10% on taxable profit in excess of $500,000.

19.9 Capital Costs

Capital costs were derived from a variety of sources including but not limited to comparative analysis of other operations, derivation from first principles, equipment quotes and factoring from other costs contained within the PA study. The accuracy of the estimates contained within this study vary due to the different methods of derivation used to estimate the costs however, in general the capital costs are expected to be within a +40%/-10% range.

No capital costs were attributed to open pit mining as the assumption was made that all equipment will be supplied by a contractor.

Estimated costs for the construction of the coffer dam, diversion structures, and the access road based on the use of local materials for construction are C$3.7 M. Estimated costs for the construction of the tailings dam are $19.2 M.

The total capital cost for the concentrator required for the 1.5 Mt/a case is estimated at C$59.3 M. The total cost of the concentrator, Platsol™ and refining facility is estimated at C$160.1 M.

Infrastructure costs for the project include access roads (C$2.7 M), haul roads (C$2.1 M), site preparation and earthworks (C$0.5 M), site structures (C$3.1 M), site services (C$2.7 M), construction camps (C$2.0 M) and power supply (C$10.0 M). The total costs for site infrastructure and power supply including engineering, procurement, and contract management (EPCM) and contingency is estimated at C$32.5 M.

Other capital costs accounted for in the study included Owner's costs, including Owner's vehicles, of C$4.3 M, a provision for royalty buy-out of C$1.0 M and closure costs estimated at $17.2 M that will were projected to be incurred at the end of the mine life.

All of these costs include allocation for sustaining capital over the life of the Project.

A total of approximately C$31 M will be gained as salvage value at the end of the Project life including C$18.2 M from the Platsol™ process plant. Capital costs are summarized in Table 19-2.

Table 19-2: Life-of-Mine Capital Costs

Item	Cost Estimate
Pre-Production	C$175 million
Sustaining Capital	C$46 million
Closure Cost	C$17 million
Salvage Value	(C$31 million)
Total Capital	C$207 million

19.10 Operating Costs

Operating costs were derived from a variety of sources including but not limited to benchmarking analysis, derivation from first principles, and factoring from other costs contained within the PA study.

Open pit mine operating costs are C$1.78/t for mining of mineralization and waste rock. Stockpile rehandle costs of C$0.75/t were used. The total open pit mine operating costs for the Project are estimated at C$167 M over the life-of-mine.

Total processing, Platsol™, EMEW® and cementation costs for the 1.5 Mt/a base case amount to C$203 M and equate to a total of C$20.31/t milled.

The 1.5 Mt/a throughput base case assumes a G&A cost of $2.67/t over the life-of-mine. This results in a total G&A cost of C$26.6 M for the operating life of the mine in the base case analysis.

Other operating costs associated with this project include product transport and insurance costs of approximately C$0.09/t milled or approximately C$1 M, refining charges of approximately $6.5 M and royalty charges of approximately C$13 M.

Operating costs are summarized in Table 19-3.

Table 19-3: Life-of-Mine Operating Costs

Item	Cost Estimate
Open Pit Mining	C$1.78/t mined
	C$16.72/t milled
Site Processing	C$20.31/t milled
Transport, Refining & Royalty	C$2.03/t milled
Site General & Administration	C$2.67/t milled
Total Operating Costs	C$41.73/t milled

19.11 Financial Analysis

The following section is partly based on Inferred Mineral Resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as Mineral Reserves, and there is no certainty that the preliminary assessment based on these Mineral Resources will be realized.

The results of the economic analyses discussed in this section represent forward-looking information (cashflows, net present value, internal rate of return, production rate, and total metal produced) as defined under Canadian securities law. The results depend on inputs that are subject to a number of known and unknown risks, uncertainties and other factors that may cause actual results to differ materially from those presented here.

One factor identified from drill data available after the Mineral Resource estimate was prepared is that the drilling confirms the geological interpretation for the Project area, but indicates that there is more potentially more grade variability from drill hole to drill hole than is currently predicted within the geological model.

19.11.1 Basis of Analysis

The Project has been valued using a discounted cash flow (DCF) approach. Estimates have been prepared for all the individual elements of cash revenue and cash expenditures for ongoing operations. Cash flows are taken to occur at the end of each period. Capital cost estimates have been prepared for initial development and construction of the project, and ongoing operations (sustaining capital).

The resulting net annual cash flows are discounted back to the date of valuation end-of-year 2010 dollars, and totalled to determine NPVs at the selected discount rates. The IRR is calculated as the discount rate that yields a zero NPV. The payback period is calculated as the time needed to recover the initial capital spent.

No income or mining taxes were included in the model. All financial data are shown on a before-tax basis. The base case economic analysis is based on 100% equity financing. Detailed analysis of working capital requirements was not undertaken.

Model assumptions were based on:

- Diluted Indicated and Inferred Mineral Resources

- Open pit mining method with a process plant capacity of 1.5 Mt/a and a seven-year mine life; during the first year of production in 2014, the mine will achieve 80% of the full annual production of 1.5 Mt/a
- Metallurgical recoveries as shown in Table 19-4.

Table 19-4: Base Case Metallurgical Recoveries

Commodity	Flotation	Platsol™	Refinery
Gold	80.80%	94.64%	97.00%
Silver	65.20%	84.15%	85.00%
Copper	87.20%	97.61%	100.00%
Nickel	44.70%	97.61%	100.00%
Cobalt	28.40%	97.61%	100.00%
Platinum	80.90%	93.36%	98.00%
Palladium	77.60%	97.12%	98.00%
Rhodium	79.00%	95.24%	98.00%

- Precious metals, in a powder form, will be transported at a cost of C$15/kg to the refinery and the copper metal and nickel/cobalt concentrate a cost of C$10.92/t. The precious metal powder will be insured for C$200 per C$1 M value. The copper metal insurance has been calculated to C$0.002/t of mineralization milled and for the nickel/cobalt concentrate at C$0.022/t mineralization milled
- An exchange rate of US$0.90 to C$1.00
- Base case metal prices as shown in Table 19-5; the consensus price for Cu (US$2.30/lb) was adjusted down by US$0.10/lb to US$2.20/lb for the purposes of the financial model due to the Cu produced by the project being slightly less refined than Cu traded on major metal exchanges. The price for Co was set at the price of Ni as it was assumed that the metals would be sold as a Ni/Co metal alloy at the long term nickel price
- Total royalty payments to be $13.8 M including the $1 M 1% royalty buyout premium
- A total of C$17.2 M is allocated for decommissioning in the last year of production
- The total salvage value of all assets considered to be saleable at the end of the life-of-mine is estimated to be approximately C$31.3 M of which C$1 M is recovered from the construction camp in Year 1 of operation and the remainder at the end of the life of the Project.

19.11.2 Results of Base Case Financial Analysis

The pre-tax cumulative cash flow is C$164.4 M with an IRR of 12.8%. The cash flow analysis shows that the Project will generate a positive cash flow in all years except Year 1 on a pre-tax basis. The annual positive cash flow results in a payback period of approximately 4.6 years. At an 8% discount rate, the net present value (NPV) of the Project is C$40.75 M.

Table 19-5: Base Case Metal Prices

Commodity	Price
Gold Price (US$/oz)	1015.00
Silver Price (US$/oz)	15.74
Copper Price (US$/lb)	2.20
Nickel Price (US$/lb)	7.71
Cobalt Price (US$/lb)	7.71
Platinum Price (US$/oz)	1,595.00
Palladium Price (US$/oz)	512.00
Rhodium Price (US$/oz)	3,479.00

19.11.3 Alternative Case

An upside case was run using the spot metal prices as of 21 January 2011, as shown in Table 19-6. The exchange rate assumption for this case was C$:$US 0.98.

A summary of the results of the financial analysis for the Alternate Case is included as Table 19-7 in relation to the Base Case results.

19.11.4 Base Case Sensitivity Analysis

Sensitivity analysis was performed on the base case taking into account variations in the metal prices, operating cost, foreign exchange and mining cost. Analysis shows that the Thunder Bay North Project is most sensitive to changes in metal price and foreign exchange as these directly affect the revenue stream. The sensitivity analysis shows that the Project is also sensitive, but less so, to operating cost and capital expenditure (Figure 19-1).

Table 19-6: Alternative Case Metal Prices

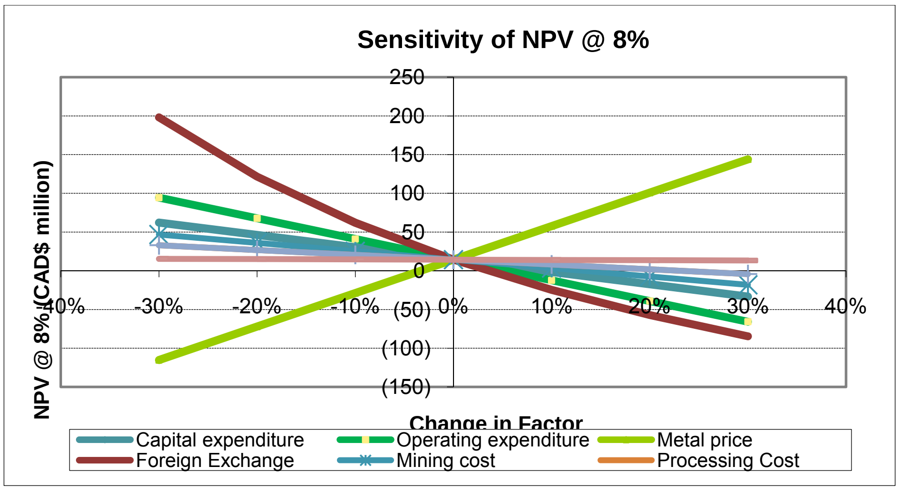
Commodity	Price
Gold Price (US$/oz)	1,342
Silver Price (US$/oz)	27.47
Copper Price (US$/lb)	4.22
Nickel Price (US$/lb)	11.93
Cobalt Price (US$/lb)	11.93
Platinum Price (US$/oz)	1,809
Palladium Price (US$/oz)	818
Rhodium Price (US$/oz)	2,400

Table 19-7: Alternate Case Financial Analysis

Parameter	Base Case: Using Long Term Metal Prices	Upside Case: Using Current Metal Prices January 21, 2011
Undiscounted pre-tax cash flow	C$164 million	C$360 million
IRR	13%	27%
NPV (8%)	C$41 million	C$164 million
NPV (5%)	C$77 million	C$222 million

Notes:
1. "Base Case: Long Term Metal Prices" are analysts' consensus forecasts of long term metal prices (average of 17 investment bank forecasts compiled in January 2011): Pt: US$1,595/oz, Pd: US$512/oz, Rh: US$3,479/oz, Au: US$1,015/oz, Ag: US$15.74/oz, Cu: US$2.30/lb, Ni: US$7.71/lb, Co: US$12.57/lb. Exchange Rate for this case: C$:$US 0.90.
2. "Upside Case: Current Metal Prices (at January 21, 2011)": Pt: US$1,809/oz, Pd: US$818/oz, Rh: US$2,400/oz, Au: US$1,342/oz, Ag: US$27.47/oz, Cu: US$4.22/lb, Ni: US$11.93/lb, Co: US$18.00/lb. Exchange Rate for this case: C$:$US 0.98.

Figure 19-1: Sensitivity Analysis



19.12 Risk and Opportunity Analysis

Key risks identified with the Project at this stage of study are:

- The Platsol™ technology has been tested extensively at pilot-scale but has not yet been commercially applied
- There is an element of technical risk in scaling up (a scale-up factor of three was used) a relatively complex flowsheet
- Testwork is required to identify the optimum conditions for PGM + Au cementation by copper powder and EMEW® recovery of nickel–cobalt alloy
- The concentrator portion of the operating cost is sensitive to the amount of depressant required to control talc. This presents both a risk (higher use of expensive reagents) and an opportunity by further testwork to develop a more cost-effective talc depression strategy
- The Project is very sensitive to metal prices. The Project produces a basket of metals, all independently subject to price changes.
- Project revenues are derived from the sale of the various metals in United States dollars, therefore the Project is sensitive to fluctuations in exchange rates between the United States and Canadian dollars
- Due to the complexity of the metallurgy, and the process required to extract the metals, the operating cost per tonne milled could change significantly. Additional work is suggested and this may result in alternative technologies to be utilised or better refinery/smelter terms may be negotiated. There is significant potential for reduction in flotation reagent costs (as well as better metal recoveries) associated with the change to use of Platsol™ technology. A significant test program is recommended to evaluate options and re-optimize the process
- By increasing the capital expenditure to produce a super-rich precious metal product, and thereby negating potentially unfavourable smelter terms, the Project becomes much more attractive. AMEC believes that more work in this regard is required to confirm these findings.

The most significant opportunity identified in this Project is continued development of the resource base of the project to delineate more feed material for the process plant through continued exploration and resource development. Other opportunities include:

- There is a potentially significant opportunity for cost reduction in comminution if further testwork can demonstrate satisfactory performance of HPGR technology on the Thunder Bay North mineralization

- Separate preparation of generic individual components for talc suppression has potential to reduce cost as well as optimizing the ratio of the components
- The adoption of Platsol™ processing opens up several potential options for development of a simpler flotation flowsheet and less expensive reagent suite. In particular, the availability of acid (by-product of Platsol™) would allow adjustment of the flotation pulp pH which may facilitate activation of the PGM-bearing iron sulphides in a less complex circuit. To the extent that sulphide flotation can be promoted, the requirement for large quantities of talc depressant may be mitigated
- In principle, selective oxidation of cobalt (pH 4–5, chlorate or chlorine oxidant) after the jarosite/gypsum removal stage could generate a cobalt (III) precipitate, perhaps with a Co:Ni ratio >1, which could be sold to, for example, a refinery such as Vale Inco's Port Colbourne cobalt refinery.

20.0 INTERPRETATION AND CONCLUSIONS

The following interpretations and conclusions are made based on the updated mineral resource estimate discussed in this Report.

- AMEC was provided with legal opinion that confirmed that the mineral tenure held by Magma Metals in the areas for which Mineral Resources are estimated is valid.
- The Current Lake group of claims are subject to a 3% net smelter royalty (NSR), one-third of which can be purchased by Magma Metals at any time for C$1 million. The royalty is payable for mineralization extracted using open pit mining methods.
- Mineral claims are located on Crown lands, and therefore surface rights are acquired as part of the claim process.
- Magma Metals has held preliminary discussions with First Nation groups in the region to discuss Project development.
- Permits obtained by the company to undertake exploration are sufficient to ensure that activities are conducted within the regulatory framework required by the Ontario Government. Additional permits will be required for Project development; preliminary discussions have been held with the relevant Federal and Provincial authorities.
- Environmental permits are required by various Canadian Federal, Provincial, and municipal agencies to support Project development. Environmental baseline studies commenced in 2007.
- At the effective date of this report, environmental liabilities are restricted to exploration sites and access roads constructed to service exploration programs.
- The existing and planned infrastructure, availability of staff, the existing power, water, and communications facilities, the methods whereby goods are transported to the mine, and any planned modifications or supporting studies are well-established, or the requirements to establish such, are well understood by Magma Metals, and can support the declaration of Mineral Resources.
- The geologic understanding of the deposit settings, lithologies, and structural and alteration controls on mineralization, and the mineralization style and setting are sufficient to support estimation of Mineral Resources.
- Completed exploration and development programs were appropriate to the mineralization style.
- Drilling to date has confirmed the geological interpretations for the deposit, but indicate that at a local scale, grade is more variable than predicted in the geological model.

- Exploration potential remains in the overall Project area, and there is an expectation that additional mineralization is likely to be identified with continued exploration and infill drilling.
- Sampling methods are acceptable, meet industry-standard practice, and are acceptable for Mineral Resource estimation purposes.
- The quality of the analytical data used in Mineral Resource estimation is reliable, and sample preparation, analysis, and security are generally performed in accordance with exploration best practices and industry standards.
- Metallurgical testwork completed on the Project has been appropriate to establish process routes that are applicable to the mineralization types and was performed on samples that were representative of the mineralization.
- The Platsol™ technology selected as the process route has been tested extensively at pilot-scale but has not yet been commercially applied.
- No testwork has been done on Platsol™ PLS solution from Thunder Bay North concentrates to confirm performance of the options considered.
- Mineral Resources and Mineral Reserves, which were estimated using core drill data, have been performed to industry best practices, and conform to the requirements of CIM Definition Standards (2010).
- The proposed open pit mining method is appropriate to the style of mineralization.
- Capital and operating costs have been factored from a 1 Mt/a operation to a 1.5 Mt/a operation; costs are considered acceptable for this level of study.
- No taxation considerations were included in the financial analysis.
- The financial analysis on the base case scenario indicates positive Project economics.
- An alternative case, using spot commodity prices at 21 January 2011 indicate a more robust Project, due to the increase in the commodity prices in the alternative case over the base case.
- The key Project risks are its sensitivity to commodity prices, and variations in the US$ to C$ exchange rate.
- The key Project opportunities are the potential to discover additional mineralization through drilling, and likely operating cost savings from modifications to the process route.

In the opinion of the QPs, the Project that is outlined in this Report has achieved its objectives in that a deposit that potentially could support mine development has been identified. The results of the PA indicate that additional drill testing is warranted and more detailed studies can be supported.

21.0 RECOMMENDATIONS

There is considerable upside potential to enhance the economics of the Thunder Bay North Project by increasing the Mineral Resource available for mining and/or reducing the capital and operating costs for mineral processing.

A two-phase program, consisting of exploration and optimization studies, is recommended for the Project, to support advancement of the Project to a more detailed study phase. The phases can be run concurrently, and are independent of each other.

Phase 1 comprises exploration drill programs. A winter reconnaissance drill and geophysical program is underway testing targets outside of the defined mineral resource and performing subsequent drilling within and marginal to the resource. A second program is predicated on the results of this work, and will consist of additional drilling. The planned exploration program is summarized in Table 21-1, and is estimated to cost about $7.95 M.

Phase 2 consists of review of the recommendations arising from the PA, and optimization studies. The optimization studies will assess ways of improving the overall economics of the Project. Once optimization is complete, the recommendations arising from the PA will be revisited and the future Project direction established. Costs are provided as a range for this work, as the estimate depends on whether work is performed by third-party consultants or by Magma Metals staff. Estimated total costs are $1.945 M to $2.475 M.

21.1 Phase 1 Exploration

21.1.1 Database and Data Collection

As a result of the data verification program on data collected on the Project to date, AMEC has proposed a number of recommendations that should be incorporated into Project activities. AMEC recommends that Magma Metals:

- Create a procedure for documenting changes to lithology codes such that the documentation becomes part of the permanent Project record.
- Evaluate all down-hole survey data prior to inclusion in the database.

  Use a gyroscopic tool for down-hole surveys in all drill holes. This will avoid problems caused by magnetite interfering with the Reflex and RADTOOL instruments.

Table 21-1: Phase 1 and Phase 2 Proposed Work Programs and Budgets

Item	Activity	Drill Holes	Drill Metres	Cost	Total Cost
Phase 1 - Exploration					
Note this portion of the program is underway					
Winter reconnaissance drilling at Current Lake, Beaver Lake, Escape Lake, Steepledge lake - program in progress as of report effective date	Ice and land based drilling and drill hole orientation surveys	53	9,600	$225/m	$2,160,000
Step-out drilling at east Beaver Lake to test potential resource extensions	Land based drilling and drill hole orientation surveys	18-20	10,500	$150/m	$1,575,000
South East Anomaly drilling	Land based drilling and drill hole orientation surveys	6-8	8,000	$175/m	$1,400,000
Regional Drilling to follow-up targets from Winter reconnaissance drilling	Land based drilling and drill hole orientation surveys	30-40	8,000	$225/m	$1,800,000
Geophysical surveys	Ground magnetics, gravity & EM surveys and down-hole EM surveys				$965,000
Geological research studies					50,000
Total Phase 1					*$7,950,000*
Phase 2 – Additional Studies					
Optimization					400,000
Engineering studies					$1,500,000–$2,000,000
Total Phase 2					*$1,900,000–2,400,000*
Total Phases 1 and 2					**$9,850,000–$10,350,000**

- Calibrate down-hole survey instruments on a rack with known azimuth and inclination prior to each use. This may eliminate some of the erratic readings from the Reflex instrument if it continues to be used.

These recommendations should be incorporated into regular day-to-day practices.

21.1.2 Winter Reconnaissance Drilling

A winter reconnaissance drill program was in progress at the effective date of this report and is planned to continue until late-March 2011. Seven of the planned 53 reconnaissance holes have been completed on the South East Anomaly and the East-West Connector areas of the Project. The remaining holes will test the North Current Lake, Current Lake South, Beaver Lake Deeps, Escape Lake, and Steepledge Lake South areas of the project. Based on an inclusive drilling cost, including assays and drill hole deviation surveys, of $225/m, Magma Metals estimates that the approximately 9,600 m of drilling will cost approximately $2.16 million.

Given the size of the Project and the number of prospective target areas identified from geophysical data, AMEC recommended in an earlier report that exploration and regional drilling should be continued, and the above Phase 1 program meets that recommendation by continuing exploration of previously-identified favourable host units at Steepledge Lake, Lone Island Lake, and the East–West Connector. Several under-explored areas will be assessed by this program.

21.1.3 Step-out Drilling

Step-out drilling is planned for the area east of the mineral resource in the Beaver Lake Zone. This program will consist of several drill fences to test potential southeast extensions of the mineral resource within the Current Lake Intrusive Complex. An approximately 10,500 m drilling program is planned. Based on an inclusive drilling cost, including assays and drill hole deviation surveys, of $150/m, Magma Metals estimates an approximate total cost of $1.58 million.

In addition, approximately 8,000 m of drilling is planned in the South East Anomaly area to investigate potentially deeper mineralization further to the east of the drilling described above. Based on an inclusive drilling cost, including assays and drill hole deviation surveys, of $175/m for deeper holes, Magma Metals estimates an approximate total cost of $1.40 million.

21.1.4 Regional Drilling

Approximately 8,000 m of drilling is planned to follow-up targets identified from the Winter reconnaissance drilling program. Much of this drilling is likely to require helicopter support. Based on an inclusive drilling cost, including assays and drill hole deviation surveys, of $225/m, Magma Metals estimates an approximate total cost of $1.80 million for this program.

21.1.5 Geophysics and Geological Research

Magma Metals is planning to undertake bore-hole EM geophysical surveys during and after the drilling programs described above, in order to detect any off-hole mineralization. In addition, and depending on results, surface EM surveys may also be undertaken. Approximately $600,000 has been budgeted for this work. Also, during the Winter Reconnaissance drill program it is planned to concurrently complete 5 surface geophysical surveys that will include both magnetic and gravity techniques. These surveys are expected to cost a total of approximately $365,000.

Geological research studies are planned to be completed on the mineralization and the host unit. Magma Metals plans to carefully select samples of drill core for petrographic description, and have such samples analysed via complete research-quality geochemical analyses. Analyses will include the major PGE elements and the trace elements rhodium, ruthenium, osmium and iridium. The budget for this work is estimated at about $50,000.

21.2 Phase 2 Optimization Studies

A number of recommendations were made as a result of the PA. However, prior to these recommendations being implemented, Magma will assess ways of improving the overall economics of the Project. The optimization program is projected to cost approximately $400,000. Recommended areas of study include:

- Mine Design - Review underground resources and combined open pit/underground mining options to determine scale of viable U/G resource base and optimal open pit/underground interface
- Mineral Processing – Evaluate alternative processing options to enhance project economics and reduce overall project risk
- Capital and Operating Costs – Further work is recommended to attempt to reduce the capital and operating costs used in the PA study
- Geochemistry – confirm the quantity of PAG rock in waste streams.

At the end of the optimization studies, Magma Metals will re-evaluate the recommendations arising from the PA, and proceed with those that are still relevant. Recommendations covered items such as engineering studies, metallurgical testwork, geotechnical and hydrogeological studies, environmental studies, and permitting and community relations. Depending on whether the work is performed by third-party consultants or Magma Metals staff, the work program based on the PA recommendations could range from $1.5 M to $2 M.

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23.0 DATE AND SIGNATURE PAGE

The effective date of this Technical Report, entitled “Magma Metals Limited, Thunder Bay North Polymetallic Project, Ontario, Canada, NI 43-101 Technical Report” is 17 March 2010.

“signed and sealed”

David Thomas, P.Geo., M.AusIMM Dated 23 March 2011

“signed and sealed”

Jay Melnyk, P.Eng. Dated 23 March 2011

“signed and sealed”

Dr. Lynton Gormely, P.Eng. Dated 23 March 2011

“signed”

Stella Searston, M.AusIMM. Dated 23 March 2011

“signed and sealed”

Greg Kulla, P.Geo. Dated 23 March 2011

APPENDIX A
MINERAL TENURE

Project	Township	Claim No.	Area (ha)	Area (ac)	Number of Units	Claim Status	Recording Date	Expiry Date	Amount Due	Credits	Work 1-Oct-09 to 30-Sept-10	Total Work	Recorded Claim Holders	Wind Power Application
Current Lake Property	Greenwich Lake	4240541	64	160	4	Active	3-Apr-08	3-Apr-12	$1,600		$3,200	$3,200	Magma Metals (Canada) Limited	
(TBN)	Greenwich Lake	4208977	208	520	13	Active	26-Oct-05	26-Oct-11	$5,200		$9,600	$20,800	Magma Metals (Canada) Limited	WP2008-101
	Greenwich Lake	4208978	240	600	15	Active	26-Oct-05	26-Oct-11	$6,000		$12,000	$24,000	Magma Metals (Canada) Limited	WP2008-101
	Greenwich Lake	4208979	240	600	15	Active	26-Oct-05	26-Oct-11	$6,000		$12,000	$24,000	Magma Metals (Canada) Limited	WP2008-101
	Greenwich Lake	4208980	240	600	15	Active	26-Oct-05	26-Oct-11	$6,000		$12,000	$24,000	Magma Metals (Canada) Limited	WP2008-101
	Greenwich Lake	4208981	240	600	15	Active	26-Oct-05	26-Oct-11	$6,000		$12,000	$24,000	Magma Metals (Canada) Limited	
	Greenwich Lake	4205378	64	160	4	Active	27-Oct-05	27-Oct-11	$1,600		$3,200	$6,400	Magma Metals (Canada) Limited	
	Greenwich Lake	4205432	48	120	3	Active	27-Oct-05	27-Oct-11	$1,200		$2,400	$4,800	Magma Metals (Canada) Limited	
	Greenwich Lake	4208965	256	640	16	Active	27-Oct-05	27-Oct-11	$6,400		$12,800	$25,600	Magma Metals (Canada) Limited	
	Greenwich Lake	4208966	256	640	16	Active	27-Oct-05	27-Oct-11	$6,400		$12,800	$25,600	Magma Metals (Canada) Limited	
	Greenwich Lake	4208967	256	640	16	Active	27-Oct-05	27-Oct-11	$6,400		$12,800	$25,600	Magma Metals (Canada) Limited	
	Greenwich Lake	4208968	256	640	16	Active	27-Oct-05	27-Oct-11	$6,400		$12,800	$25,600	Magma Metals (Canada) Limited	
	Greenwich Lake	4208969	256	640	16	Active	27-Oct-05	27-Oct-11	$6,400		$12,800	$25,600	Magma Metals (Canada) Limited	
	Greenwich Lake	4208970	256	640	16	Active	27-Oct-05	27-Oct-11	$6,400		$12,800	$25,600	Magma Metals (Canada) Limited	
	Greenwich Lake	4208971	128	320	8	Active	27-Oct-05	27-Oct-11	$3,200		$6,400	$12,800	Magma Metals (Canada) Limited	
	Greenwich Lake	4208972	256	640	16	Active	27-Oct-05	27-Oct-11	$6,400		$12,800	$25,600	Magma Metals (Canada) Limited	
	Greenwich Lake	4208973	256	640	16	Active	27-Oct-05	27-Oct-11	$6,400		$12,800	$25,600	Magma Metals (Canada) Limited	
	Greenwich Lake	4208974	256	640	16	Active	27-Oct-05	27-Oct-11	$6,400		$12,800	$25,600	Magma Metals (Canada) Limited	
	Greenwich Lake	4208975	16	40	1	Active	27-Oct-05	27-Oct-11	$400		$800	$1,600	Magma Metals (Canada) Limited	WP2008-100
	Greenwich Lake	4208976	64	160	4	Active	27-Oct-05	27-Oct-11	$1,600		$3,200	$6,400	Magma Metals (Canada) Limited	WP2008-100
	Greenwich Lake	4208984	240	600	15	Active	27-Oct-05	27-Oct-11	$6,000		$12,000	$24,000	Magma Metals (Canada) Limited	
	Greenwich Lake	1248239	176	440	11	Active	14-Dec-01	14-Dec-11	$4,400		$8,800	$35,200	Magma Metals (Canada) Limited	
	Greenwich Lake	1248241	240	600	15	Active	14-Dec-01	14-Dec-10	$6,000		$6,000	$42,000	Magma Metals (Canada) Limited	
	Greenwich Lake	1248244	96	240	6	Active	14-Dec-01	14-Dec-11	$2,400		$4,800	$19,200	Magma Metals (Canada) Limited	
	Greenwich Lake	1248240	144	360	9	Active	14-Dec-01	14-Dec-11	$3,600		$3,600	$28,800	Magma Metals (Canada) Limited	
	Greenwich Lake	842186	144	360	9	Active	30-Jul-01	30-Jul-14	$3,600	$1,649,263	$14,400	$39,600	Magma Metals (Canada) Limited	
	Greenwich Lake	842189	192	480	12	Active	30-Jul-01	30-Jul-13	$4,800	$916,270	$14,400	$48,000	Magma Metals (Canada) Limited	
Beaver Lake Option Property	Greenwich Lake	4210157	192	480	12	Active	10-May-06	10-May-16	$4,800	$4,450,288	$14,400	$38,400	Casimir Andrew Zimowski (50%) Ronald Anthony Pizzolato (50%)	
Casron Option Property	Tartan Lake	4211638	48	120	3	Active	10-Nov-06	10-Nov-11	$1,200		$2,400	$3,600	Casimir Andrew Zimowski (50%) Ronald Anthony Pizzolato (50%)	
	Tartan Lake	4211637	48	120	3	Active	22-Feb-07	22-Feb-12	$1,200		$2,400	$3,600	Casimir Andrew Zimowski (50%) Ronald Anthony Pizzolato (50%)	
	Tartan Lake	1246796	192	480	12	Active	19-Oct-06	19-Oct-11	$4,800		$9,600	$14,400	Casimir Andrew Zimowski (50%) Ronald Anthony Pizzolato (50%)	
Beck Property	Tartan Lake	4213439	48	120	3	Active	8-Feb-07	8-Feb-12	$1,200		$2,400	$3,600	Magma Metals (Canada) Limited	WP2008-186
	Tartan Lake	4214080	144	360	9	Active	8-Feb-07	8-Feb-12	$3,600		$7,200	$10,800	Magma Metals (Canada) Limited	WP2008-186
Beck Road Property	Tartan Lake	4243771	192	480	12	Active	28-May-08	28-May-11	$4,800		$4,800	$4,800	Magma Metals (Canada) Limited	WP2008-101, WP2008-186
	Tartan Lake	4243772	144	360	9	Active	28-May-08	28-May-11	$3,600		$3,600	$3,600	Magma Metals (Canada) Limited	WP2008-186
	Tartan Lake	4243773	192	480	12	Active	28-May-08	28-May-11	$4,800		$4,800	$4,800	Magma Metals (Canada) Limited	WP2008-186
	Tartan Lake	4243774	96	240	6	Active	28-May-08	28-May-11	$2,400		$2,400	$2,400	Magma Metals (Canada) Limited	WP2008-186
	Tartan Lake	4243775	64	160	4	Active	28-May-08	28-May-11	$1,600		$1,600	$1,600	Magma Metals (Canada) Limited	WP2008-186
	Tartan Lake	4243776	256	640	16	Active	28-May-08	28-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	WP2008-186
	Tartan Lake	4243777	256	640	16	Active	28-May-08	28-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	WP2008-186
	Tartan Lake	4243778	256	640	16	Active	28-May-08	28-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Tartan Lake	4243779	64	160	4	Active	28-May-08	28-May-11	$1,600		$1,600	$1,600	Magma Metals (Canada) Limited	WP2008-186
	Tartan Lake	4243780	240	600	15	Active	28-May-08	28-May-11	$6,000		$6,000	$6,000	Magma Metals (Canada) Limited	
	Tartan Lake	4243781	256	640	16	Active	28-May-08	28-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	

Project	Township	Claim No.	Area (ha)	Area (ac)	Number of Units	Claim Status	Recording Date	Expiry Date	Amount Due	Credits	Work 1-Oct-09 to 30-Sept-10	Total Work	Recorded Claim Holders	Wind Power Application
	Tartan Lake	4243782	256	640	16	Active	28-May-08	28-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Tartan Lake	4243783	256	640	16	Active	28-May-08	28-May-11	$3,740		$6,400	$6,400	Magma Metals (Canada) Limited	
	Tartan Lake	4243784	256	640	16	Active	28-May-08	28-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Tartan Lake	4243785	192	480	12	Active	28-May-08	28-May-11	$4,800		$4,800	$4,800	Magma Metals (Canada) Limited	
	Tartan Lake	4243786	192	480	12	Active	28-May-08	28-May-11	$4,800		$4,800	$4,800	Magma Metals (Canada) Limited	
	Tartan Lake	4243790	256	640	16	Active	28-May-08	28-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Tartan Lake	4243791	256	640	16	Active	28-May-08	28-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
Bittern Property	Tartan Lake	4214081	256	640	16	Active	31-Jan-07	31-Jan-12	$6,400		$12,800	$19,200	Magma Metals (Canada) Limited	
	Tartan Lake	4214082	192	480	12	Active	31-Jan-07	31-Jan-12	$4,800		$9,600	$14,400	Magma Metals (Canada) Limited	
	Tartan Lake	4214083	192	480	12	Active	31-Jan-07	31-Jan-12	$4,800		$9,600	$14,400	Magma Metals (Canada) Limited	
	Tartan Lake	4214084	256	640	16	Active	31-Jan-07	31-Jan-12	$6,400		$12,800	$19,200	Magma Metals (Canada) Limited	
Escape Creek Property	Onion Lake	4242801	256	640	16	Active	22-May-08	22-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Onion Lake	4242802	192	480	12	Active	22-May-08	22-May-11	$4,800		$4,800	$4,800	Magma Metals (Canada) Limited	
	Onion Lake	4242803	256	640	16	Active	22-May-08	22-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Onion Lake	4242804	192	480	12	Active	22-May-08	22-May-11	$4,800		$4,800	$4,800	Magma Metals (Canada) Limited	
	Onion Lake	4242805	256	640	16	Active	22-May-08	22-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Onion Lake	4242806	256	640	16	Active	22-May-08	22-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Onion Lake	4242807	192	480	12	Active	22-May-08	22-May-11	$4,800		$4,800	$4,800	Magma Metals (Canada) Limited	
	Onion Lake	4242808	96	240	6	Active	22-May-08	22-May-11	$2,400		$2,400	$2,400	Magma Metals (Canada) Limited	
	Onion Lake	4242809	96	240	6	Active	22-May-08	22-May-11	$2,400		$2,400	$2,400	Magma Metals (Canada) Limited	
	Onion Lake	4242810	80	200	5	Active	22-May-08	22-May-11	$2,000		$2,000	$2,000	Magma Metals (Canada) Limited	
	Tartan Lake	4242811	224	560	14	Active	22-May-08	22-May-11	$5,600		$5,600	$5,600	Magma Metals (Canada) Limited	
	Tartan Lake	4242812	224	560	14	Active	22-May-08	22-May-11	$5,600		$5,600	$5,600	Magma Metals (Canada) Limited	
	Tartan Lake	4242813	144	360	9	Active	22-May-08	22-May-11	$3,600		$3,600	$3,600	Magma Metals (Canada) Limited	
	Tartan Lake	4242814	144	360	9	Active	22-May-08	22-May-11	$3,600		$3,600	$3,600	Magma Metals (Canada) Limited	
Escape Lake Property	Tartan Lake	3005105	192	480	12	Active	23-Oct-07	23-Oct-11	$4,800		$4,800	$9,600	Magma Metals (Canada) Limited	
	Tartan Lake	3005106	48	120	3	Active	23-Oct-07	23-Oct-11	$1,200		$1,200	$2,400	Magma Metals (Canada) Limited	
	Tartan Lake	4225972	160	400	10	Active	23-Oct-07	23-Oct-11	$4,000		$4,000	$8,000	Magma Metals (Canada) Limited	
	Greenwich Lake	4225974	144	360	9	Active	26-Oct-07	26-Oct-11	$3,600		$3,600	$7,200	Magma Metals (Canada) Limited	
	Greenwich Lake	4225975	96	240	6	Active	26-Oct-07	26-Oct-12	$2,400	$684,014	$4,800	$7,200	Magma Metals (Canada) Limited	
	Hicks Lake	4225211	256	640	16	Active	13-Nov-07	13-Nov-10	$6,400			$6,400	Magma Metals (Canada) Limited	
	Onion Lake	4225213	192	480	12	Active	13-Nov-07	13-Nov-10	$4,800			$4,800	Magma Metals (Canada) Limited	
	Onion Lake	4225214	64	160	4	Active	13-Nov-07	13-Nov-10	$1,600		$400	$1,600	Magma Metals (Canada) Limited	
	Greenwich Lake	4225973	144	360	9	Active	23-Oct-07	23-Oct-11	$3,600		$3,600	$7,200	Magma Metals (Canada) Limited	
	Onion Lake	4225212	192	480	12	Active	13-Nov-07	13-Nov-11	$4,800		$4,800	$9,600	Magma Metals (Canada) Limited	
	Hicks Lake	4225215	80	200	5	Active	13-Nov-07	13-Nov-11	$2,000		$2,400	$4,000	Magma Metals (Canada) Limited	
	Greenwich Lake	4225216	144	360	9	Active	13-Nov-07	13-Nov-12	$3,600		$7,200	$10,800	Magma Metals (Canada) Limited	
Escape Road Property	Tartan Lake	4243631	256	640	16	Active	28-May-08	28-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Tartan Lake	4243632	256	640	16	Active	28-May-08	28-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	WP2008-101
	Tartan Lake	4243633	192	480	12	Active	28-May-08	28-May-11	$4,800		$4,800	$4,800	Magma Metals (Canada) Limited	WP2008-101, WP2008-186
	Tartan Lake	4243634	192	480	12	Active	28-May-08	28-May-11	$4,800		$4,800	$4,800	Magma Metals (Canada) Limited	WP2008-101, WP2008-186
	Tartan Lake	4243635	256	640	16	Active	28-May-08	28-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	WP2008-101, WP2008-186
	Tartan Lake	4243637	256	640	16	Active	28-May-08	28-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	WP2008-101, WP2008-186
	Tartan Lake	4243638	256	640	16	Active	28-May-08	28-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	WP2008-101, WP2008-186

Project	Township	Claim No.	Area (ha)	Area (ac)	Number of Units	Claim Status	Recording Date	Expiry Date	Amount Due	Credits	Work 1-Oct-09 to 30-Sept-10	Total Work	Recorded Claim Holders	Wind Power Application
	Tartan Lake	4243639	192	480	12	Active	28-May-08	28-May-11	$4,800		$4,800	$4,800	Magma Metals (Canada) Limited	WP2008-101, WP2008-186
	Tartan Lake	4243640	144	360	9	Active	28-May-08	28-May-11	$3,600		$3,600	$3,600	Magma Metals (Canada) Limited	WP2008-101, WP2008-186
	Tartan Lake	4243641	96	240	6	Active	28-May-08	28-May-11	$2,400		$2,400	$2,400	Magma Metals (Canada) Limited	WP2008-186
	Tartan Lake	4243642	96	240	6	Active	28-May-08	28-May-11	$2,400		$2,400	$2,400	Magma Metals (Canada) Limited	WP2008-101, WP2008-102, WP2008-186
	Tartan Lake	4243643	256	640	16	Active	28-May-08	28-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	WP2008-101, WP2008-102, WP2008-186
	Tartan Lake	4243644	96	240	6	Active	28-May-08	28-May-11	$2,400		$2,400	$2,400	Magma Metals (Canada) Limited	WP2008-101, WP2008-102, WP2008-186
	Tartan Lake	4243645	96	240	6	Active	28-May-08	28-May-11	$2,400		$2,400	$2,400	Magma Metals (Canada) Limited	WP2008-102
	Tartan Lake	4243646	64	160	4	Active	28-May-08	28-May-11	$1,600		$1,600	$1,600	Magma Metals (Canada) Limited	WP2008-102, WP2008-186
	Tartan Lake	4243647	224	560	14	Active	28-May-08	28-May-11	$5,600		$5,600	$5,600	Magma Metals (Canada) Limited	WP2008-102, WP2008-186
	Tartan Lake	4243648	144	360	9	Active	28-May-08	28-May-11	$3,600		$3,600	$3,600	Magma Metals (Canada) Limited	
	Tartan Lake	4243649	192	480	12	Active	28-May-08	28-May-11	$4,800		$4,800	$4,800	Magma Metals (Canada) Limited	WP2008-101
	Tartan Lake	4243650	16	40	1	Active	28-May-08	28-May-11	$400		$400	$400	Magma Metals (Canada) Limited	WP2008-101, WP2008-186
	Tartan Lake	4243651	64	160	4	Active	28-May-08	28-May-11	$1,600		$1,600	$1,600	Magma Metals (Canada) Limited	WP2008-101, WP2008-186
	Tartan Lake	4243652	240	600	15	Active	28-May-08	28-May-11	$6,000		$6,000	$6,000	Magma Metals (Canada) Limited	WP2008-101, WP2008-186
Fitzpatrick Property	Tartan Lake	4214075	240	600	15	Active	31-Jan-07	31-Jan-12	$6,000		$12,000	$18,000	Magma Metals (Canada) Limited	
	Tartan Lake	4214076	240	600	15	Active	31-Jan-07	31-Jan-12	$6,000		$12,000	$18,000	Magma Metals (Canada) Limited	
Furcate Property	Dorion	4226068	256	640	16	Active	13-Nov-07	13-Nov-11	$6,400		$6,400	$12,800	Magma Metals (Canada) Limited	WP2006-01, WP2008-104, WP2008-105, WP2008-106
	Dorion	4228020	192	480	12	Active	13-Nov-07	13-Nov-11	$4,800		$4,800	$9,600	Magma Metals (Canada) Limited	WP2006-01, WP2008-104, WP2008-105, WP2008-106
	Dorion	4208486	192	480	12	Active	8-Feb-07	8-Feb-12	$4,800		$9,600	$14,400	Magma Metals (Canada) Limited	WP2006-01, WP2008-104, WP2008-105
	Dorion	4214124	96	240	6	Active	8-Feb-07	8-Feb-12	$2,400		$4,800	$7,200	Magma Metals (Canada) Limited	WP2006-01, WP2008-104, WP2008-105, WP2008-106
Greenwich Gap Property	Greenwich Lake	4229971	128	320	8	Active	23-May-08	23-May-11	$3,200		$3,200	$3,200	Magma Metals (Canada) Limited	WP2006-01, WP2008-105
	Greenwich Lake	4229972	128	320	8	Active	23-May-08	23-May-11	$3,200		$3,200	$3,200	Magma Metals (Canada) Limited	WP2006-01, WP2008-102, WP2008-105
	Tartan Lake	4229973	128	320	8	Active	23-May-08	23-May-11	$3,200		$3,200	$3,200	Magma Metals (Canada) Limited	WP2008-105
	Greenwich Lake	4229974	256	640	16	Active	23-May-08	23-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	WP2008-105
	Greenwich Lake	4229975	128	320	8	Active	23-May-08	23-May-11	$3,200		$3,200	$3,200	Magma Metals (Canada) Limited	WP2006-01, WP2008-102
	Greenwich Lake	4242771	192	480	12	Active	23-May-08	23-May-11	$4,800		$4,800	$4,800	Magma Metals (Canada) Limited	
	Greenwich Lake	4242772	256	640	16	Active	23-May-08	23-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	WP2006-01, WP2008-102, WP2008-103, WP2008-104, WP2008-105
	Greenwich Lake	4242773	96	240	6	Active	23-May-08	23-May-11	$2,400		$2,400	$2,400	Magma Metals (Canada) Limited	WP2006-01, WP2008-102
	Greenwich Lake	4242774	256	640	16	Active	23-May-08	23-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	WP2006-01, WP2008-102, WP2008-103
	Greenwich Lake	4242775	192	480	12	Active	23-May-08	23-May-11	$4,800		$4,800	$4,800	Magma Metals (Canada) Limited	WP2008-102
Greenwich Lake Property	Greenwich Lake	4216374	96	240	6	Active	5-Jul-07	5-Jul-11	$2,400		$2,400	$4,800	Magma Metals (Canada) Limited	WP2008-102

Project	Township	Claim No.	Area (ha)	Area (ac)	Number of Units	Claim Status	Recording Date	Expiry Date	Amount Due	Credits	Work 1-Oct-09 to 30-Sept-10	Total Work	Recorded Claim Holders	Wind Power Application
	Tartan Lake	4218927	192	480	12	Active	5-Jul-07	5-Jul-11	$4,800		$4,800	$9,600	Magma Metals (Canada) Limited	WP2006-01, WP2008-102
	Greenwich Lake	4222632	128	320	8	Active	5-Jul-07	5-Jul-11	$3,200		$3,200	$6,400	Magma Metals (Canada) Limited	WP2008-101
	Greenwich Lake	4222633	256	640	16	Active	5-Jul-07	5-Jul-11	$6,400		$6,400	$12,800	Magma Metals (Canada) Limited	WP2008-101, WP2008-102
	Tartan Lake	4222634	256	640	16	Active	5-Jul-07	5-Jul-11	$6,400		$6,400	$12,800	Magma Metals (Canada) Limited	WP2008-101, WP2008-102
	Tartan Lake	4222635	128	320	8	Active	5-Jul-07	5-Jul-11	$3,200		$3,200	$6,400	Magma Metals (Canada) Limited	WP2008-101
	Tartan Lake	4222636	192	480	12	Active	5-Jul-07	5-Jul-11	$4,800		$4,800	$9,600	Magma Metals (Canada) Limited	WP2008-101
	Greenwich Lake	4222637	128	320	8	Active	5-Jul-07	5-Jul-11	$3,200		$3,200	$6,400	Magma Metals (Canada) Limited	WP2006-01, WP2008-102
	Tartan Lake	4222638	128	320	8	Active	5-Jul-07	5-Jul-11	$3,200		$3,200	$6,400	Magma Metals (Canada) Limited	WP2006-01, WP2008-102, WP2008-105
	Tartan Lake	4222639	192	480	12	Active	5-Jul-07	5-Jul-11	$4,800		$4,800	$9,600	Magma Metals (Canada) Limited	WP2006-01, WP2008-102
	Tartan Lake	4222640	256	640	16	Active	5-Jul-07	5-Jul-11	$6,400		$6,400	$12,800	Magma Metals (Canada) Limited	WP2006-01, WP2008-102
	Tartan Lake	4222650	48	120	3	Active	5-Jul-07	5-Jul-11	$1,200		$1,200	$2,400	Magma Metals (Canada) Limited	WP2008-102
	Greenwich Lake	4211163	192	480	12	Active	31-Jan-07	31-Jan-12	$4,800		$4,800	$14,400	Magma Metals (Canada) Limited	WP2008-102
	Greenwich Lake	4222631	192	480	12	Active	5-Jul-07	5-Jul-12	$1,200	$96,087	$18,000	$18,000	Magma Metals (Canada) Limited	WP2008-101
Hicks Lake Property	Hicks Lake	3018014	256	640	16	Active	7-Oct-08	7-Oct-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Hicks Lake	3018015	256	640	16	Active	7-Oct-08	7-Oct-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Hicks Lake	3018016	256	640	16	Active	7-Oct-08	7-Oct-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Hicks Lake	3018017	256	640	16	Active	7-Oct-08	7-Oct-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Hicks Lake	3018018	240	600	15	Active	7-Oct-08	7-Oct-11	$6,000		$6,000	$6,000	Magma Metals (Canada) Limited	
	Hicks Lake	3018019	256	640	16	Active	7-Oct-08	7-Oct-11	$6,240		$6,420	$6,420	Magma Metals (Canada) Limited	
	Hicks Lake	3018028	256	640	16	Active	7-Oct-08	7-Oct-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Hicks Lake	3018055	256	640	16	Active	7-Oct-08	7-Oct-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Hicks Lake	3018056	256	640	16	Active	7-Oct-08	7-Oct-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Hicks Lake	3018057	256	640	16	Active	7-Oct-08	7-Oct-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Hicks Lake	3018058	240	600	15	Active	7-Oct-08	7-Oct-11	$6,000		$6,000	$6,000	Magma Metals (Canada) Limited	
	Hicks Lake	3018059	128	320	8	Active	7-Oct-08	7-Oct-11	$3,200		$3,200	$3,200	Magma Metals (Canada) Limited	
	Greenwich Lake	4240095	256	640	16	Active	7-Oct-08	7-Oct-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Greenwich Lake	4240097	256	640	16	Active	7-Oct-08	7-Oct-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Hicks Lake	4241533	256	640	16	Active	7-Oct-08	7-Oct-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Hicks Lake	4241534	256	640	16	Active	7-Oct-08	7-Oct-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Hicks Lake	4241535	128	320	8	Active	7-Oct-08	7-Oct-11	$3,200		$3,200	$3,200	Magma Metals (Canada) Limited	
	Hicks Lake	4241536	128	320	8	Active	7-Oct-08	7-Oct-11	$3,200		$3,200	$3,200	Magma Metals (Canada) Limited	
	Hicks Lake	4241537	256	640	16	Active	7-Oct-08	7-Oct-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Hicks Lake	4241716	128	320	8	Active	7-Oct-08	7-Oct-11	$3,200		$3,200	$3,200	Magma Metals (Canada) Limited	
	Hicks Lake	4241717	256	640	16	Active	7-Oct-08	7-Oct-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Hicks Lake	4241718	128	320	8	Active	7-Oct-08	7-Oct-11	$3,200		$3,200	$3,200	Magma Metals (Canada) Limited	
	Hicks Lake	4241719	128	320	8	Active	7-Oct-08	7-Oct-11	$3,200		$3,200	$3,200	Magma Metals (Canada) Limited	
	Hicks Lake	4241720	256	640	16	Active	7-Oct-08	7-Oct-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Hicks Lake	4241727	256	640	16	Active	7-Oct-08	7-Oct-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Greenwich Lake	4245129	192	480	12	Active	7-Oct-08	7-Oct-11	$4,800		$4,800	$4,800	Magma Metals (Canada) Limited	
Hilltop Property	Tartan Lake	4214077	144	360	9	Active	31-Jan-07	31-Jan-12	$3,600		$7,200	$10,800	Magma Metals (Canada) Limited	
Lone Island Lake Property	Hicks Lake	4214273	256	640	16	Active	12-Mar-07	12-Mar-15	$6,400	$8,858	$32,000	$38,400	Magma Metals (Canada) Limited	
Lone Island West Property	Onion Lake	4221361	192	480	12	Active	5-May-08	5-May-11	$4,800		$4,800	$4,800	Magma Metals (Canada) Limited	
	Onion Lake	4221362	256	640	16	Active	5-May-08	5-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Hicks Lake	4221363	256	640	16	Active	5-May-08	5-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Onion Lake	4221365	256	640	16	Active	5-May-08	5-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
Loon Lake Property	Tartan Lake	4243787	96	240	6	Active	28-May-08	28-May-10	$2,400		$2,400	$2,400	Magma Metals (Canada) Limited	

Project	Township	Claim No.	Area (ha)	Area (ac)	Number of Units	Claim Status	Recording Date	Expiry Date	Amount Due	Credits	Work 1-Oct-09 to 30-Sept-10	Total Work	Recorded Claim Holders	Wind Power Application
	Tartan Lake	4243788	128	320	8	Active	28-May-08	28-May-10	$3,200		$3,200	$3,200	Magma Metals (Canada) Limited	
	Tartan Lake	4243789	96	240	6	Active	28-May-08	28-May-10	$2,400		$2,400	$2,400	Magma Metals (Canada) Limited	
	Tartan Lake	4240542	128	320	8	Active	3-Apr-08	3-Apr-11	$3,200		$6,400	$6,400	Magma Metals (Canada) Limited	
	Tartan Lake	4240543	256	640	16	Active	3-Apr-08	3-Apr-11	$6,400		$12,800	$12,800	Magma Metals (Canada) Limited	
	Tartan Lake	4240544	192	480	12	Active	3-Apr-08	3-Apr-11	$4,800		$7,198	$7,198	Magma Metals (Canada) Limited	
	Tartan Lake	4240545	96	240	6	Active	3-Apr-08	3-Apr-11	$2,400		$2,400	$2,400	Magma Metals (Canada) Limited	
Mackenzie Property	Tartan Lake	4225217	240	600	15	Active	13-Nov-07	13-Nov-10	$6,000		$6,000	$12,000	Magma Metals (Canada) Limited	
	Tartan Lake	4225218	240	600	15	Active	13-Nov-07	13-Nov-10	$6,000		$6,000	$12,000	Magma Metals (Canada) Limited	WP2008-105
	Dorion	4225219	192	480	12	Active	13-Nov-07	13-Nov-10	$4,800		$4,800	$9,600	Magma Metals (Canada) Limited	WP2008-105
	Greenwich Lake	4225220	256	640	16	Active	13-Nov-07	13-Nov-10	$6,400		$6,400	$12,800	Magma Metals (Canada) Limited	WP2006-01, WP2008-105
	Dorion	4226065	192	480	12	Active	13-Nov-07	13-Nov-10	$4,800		$4,800	$9,600	Magma Metals (Canada) Limited	WP2006-01, WP2008-105
	Dorion	4226067	128	320	8	Active	13-Nov-07	13-Nov-10	$3,200		$3,200	$6,400	Magma Metals (Canada) Limited	WP2006-01, WP2008-105, WP2008-106, WP2008-260
	Dorion	4214118	256	640	16	Active	31-Jan-07	31-Jan-11	$6,400		$12,800	$19,200	Magma Metals (Canada) Limited	WP2008-105, WP2008-106, WP2008-260
Question Mark Property	Dorion	4226066	256	640	16	Active	13-Nov-07	13-Nov-10	$6,400		$6,400	$12,800	Magma Metals (Canada) Limited	WP2008-260
	McTavish	4214079	128	320	8	Active	31-Jan-07	31-Jan-11	$3,200		$6,400	$9,600	Magma Metals (Canada) Limited	WP2008-105
	McTavish	4214117	128	320	8	Active	31-Jan-07	31-Jan-11	$3,200		$6,400	$9,600	Magma Metals (Canada) Limited	
	McTavish	4214119	256	640	16	Active	31-Jan-07	31-Jan-11	$6,400		$12,800	$19,200	Magma Metals (Canada) Limited	
Steepledge Property	Greenwich Lake	4240537	240	600	15	Active	3-Apr-08	3-Apr-11	$6,000		$12,000	$12,000	Magma Metals (Canada) Limited	
	Hicks Lake	4240538	192	480	12	Active	3-Apr-08	3-Apr-11	$4,800		$9,600	$9,600	Magma Metals (Canada) Limited	
	Hicks Lake	4240539	192	480	12	Active	3-Apr-08	3-Apr-11	$4,800		$9,600	$9,600	Magma Metals (Canada) Limited	
	Hicks Lake	4240540	64	160	4	Active	3-Apr-08	3-Apr-11	$1,600		$3,200	$3,200	Magma Metals (Canada) Limited	
	Hicks Lake	4221366	80	200	5	Active	5-May-08	5-May-11	$2,000		$2,000	$2,000	Magma Metals (Canada) Limited	
	Hicks Lake	4221367	64	160	4	Active	5-May-08	5-May-11	$1,600		$1,600	$1,600	Magma Metals (Canada) Limited	
	Hicks Lake	4221368	192	480	12	Active	5-May-08	5-May-11	$4,800		$4,800	$4,800	Magma Metals (Canada) Limited	
	Hicks Lake	4221369	192	480	12	Active	5-May-08	5-May-11	$4,800		$4,800	$4,800	Magma Metals (Canada) Limited	
	Greenwich Lake	4221370	240	600	15	Active	5-May-08	5-May-11	$6,000		$6,000	$6,000	Magma Metals (Canada) Limited	
	Greenwich Lake	4242141	256	640	16	Active	12-May-08	12-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Greenwich Lake	4242142	192	480	12	Active	12-May-08	12-May-11	$4,800		$4,800	$4,800	Magma Metals (Canada) Limited	
	Greenwich Lake	4242143	112	280	7	Active	12-May-08	12-May-11	$2,800		$2,800	$2,800	Magma Metals (Canada) Limited	
	Greenwich Lake	4242144	192	480	12	Active	12-May-08	12-May-11	$4,800		$4,800	$4,800	Magma Metals (Canada) Limited	
	Hicks Lake	4242145	128	320	8	Active	12-May-08	12-May-11	$3,200		$3,200	$3,200	Magma Metals (Canada) Limited	
	Hicks Lake	4242146	240	600	15	Active	12-May-08	12-May-11	$6,000		$6,000	$6,000	Magma Metals (Canada) Limited	
	Hicks Lake	4242147	176	440	11	Active	12-May-08	12-May-11	$4,400		$4,400	$4,400	Magma Metals (Canada) Limited	
	Hicks Lake	4242148	256	640	16	Active	12-May-08	12-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Greenwich Lake	4240536	240	600	15	Active	3-Apr-08	3-Apr-13	$6,000	$1,124,973	$18,000	$18,000	Magma Metals (Canada) Limited	
	Hicks Lake	4221364	256	640	16	Active	5-May-08	5-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
Tartan Lake Property	Tartan Lake	4243653	240	600	15	Active	28-May-08	28-May-11	$6,000		$6,000	$6,000	Magma Metals (Canada) Limited	
	Tartan Lake	4243654	240	600	15	Active	28-May-08	28-May-11	$6,000		$6,000	$6,000	Magma Metals (Canada) Limited	
	Tartan Lake	4243656	96	240	6	Active	28-May-08	28-May-11	$2,400		$2,400	$2,400	Magma Metals (Canada) Limited	
	Tartan Lake	4243657	192	480	12	Active	28-May-08	28-May-11	$4,800		$4,800	$4,800	Magma Metals (Canada) Limited	
	Tartan Lake	4243658	192	480	12	Active	28-May-08	28-May-11	$4,800		$4,800	$4,800	Magma Metals (Canada) Limited	
	Tartan Lake	4243659	256	640	16	Active	28-May-08	28-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
	Tartan Lake	4243660	256	640	16	Active	28-May-08	28-May-11	$6,400		$6,400	$6,400	Magma Metals (Canada) Limited	
Twenty Minute Property	Tartan Lake	4225183	256	640	16	Active	26-Nov-07	26-Nov-10	$6,400		$6,400	$12,800	Magma Metals (Canada) Limited	
	Tartan Lake	4225184	256	640	16	Active	26-Nov-07	26-Nov-10	$6,400		$6,400	$12,800	Magma Metals (Canada) Limited	
	Tartan Lake	4225186	32	80	2	Active	26-Nov-07	26-Nov-10	$800		$800	$1,600	Magma Metals (Canada) Limited	

Project	Township	Claim No.	Area (ha)	Area (ac)	Number of Units	Claim Status	Recording Date	Expiry Date	Amount Due	Credits	Work 1-Oct-09 to 30-Sept-10	Total Work	Recorded Claim Holders	Wind Power Application
	Tartan Lake	4225187	192	480	12	Active	26-Nov-07	26-Nov-10	$4,800		$4,800	$9,600	Magma Metals (Canada) Limited	
	Tartan Lake	4228021	256	640	16	Active	26-Nov-07	26-Nov-10	$6,400		$6,400	$12,800	Magma Metals (Canada) Limited	
	Tartan Lake	4228022	16	40	1	Active	26-Nov-07	26-Nov-10	$400		$400	$800	Magma Metals (Canada) Limited	
	Tartan Lake	4228023	96	240	6	Active	26-Nov-07	26-Nov-10	$2,400		$2,400	$4,800	Magma Metals (Canada) Limited	
	Tartan Lake	4228024	128	320	8	Active	26-Nov-07	26-Nov-10	$3,200		$3,200	$6,400	Magma Metals (Canada) Limited	
	Tartan Lake	4228025	256	640	16	Active	26-Nov-07	26-Nov-10	$6,400		$6,400	$12,800	Magma Metals (Canada) Limited	
	Tartan Lake	4208485	256	640	16	Active	7-Feb-07	7-Feb-11	$6,400		$12,800	$19,200	Magma Metals (Canada) Limited	
	Tartan Lake	4215436	128	320	8	Active	7-Feb-07	7-Feb-11	$3,200		$6,400	$9,600	Magma Metals (Canada) Limited	