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## **MUSTANG MINERALS CORP.**

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# **TECHNICAL REPORT ON THE PRELIMINARY ECONOMIC ASSESSMENT OF THE COMBINED MAYVILLE-MAKWA PROJECT, MANITOBA, CANADA**

**NI 43-101 Report**

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# 1 SUMMARY

## EXECUTIVE SUMMARY

Roscoe Postle Associates Inc. (RPA) was retained by Mustang Minerals Inc. (Mustang) to prepare an independent Technical Report on the combined Mayville and Makwa nickel-copper-cobalt-palladium project (the Project) located in east central Manitoba, Canada. The purpose of this report is to disclose the results of a Preliminary Economic Assessment (PEA) on the Project. This Technical Report conforms to Canadian National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101). RPA has visited the property several times, most recently on September 17, 2013.

Mustang is a Canadian publicly traded mining company with a portfolio of exploration and development projects of nickel, copper, and platinum group element (PGE) deposits in North America. Mustang has an 89.04% interest in the group of claims which includes the M2 Deposit and a 100% interest in the other claims at the Mayville Property. Mustang also has a 100% (subject to a Net Smelter Return royalty) interest in the Makwa Nickel Property which hosts the Makwa Nickel Deposit located 43 km to the south of the Mayville Property.

Mayville is considered a copper dominant deposit, with lesser contributions of nickel and palladium magmatic segregation. Makwa is a nickel dominant deposit with lesser contributions of copper, palladium, and cobalt.

The PEA is based on a conventional truck and shovel operation with two open pits (one at Mayville and one at Makwa) and recovery by flotation concentration of the mineralized material at a central mill. Mining will start at Makwa, followed by Mayville, and will be at an average rate of 8,219 tonnes per day (tpd) of mineralized material and a maximum of 82,000 tpd of total material mined. The total Project life is proposed to be 14 years, including four years for Makwa, eight years for Mayville, and four years for stockpiles. Makwa and Mayville mineralization will be processed in concurrent years, and the low grade stockpiles will be processed at the end of the Project life. The concentrator location is proposed to be at the Mayville site, and Makwa material will be trucked to the Mayville concentrator, a distance of approximately 43 km.

This report is considered by RPA to meet the requirements of a PEA as defined in Canadian NI 43-101 regulations. The economic analysis contained in this report is based, in part, on Inferred Resources, and is preliminary in nature. Inferred Resources are considered too geologically speculative to have mining and economic considerations applied to them and to be categorized as Mineral Reserves. There is no certainty that economic forecasts on which this PEA is based will be realized.

## ECONOMIC ANALYSIS

Pre-tax and after-tax cash flow projections have been generated from the Life of Mine (LOM) production schedule and capital and operating cost estimates, and are summarized in Table 1-1.

**TABLE 1-1 SUMMARY OF MAYVILLE-MAKWA CASH FLOW SUMMARY**  
**Mustang Minerals Corp. – Makwa-Mayville Project**

<b>Description</b>	<b>Unit</b>	<b>Value</b>
Pre-Tax IRR	%	17
Pre-tax NPV at 0.0% discount rate	C\$000	336,474
Pre-tax NPV at 7.5% discount rate	C\$000	109,058
Pre-tax NPV at 10% discount rate	C\$000	68,089
After-Tax IRR	%	16
After-tax NPV at 0.0% discount rate	C\$000	314,484
After-Tax NPV at 7.5% discount rate	C\$000	97,441
After-Tax NPV at 10% discount rate	C\$000	58,480

A summary of the key criteria is provided below.

### **ECONOMIC CRITERIA**

#### **Revenue**

- Approximately 8,300 mineralized tonnes per day processed from two separate open pits (approximately three million tonnes per year).
- Processing recoveries for the metals are as follows:
  - Makwa – 73.8% for nickel, 80.0% for copper, 39.9% for cobalt, 64.6% for platinum, 14.0% for gold, and 74.9% for palladium;
  - Mayville – 40.0% for nickel, 90.0% for copper, 32.0% for platinum, 55.0% for gold, and 80.0% for palladium.
- Gold, platinum, and palladium content at refinery varies for each concentrate.

- Exchange rate US\$1.00 = C\$1.11.
- Metal prices for cash flow: US\$8.50/lb – nickel; US\$3.40/lb – copper, US\$1,650/oz – gold; US\$14.00/lb - cobalt; US\$1,800/oz – platinum; and US\$800/oz – palladium.
- Nickel, copper, cobalt, platinum, palladium, and gold gross revenue percentage contributions are 44.3%, 46.8%, 0.3%, 1.8%, 5.0%, and 1.4%, respectively.
- Net Smelter Return (NSR) includes refining, transport, and insurance costs.
- No salvage value was applied to any of the equipment or infrastructure.
- Project Life: 14 years.
- Makwa Mine Life: 4 years.
- Mayville Mine Life: 8 years, plus 4 years of stockpile processing.
- Yearly revenues were calculated by subtracting the applicable refining charges and transportation costs from the payable metal value.
- Revenue is recognized at the time of production.
- There are 5.4 Mt of Inferred Resource used in the production schedule.

### **Costs**

- Pre-production period: 24 months (Year -2 and Year -1).
- Unit operating costs for mining, processing, power, fuel, and general and administration (G&A) were applied to annual mined/processed tonnages, to determine the overall yearly operating cost.
- Mine life capital totals US\$300.7 million, including reclamation.

### **Royalties**

- An existing royalty agreement for 1% of NSR on the Makwa Property may be reduced to 0.5% by payment by Mustang of C\$500,000 to Global Nickel Inc.

### **Taxation**

The after-tax cash flow model contained in this report includes the application of the tax rates and rules provided by the client.

### **CASH FLOW ANALYSIS**

The financial model was established on a 100% equity basis, which does not include debt financing and loan interest charges.

Considering the Project on a stand-alone basis, the undiscounted after-tax cash flow totals \$314.5 million over the mine life, and simple payback occurs approximately 3.5 years from start of production.

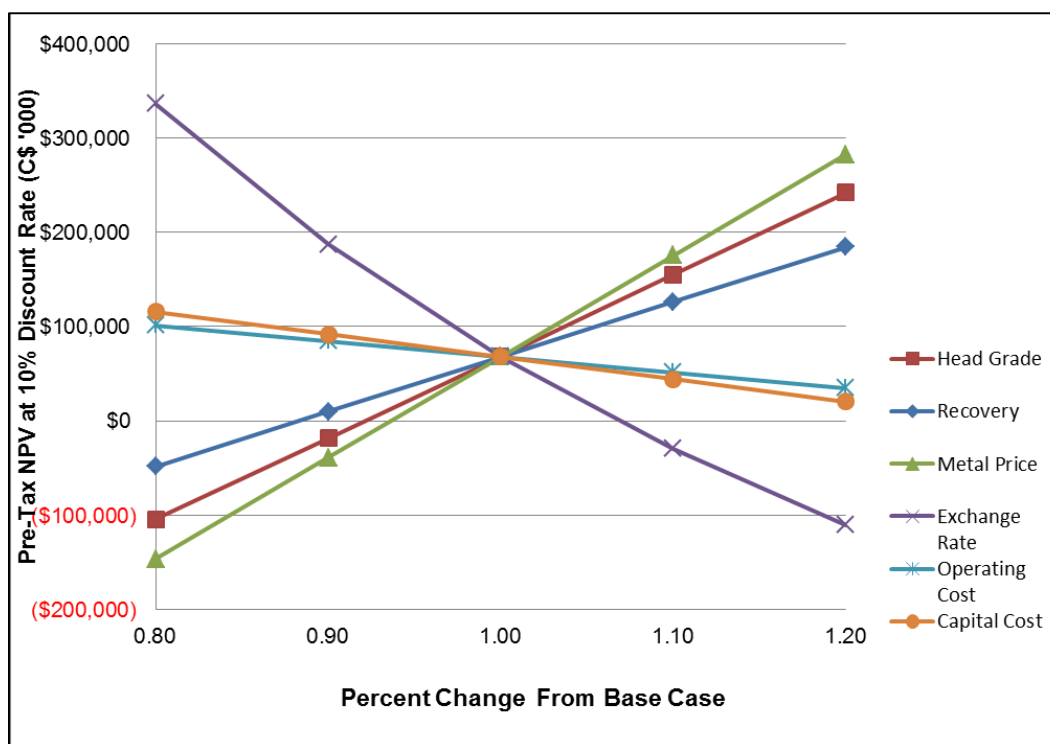
A pre-tax net present value (NPV) at a 7.5% discount rate is \$109.1 million and the pre-tax internal rate of return (IRR) is 17%. An after-tax NPV at a 7.5% discount rate is approximately US\$97.4 million, with an IRR of 16%.

### **SENSITIVITY ANALYSIS**

Project risks can be identified in both economic and non-economic terms. Key economic risks were examined by running cash flow sensitivities:

- Nickel price;
- Copper price;
- Palladium price
- Platinum price;
- Cobalt price
- Head Grades;
- Recoveries;
- Operating costs; and
- Pre-production capital costs.

NPV sensitivity over the base case has been calculated for -20% to +20% variations. The sensitivities are shown in Figure 1-1 and Table 1-2.

**FIGURE 1-1 SENSITIVITY ANALYSIS**

**TABLE 1-2 SENSITIVITY ANALYSES**  
**Mustang Minerals Corp. – Makwa-Mayville Project**

Parameter Variables	Units	-20%	-10%	Base	10%	20%
Nickel Price	US\$/lb	7.56	8.50	9.44	10.39	11.33
Exchange Rate	US\$/C\$	0.72	0.81	0.90	0.99	1.08
Head Grade (Nickel Only)	%	0.33%	0.38%	0.42%	0.46%	0.50%
Total Cash Cost	\$millions	1,053.9	1,078.1	1,102.4	1,126.6	1,150.9
Total Capital Cost	\$millions	240.6	270.6	300.7	330.8	360.8
Pre-Tax NPV @ 10%	Units	-20%	-10%	Base	10%	20%
Nickel Price	\$millions	(\$146.4)	(\$39.2)	\$68.1	\$175.3	\$282.6
Exchange Rate	\$millions	\$336.2	\$187.3	\$68.1	(\$29.4)	(\$110.7)
Head Grade (Nickel Only)	\$millions	(\$104.2)	(\$18.3)	\$68.1	\$154.9	\$242.0
Total Cash Cost	\$millions	\$101.5	\$84.8	\$68.1	\$51.4	\$34.6
PPD Capital Cost	\$millions	\$115.6	\$91.8	\$68.1	\$44.3	\$20.6

## CONCLUSIONS

RPA offers the following conclusions:

### GEOLOGY AND MINERAL RESOURCES

- Work to date on the geological interpretation and modelling of the Makwa and Mayville deposits is appropriate for the current level of evaluation.
- The exploration work, including drilling, sampling, and database management, meets industry standard practices. The drill hole databases are valid and suitable to estimate Mineral Resources for the Project.
- RPA updated the Mineral Resource estimates for the Makwa and Mayville deposits using drill hole data available to October 2009 and December 2013, respectively. Since the database cut-off dates, a minor amount of drilling has been done on both properties. RPA reviewed results from the new drilling in section and level plan and confirmed that those data would have only a minor impact on the local grade estimate and that overall the block models are still valid and current. The Mineral Resource statements for both deposits reflect updated and current economic factors. The Mineral Resources are constrained within a preliminary open pit and are reported in Table 1-3.

**TABLE 1-3 MINERAL RESOURCE SUMMARY AS OF NOVEMBER 27, 2013**  
**Mustang Minerals Corp. – Makwa-Mayville Project**

Class and Deposit	Tonnes (Mt)	Ni (%)	Cu (%)	Pt (g/t)	Pd (g/t)	Au (g/t)	Co (%)
<b>Indicated</b>							
Makwa	7.2	0.61	0.13	0.10	0.36	N/A	0.01
Mayville	26.6	0.18	0.44	0.05	0.14	0.05	N/A
<b>Total Indicated</b>	<b>33.8</b>	<b>0.27</b>	<b>0.37</b>	<b>0.06</b>	<b>0.19</b>	N/A	N/A
<b>Inferred</b>							
Makwa	0.7	0.27	0.08	0.05	0.14	N/A	0.02
Mayville	5.2	0.19	0.48	0.06	0.15	0.04	N/A
<b>Total Inferred</b>	<b>5.8</b>	<b>0.19</b>	<b>0.43</b>	<b>0.06</b>	<b>0.15</b>	N/A	N/A

Notes:

1. CIM definitions have been followed for classification of Mineral Resources.
2. Mineral Resources are reported at a net smelter return (NSR) cut-off value of C\$15/tonne at Mayville and C\$20.64/tonne at Makwa
3. At Mayville, NSR values are calculated in C\$ using factors of \$51 per % Cu and \$41 per % Ni. These factors are based on metal prices of US\$3.40/lb Cu and US\$8.50/lb Ni, estimated recoveries and smelter terms, and a US\$/C\$ exchange rate of 0.97.
4. The Mineral Resources are estimated using metal prices of US\$3.40/lb Cu and US\$8.50/lb Ni, estimated recoveries and smelter terms, and a US\$/C\$ exchange rate of 0.97. The NSR factors used are: \$87.33 per % Ni, \$29.65 per % Cu, \$38.25 per % Co, \$0.14 per g/t Pt and 0.08 per g/t Pd.
5. Totals may not add correctly due to rounding.

### MINING AND MINERAL RESERVES

- Conventional open pit mining methods (drilling, blasting, loading, and hauling) will be employed to extract the mineralized material and waste.

- Mining will start at Makwa, with production from a single pit, followed by a single open pit at Mayville. Pit benches will be five metres high for Makwa and ten metres high for Mayville.
- Mining will be conducted by Mustang.
- There are no current Mineral Reserves at the Project. The PEA is based on those Mineral Resources with reasonable prospects for economic extraction by open pit mining and flotation recovery.
  - Approximately 39.1 Mt at an average grade of 0.25% Ni and an average grade of 0.37% Cu, factored for dilution and extraction, are potentially mineable by open pit methods. Approximately 33.6 Mt of these resources are classified as Indicated and 5.4 Mt, as Inferred.
  - The LOM stripping ratio is 7.9:1 for Makwa and 6.0:1 for Mayville.
  - At an average production rate of approximately 8,200 tpd, or 3.0 Mtpa, the Project life is approximately 14 years, with four years of mining at Makwa and eight years of mining at Mayville, plus four years of stockpile processing.
- Both the Makwa and Mayville pits will require dewatering.
- Topographical relief, climate, haul distances, and political location do not appear to be issues for the combined Makwa-Mayville Project.

#### **METALLURGICAL TESTING AND MINERAL PROCESSING**

- It has been shown by way of metallurgical testing that the Makwa and Mayville mineralization is amenable to flotation concentration, and the concentration process flow sheet has potential to be taken to a further development stage.
- The samples that have been tested from the combined Makwa-Mayville Project show that the material is amenable to concentration for the nickel, copper, cobalt, palladium, platinum by flotation concentration.
- The dominant metal from the Makwa property is nickel, and the dominant metal from the Mayville property is copper.
- It appears from testwork completed to date that the Makwa mineralized material can be concentrated into a nickel-copper concentrate, and mineralized material from the Mayville Property can be concentrated into two separate concentrates, one copper and one nickel.
- The concentrator will be located at the Mayville Property. Mineralized material from Makwa will be hauled 43 km to the concentrator.
- It is anticipated that concentrates will be trucked to Molson, Manitoba and then railed to a nickel smelter near Sudbury, Ontario.

#### **ENVIRONMENTAL ASPECTS AND PERMITTING**

- The Project is subject to the Province of Manitoba and Federal Canadian permitting requirements and environmental regulations.

- Preliminary baseline studies indicate that there are no endangered species in the vicinity of the Project.

**ECONOMIC ANALYSIS**

- The total capital cost for the Project is estimated to be \$300.7 million, including \$208.8 million in pre-production and \$91.9 million in sustaining capital.
- In order to minimize the capital costs, and due to the moderate mine life, Mustang will excavate the open pits and process the Makwa mineralized material, followed by the Mayville mineralized material.
- The total unit operating cost is \$18.5/t milled for Makwa and \$12.9/t milled for Mayville, including grade control, stockpile re-handling and G&A costs.
- The base case economic analysis indicates that the Project has a positive cash flow. The after-tax NPV at 7.5% discount rate is approximately US\$97.4 million, with an IRR of 16%.

**RECOMMENDATIONS**

RPA recommends that Mustang continue to evaluate the technical and economic viability of the combined Makwa-Mayville Project by means of a Pre-feasibility Study (PFS). Many of the parameters and inputs listed in the May 2008 Makwa PFS can be used as a basis for the combined PFS.

To advance the Project to the PFS level, additional drilling, environmental baseline studies, geotechnical drilling and studies, and metallurgical test work are recommended with a total budget of C\$3.8 million (Table 1-4).

**TABLE 1-4 PROPOSED BUDGET  
Mustang Minerals – Mayville Property**

Item	Cost (C\$)
Infill drilling (3,000 m at \$150/m)	450,000
Exploration drilling (10,000 m at \$150/m)	1,500,000
Geotechnical Drilling and Studies	500,000
Metallurgical Test Work	200,000
Pre-feasibility Study	550,000
Mayville Topographical Site Survey	75,000
Operating costs/office	150,000
<b>Sub-total</b>	<b>3,425,000</b>
Contingency (10%)	343,000
<b>Total</b>	<b>3,768,000</b>



RPA recommends that Mustang continue trade-off studies to determine potential economic benefits for the combined Makwa-Mayville operation, such as:

- mine and processing production rates,
- owner operation and contract mining, and
- total repair and maintenance contract for a vendor-maintained mining equipment fleet.

The potential for crushing and selling the Makwa and/or Mayville pit waste rock for building and construction aggregates should be assessed.

The recommendations for specific areas of work follow.

### **GEOLOGY AND MINERAL RESOURCES**

#### Makwa

- The existing geology and drill hole database for the entire property should be converted to the metric and the NAD83 grid systems so as to be compatible with the database used to prepare the Makwa Mineral Resource estimate.
- Additional exploration is warranted in order to assess the potential for mineralized areas on the property that are outside the present open pit, including the host stratigraphy below the pit shell, and the Dumbarton mine area. Defining a resource and reserve for the Dumbarton area will improve the Project's economics.
- A detailed study which examines the potential impact of the blank samples containing elevated metal values should be undertaken. Such a study would review the position of these out-of-bounds blank samples within the database relative to the mineralized intervals. Re-assaying of all samples contained within the batch associated with these out-of-bounds samples is warranted for all samples contained within the mineralized domain models.
- The individual failures should be examined initially to ensure that they are not a result of transcription or other such errors at the data entry stage. A program of re-assaying of all samples relating to the failed batches is recommended.
- Core recovery and rock quality designation measurements should be recorded as a matter of routine, including core angle data, faults, and other features. Further assessment should be made of the specific gravity of mineralized rock and waste rock.

#### Mayville

- RPA recommends a drill program of 13,000 m for infill drilling and to explore along strike from the M2 Deposit. A key drill hole target is located 200 m east of the resource area where previous drilling intersected 18.53 m at an average grade of 0.56% Cu and 0.16% Ni at a vertical depth of approximately 120 m.

### **MINING**

- Commence basic engineering, including:

- Developing detailed mine plans and schedules;
  - Developing detailed dewatering programs for the Makwa and Mayville open pits;
  - Evaluating the economics of contractor versus owner mining.
- Conduct a detailed trade-off study to determine the optimal selective mining unit required to address mining selectivity, mineralized material loss, and dilution associated with the loader/truck combination.
  - Carry out a geotechnical study to determine the safest and steepest pit slopes for both the Makwa and Mayville pits. Additional geotechnical investigations should be undertaken to delineate and characterize soils containing any discontinuities for the final and interim waste dump and tailings dam slopes.
  - Complete a hydrogeology study in order to provide the open pit dewatering parameters. Consideration should be given to the establishment of the overburden dewatering parameters which will be needed for the design of surface diversions and drainage systems.
  - Determine the suitability and the particle size distribution of the country rocks from the open pit area for use as rock drain material for the tailings dam construction.

#### **MINERAL PROCESSING/INFRASTRUCTURE**

- Carry out metallurgical test work to:
  - Develop a flowsheet for Makwa and Mayville mineralization.
  - Test grind and regrind requirements (i.e., Bond Work Index, etc.).
  - Confirm grades and recoveries for Makwa and Mayville.
  - Test variability across mineralized zones for both the Makwa and Mayville deposits.
  - Investigate the mineralized material for the presence of material, which could cause sliming during the flotation process.
  - Test the proposed flow sheet through a pilot plant.
- Carry out subsurface investigations and evaluate sources of borrow material for dam construction, roads, and other project areas.
- Update the dam/dike design and carry out stability analyses to the PFS level.
- Carry out geochemistry analysis to the PFS stage, and determine if there is any requirement for an effluent treatment facility.
- Design and estimate to a PFS level the power, roads, and support infrastructure for the operation.

#### **ENVIRONMENTAL ASPECTS AND PERMITTING**

- Prepare a detailed water balance to assist in optimizing the design of the water treatment facilities.
- Carry out long-term geochemical characterization of mineralized material and mine wastes.

- Since the proposed Makwa waste dump locations are in the vicinity of a provincial park, the maximum dump height has been restricted such that the dumps are not visible from the Bird River and from nearby highways. Therefore, the maximum permissible dump height should be determined through a line of sight study. Upon the completion of this study a geotechnical study should be completed on the waste dumps to assess any potential stability issues with the design.
- Continue testing of the acid generating potential of the waste rock so that sequencing of the waste placement and remedial measures to mitigate any potential problems can be assessed and costs estimated. Preliminary results indicated that the waste rock will not be acid-generating. Testing of tailings should also be continued in order to assess the necessity for treatment and for closure planning.
- Model dilution of the tailings dam solution during the closure period, and the corresponding decline in the concentration of metals and compounds in the water tailings facility during and after the closure period.
- Continue the public engagement program with neighboring communities, including First Nations.

#### ***ECONOMIC ANALYSIS***

- Obtain detailed quotes for all equipment, supplies, and permanent infrastructure.
- Obtain quotes for the mineralized material hauling contractor unit costs (\$/tonne) from the Makwa property to the Mayville concentrator facility (approximately 43 km), concentrate hauling unit costs from the Mayville concentrator to the Molson, Manitoba rail siding, and contractor equipment/operator hourly rates for special construction projects.
- Prepare detailed estimates for all mining, processing, and G&A operating costs.
- Carry out additional studies to investigate other options to improve the accuracy of capital and operating cost estimates, to optimize the mining schedule, and to investigate alternative crushing processes such as high pressure grinding rolls or vibration cone crushers which have the potential to improve the Project economics.

#### ***IMPLEMENTATION PLAN/PROJECT DEVELOPMENT BUDGET***

- Develop a Project schedule with a Critical Path identified.

## **TECHNICAL SUMMARY**

### **PROPERTY DESCRIPTION AND LOCATION**

The Makwa Property is located 140 km northeast of Winnipeg, Manitoba at approximately 50°28'10"N latitude and 95°26'27"W longitude. The property consists of one mineral lease (ML-331), one surface lease (No. 297), and 28 unpatented mineral claims, totalling 4,108 ha. Part of the Makwa Property is situated in Nopiming Provincial Park, in an area zoned as "Resource Management", which is a multiple-use category that allows for commercial resource development and/or mineral extraction.

The Mayville Property is located 130 km northeast of Winnipeg, Manitoba, at approximately 50° 35' to 50° 39' N latitude and 95° 40' to 95° 30' W longitude. The Property consists of 75 mineral claims covering an area of 8,110 ha. Makwa and Mayville are separated by a distance of approximately 43 km (via roads).

### **LAND TENURE**

The Makwa Property consists of one mineral lease (ML-331), one surface lease (No. 297), and 28 unpatented mineral claims, totalling 4,108 ha. Mineral Lease ML-331 is a renewable 21-year lease covering 499 ha. Surface Lease No. 297 covers the same area as Mining Lease ML-331. The Makwa Property is subject to an existing 1% net smelter return (NSR) royalty agreement which may be reduced to 0.5% by a payment of C\$500,000 to Global Nickel Inc.

The Mayville Property is composed of 75 unpatented mineral claims, within the area where the M2 Deposit and current Mineral Resource are located. Fifty-four of these claims were purchased in the option agreement with Exploratus Elementis Diversis Ltd. (Exploratus). Fourteen claims were staked by Mustang and are 100% owned by Mustang. An additional seven claims that were formerly under option to Mustang from Tantalum Mining Corporation (Tantalum) are now 100% owned by Mustang.

### **EXISTING INFRASTRUCTURE**

The only existing infrastructure on the Mayville Property is an access road, which will need to be upgraded to accommodate heavy truck traffic. The Makwa Property contains the following infrastructure:

- Three-phase power is supplied by a Manitoba Hydro line, including 7.2 kVA to ground and 12.24 kVA.
- All-weather provincial access road; and
- Core storage building.

## **HISTORY**

### **MAKWA**

The Makwa Property was partially mined from two separate deposits located on the property by Maskwa Nickel Chrome Mines Limited (MNCM), controlled by Falconbridge Nickel Mines Limited (Falconbridge). The Dumbarton mine and F-Zone were mined from 1969 to 1974, and the Maskwa Mine was mined from 1974 to 1976. Open pit mining operations ceased due to low nickel prices.

In 1996, Canmine Resources Corporation (Canmine) acquired the property from MNCM and carried out environmental studies, geophysical surveys, and drilling, and estimated the Makwa (then Maskwa) deposit resource. A scoping study on concentrate treatment was completed in 1999. Surface and mining leases were granted in 1999.

Mustang acquired a 100% interest in the Maskwa Property on May 19, 2004, and changed the name of the deposit to Makwa in 2010.

### **MAYVILLE**

The first claims at Mayville were staked in 1917 to cover a copper-nickel showing. Several companies explored the property between 1917 and 1951. In 1951, the property was acquired by Falconbridge (MNCM), along with the Makwa Property. From 1956 through to 1990, Falconbridge carried out geophysical campaigns and drilling.

In 1995, Exploratus purchased a 60% interest in the Makwa-Mayville properties. Exploratus targeted chromite mineralization and conducted vertical gradient and magnetic surveying, and drilled eight holes totalling 2,742 ft. In 2005, Mustang purchased Exploratus' 60% interest in the property and 72.6% of MNCM which at that time owned the remaining 40% of the Property.

There has been no past production or historical mineral resource estimates made on the Mayville Property prior to those initiated by Mustang in 2006 and 2010.

## **GEOLOGY AND MINERALIZATION**

The Makwa and Mayville properties are located in the east-west trending Archean Bird River greenstone belt (BRGB) at the western edge of the exposed Superior Province of the Canadian Shield in southeastern Manitoba. The BRGB has a tectonic location between two continental cratonic blocks – the English River and the Winnipeg sub provinces, which are subprovinces of the Western Superior Province of the Canadian Precambrian Shield., The unconformable contact with Paleozoic sediments of the Interior Platform is located 65 km to the west.

The BRGB consists of bimodal assemblages of metavolcanic rocks and platform-type metasedimentary rocks that have undergone various stages of deformation, greenschist to amphibolite facies metamorphism, and are locally intruded by differentiated felsic to ultramafic rocks. The belt is bound by granites and gneisses, which together form a typical assemblage of the Superior Province.

The Bird River belt can be described as two sub-belts, which converge near Tulabi Lake. The two branches are separated by the quartz dioritic - granodioritic intrusion known as the Makwa Lake Batholith. Other parts of the BRGB are bound by felsic to intermediate gneissic rocks and other intrusive rocks of the Bird River Domain.

The east-west trending southern branch of the BRGB ranges in thickness from three to ten kilometres. It is dominated by pillowed and massive mafic to felsic metavolcanic rocks, clastic metasediments, and metaconglomerates of the Rice Lake Group. The layered mafic-ultramafic Bird River Sill (BRS; 2,470 Ma) intrudes this southern branch and hosts Ni-Cu-sulphide deposits, stratiform chromite, and PGE occurrences. The Makwa deposit is hosted in peridotite along the basal contact of the BRS. It is located in an area where the ultramafic rocks abruptly change contact relationships from concordant to discordant; the gabbro and ultramafic rocks discordant to stratigraphy may represent a root or feeder zone to the BRS.

A northern branch of the BRGB converges to the southern branch near Tulabi Lake. This 40 km long belt varies from less than one to four kilometres thick, and hosts the Mayville Intrusion, a Neoproterozoic layered mafic ultramafic intrusive, which in turn hosts the nickel-copper mineralization and Mineral Resources at the Mayville property. Supracrustal rocks of the northern splay face north and are composed mainly of pillowed and flow-textured volcanic rocks. The Mayville Intrusion is divided into upper and lower zones. The 700 m to

800 m thick upper zone consists of leucogabbroic and anorthositic rocks displaying a variety of textures including massive, poikilitic (irregular scattered inclusion minerals), and megacrystic leucogabbro. The 200 m to 300 m thick lower zone consists of a heterolithic breccia and is host to the M2 Deposit mineralization.

The mineralization at both Makwa and Mayville is a typical magmatic sulphide assemblage of pyrrhotite-pentlandite-chalcopyrite, with textures ranging from finely disseminated to semi-massive net-textured to inclusion-bearing massive sulphide. There are three other styles of mineralization the properties, including sulphide iron formation nickel-copper mineralization, sulphide iron formation copper mineralization, and chromite mineralization.

## **EXPLORATION STATUS**

Since the acquisition of the Makwa and Mayville properties, Mustang has completed a number of geophysical surveys.

At Makwa, a helicopter-borne VTEM geophysical survey conducted in 2007 outlined a number of significant electromagnetic anomalies. Time Domain Induced Polarization and magnetic survey were carried out in 2008-2009 over part of the property along the BRS. The survey outlined several high priority targets warranting drill investigation. Since 2004, Mustang has completed approximately 154 drill holes for a total of 30,625 m at Makwa.

The Mayville M2 Deposit was identified by drill-testing exploration targets identified by a VTEM survey. Following the discovery of PGE mineralization on the property in 2011, Mustang established a picket grid over the PGE zone and M2 Deposit and surveyed the grid lines with IP-mag and EM. The surveys were followed up with approximately 12,600 m of diamond drilling in 60 holes to evaluate the PGE and nickel-copper potential of the PGE zone and M2 Deposit. Since 2005, Mustang has completed a total of 148 drill holes for approximately 35,500 m at Mayville.

## **MINERAL RESOURCES**

Canadian Institute of Mining, Metallurgy and Petroleum Definition Standards (CIM definitions) for Mineral Resources and Mineral Reserves adopted by the CIM Council on November 27, 2010 were used in preparation of Mineral Resource estimates. The Makwa and Mayville Mineral Resources are effective as at November 27, 2013.

### MAKWA

RPA prepared the Mineral Resource estimate for the Makwa Deposit using drill hole data available as of October 14, 2009 (Table 1-5). A total of 256 drill holes were included in the database for Mineral Resource estimation. Mustang completed a total of ten additional drill holes (total 1,842.5 m) in 2010 subsequent to the preparation of the Mineral Resource estimate to supply additional sample material for metallurgical testing. RPA reviewed results from the new drilling in section and level plan and confirmed that those data would have only a minor impact on the local grade estimate and that overall the block model is still valid and current. A cut-off NSR value of greater than \$20.64/tonne was used for the current Mineral Resource estimate. The Mineral Resource estimate was constrained by a preliminary pit shell (with no roads).

**TABLE 1-5 MAKWA MINERAL RESOURCE SUMMARY – NOVEMBER 27, 2013**  
**Mustang Minerals Corp. – Makwa-Mayville Project**

Category	Zone	Tonnes	Ni (%)	Cu (%)	Pd (g/t)	Pt (g/t)	Co (%)
Indicated	Sulphide (402)	2,290,000	1.10	0.19	0.65	0.18	0.02
Indicated	Disseminated (407)	4,900,000	0.38	0.10	0.23	0.07	0.01
<b>Total Indicated</b>		<b>7,200,000</b>	<b>0.61</b>	<b>0.13</b>	<b>0.36</b>	<b>0.10</b>	<b>0.01</b>
Inferred	Hangingwall (403)	673,000	0.27	0.08	0.14	0.05	0.02

Notes:

1. CIM definitions have been followed for classification of Mineral Resources.
2. Sums may not add due to rounding.
3. Mineral Resources are reported using a \$20.64 NSR cut-off.
4. The Mineral Resources are estimated using metal prices of US\$3.40/lb Cu and US\$8.50/lb Ni, estimated recoveries and smelter terms, and a US\$/C\$ exchange rate of 0.97.
5. The NSR factors used are: 87.33 per % Ni, 29.65 per % Cu, 38.25 per % Co, 0.14 per g/t Pt and 0.08 per g/t Pd.

### MAYVILLE

RPA prepared the Mineral Resource estimate for the Mayville M2 Deposit using drill hole data available as of November 27, 2013 (Table 1-6). A total of 120 holes for approximately 27,400 m located at or in the vicinity of the M2 Deposit were included in the database for Mineral Resource estimation. The Mineral Resource estimate was constrained by a preliminary pit shell (with no roads).



**TABLE 1-6 MAYVILLE MINERAL RESOURCE SUMMARY – NOVEMBER 27, 2013**  
**Mustang Minerals Corp. – Makwa-Mayville Property**

Category	Tonnage	Ni	Cu	Au	Pt	Pd	Eq Cu	Ni	Cu	Au	Pt	Pd
	(M t)	(%)	(%)	(g/t)	(g/t)	(g/t)	(%)	(M lb)	(M lb)	(k oz)	(k oz)	(k oz)
Indicated	26.6	0.18	0.44	0.05	0.05	0.14	0.58	105.5	255.8	42	42	119
Inferred	5.2	0.19	0.48	0.04	0.06	0.15	0.63	21.0	54.7	7	10	25

Notes:

1. CIM definitions have been followed for classification of Mineral Resources.
2. Mineral Resources are reported at an NSR cut-off value of C\$15/tonne.
3. NSR values are calculated in C\$ using factors of \$51 per % Cu and \$41 per % Ni. These factors are based on metal prices of US\$3.40/lb Cu and US\$8.50/lb Ni, estimated recoveries and smelter terms, and a US\$/C\$ exchange rate of 0.97.
4. A minimum mining width of two metres was used.
5. Totals may not add correctly due to rounding.

## MINERAL RESERVES

There are no current Mineral Reserves on the Project.

## MINING METHOD

The PEA is based on open pit mining with production from a single pit at the Makwa Property, followed by a single open pit at the Mayville Property. Pit benches will be five metres high for Makwa and ten metres high for Mayville. The mineralized material and waste rock will be drilled and blasted, loaded with front end loaders, and hauled to either a crusher or waste rock pile. Haulage distances from the open pit to the crusher area will vary. The Makwa ROM will be trucked approximately 43 km to the Mayville concentrator facility. Mayville ROM will be hauled approximately one kilometre to the concentrator. Mining will be carried out by Mustang personnel.

It is estimated that the mine will operate on a general production schedule of 24 hours per day, seven days per week. Production blasts are scheduled to occur five to six days per week. Mine life is four years for Makwa and eight years for Mayville, and the mining rate will average approximately 20.5 million tonnes per year of mineralized material and waste mined.

Table 1-7 summarizes the open pit dimensions.

**TABLE 1-7 PIT DESIGN PARAMETERS AND DIMENSIONS SUMMARY**  
**West Kirkland Mining Inc. – TUG Project**

<b>Pit Dimensions</b>	<b>Makwa</b>	<b>Mayville</b>
Pit Length (m)	1,000	1,500
Pit Width (m)	520	500
Surface Area (m <sup>2</sup> )	322,000	634,000
Maximum Pit Depth (m)	206	330.0
Pit Bottom Elevation (masl)	90.1	-30.0
Pit Exit Elevation (masl)	294.0	290.0
Average Ramp Grade (%)	10	10
Ramp Width double-lane (m)	27	27
Ramp Width single-lane (m)	20	20
Overall Highwall Slope (°)	42 north / 49 south	49
Mining Bench Height (m)	5	10
3D Model Block Size (m)	10 m x 5 m x 5 m	10 m x 10 m x 10 m
Type Benching (berming)	Double benching	Single benching

## **MINERAL PROCESSING**

Based on metallurgical testwork and the prospect of mining Makwa followed by Mayville, the Makwa Mayville concentrator is designed to process both types of mineralized material in sequence. The concentrator location is proposed to be at the Mayville site, with associated tailings management facilities (TMF) located there. Mineralized material will be trucked from Makwa to the Mayville concentrator.

The proposed design throughput is 8,600 tpd based on 96% availability. This equates to three million tonnes of mineralized material per calendar year throughput. Makwa mineralized material will produce a single concentrate comprising mainly nickel (10% Ni) containing also copper, gold, and platinum group metals. Mayville mineralized material will produce two concentrates, nickel and copper.

The concentrator will consist of conventional multistage crushing followed by two-stage grinding in closed circuit with hydrocyclones. Cyclone product will go to a rougher/scavenger flotation circuit. The rougher concentrate will be sent to a cleaner flotation circuit. The resulting final concentrate will be thickened, filtered and dried, and stored in a concentrate storage area. The concentrate will be loaded onto trucks and shipped to the nearest railhead for transfer to railcars and shipment to a smelter.

The tails from the rougher/scavenger, cleaner circuit, and the scavenger cleaner circuit will be combined, sent to a tailings thickener, in order to reclaim process water. The thickener underflow will be pumped to the TMF. Reclaimed process water will be returned to the head of the grinding circuit for re-use. Water from the TMF will also be returned to the concentrator for re-use.

## PROJECT INFRASTRUCTURE

The infrastructure proposed at Makwa will mainly include access and site roads; mine office, shops, and warehouses; power, water, and storage facilities. The infrastructure at Mayville will include access and site roads, power, water, processing plant with associated TMF, office complex and laboratory, warehouses, storage facilities, substation, communications facilities, etc.

## MARKET STUDIES

Potential customers for a combined nickel and copper concentrate include all global nickel smelters; however, due to competitive, transportation, and business constraints the most likely customers of Mustang nickel and copper concentrates are summarized in Table 1-8.

**TABLE 1-8 POTENTIAL SMELTERS CUSTOMERS**  
**Mustang Minerals Corp. – Makwa-Mayville Project**

Smelter Name	Company	Location	Products	Estimated Distance From Winnipeg Concentrator (km)
Horne	Xstrata plc	Rouyn-Noranda, QC	Cu	1,648
Sudbury Division	Xstrata plc	Falconbridge, ON	Ni, Cu	1,519
Copper Cliff	Vale Inco Ltd	Sudbury, ON	Cu, Ni, Co	1,519

## ENVIRONMENTAL, PERMITTING AND SOCIAL CONSIDERATIONS

It has been estimated that the time frame to complete the necessary environmental assessments and permits for the Mayville and Makwa sites should take approximately two years.

Environmental baseline studies have been started for the Makwa Project (mine only), and an environmental scoping study has been completed for the Mayville Project (mine, processing facility, and TMF).

The Mayville-Makwa Project is located on two, separate areas of Crown Land in east central Manitoba. Because the Project is located on Crown Land, both the Federal and Provincial governments will be involved in permitting and regulating the Project; however, many of the programs are administered at the provincial level. The Project components that will impact on the applicable regulations are:

- Open pit mining and minerals processing by flotation concentration that will occur on Crown land.
- Access to the property is gained via an established public roadway.
- Water for the Project will be derived from on-site wells.
- Project construction does not require dredge or fill activities in Waters of Canada.
- Power for the Project will be generated off-site, and delivered via overhead distribution lines in an existing public roadway.

## CAPITAL AND OPERATING COST ESTIMATES

Capital costs for the Project are summarized in Table 1-9.

**TABLE 1-9 SUMMARY OF PROJECT CAPITAL COSTS**  
**Mustang Minerals Corp. – Makwa-Mayville Project**

<b>Capital Category</b>	<b>Pre-production (C\$000)</b>	<b>Sustaining (C\$000)</b>	<b>Total (C\$000)</b>
<b>Direct Capital Cost</b>			
Pre-stripping - Makwa	24,320	-	24,320
Pre-stripping - Mayville	-	-	-
Mine Equipment - Makwa	50,449	-	50,449
Mine Equipment - Mayville	-	-	-
Plant - Mayville	63,037	1,113	64,150
Infrastructure - Mayville	11,722	-	11,722
Infrastructure - Makwa	1,208	-	1,208
Tailings and Water Management	6,339	-	6,339
<b>Direct Subtotal</b>	<b>157,074</b>	<b>1,113</b>	<b>158,187</b>
<b>Indirects</b>			
EPCM and Owner's Cost	24,807	445	25,252
Directs + Indirects	181,880	1,558	183,439
Contingency on Plant, Infrastructure, and Tailings	24,903	440	25,343
<b>Sub-Total Capital Cost</b>	<b>206,783</b>	<b>1,998</b>	<b>208,781</b>

<b>Capital Category</b>	<b>Pre-production (C\$000)</b>	<b>Sustaining (C\$000)</b>	<b>Total (C\$000)</b>
Sustaining Plant		17,320	17,320
Sustaining Infrastructure		2,105	2,105
Sustaining Tailings		12,062	12,062
Sustaining Mine		48,772	48,772
Salvage		-	-
Reclamation and Closure		11,722	11,722
<b>Total Capital Cost</b>	<b>206,783</b>	<b>93,905</b>	<b>300,688</b>

A summary of the Project's operating cost is shown in Table 1-10.

**TABLE 1-10 SUMMARY OF PROJECT OPERATING COSTS**  
**Mustang Minerals Corp. – Makwa-Mayville Project**

<b>Operating Costs</b>	<b>Units</b>	<b>Makwa</b>	<b>Mayville</b>
Mining (Open Pit)	\$/t mined	1.88	2.04
Stock Pile Rehandling	\$/t milled	0.06	0.06
Processing	\$/t milled	10.50	10.50
Grade Control	\$/t milled	0.05	0.05
Other Power & Heat	\$/t milled	0.22	0.22
Makwa Mineralized Material Transport	\$/t milled	5.64	-
G&A	\$/t milled	2.03	2.03
<b>Total Unit Op. Cost - Excluding Mining</b>	<b>\$/t milled</b>	<b>18.49</b>	<b>12.85</b>

## 2 INTRODUCTION

Roscoe Postle Associates Inc. (RPA) was retained by Mustang Minerals Corp. (Mustang) to prepare an independent Technical Report on the Preliminary Economic Assessment (PEA) of combined production from the Makwa and Mayville Properties (the Project), near Lac du Bonnet, Manitoba. The purpose of this Technical Report is to update the resources at both the Makwa and Mayville deposits with updated cut-off grade input parameters and pit-shells, and evaluate the potential to jointly operate mines at both deposits feeding a central processing facility to a PEA level. This Technical Report conforms to NI 43-101 Standards of Disclosure for Mineral Projects.

Mustang is listed on the Toronto Stock Venture Exchange and the Frankfurt Stock Exchange and is focused on exploration and development of nickel, copper, and platinum group element (PGE) deposits. Mustang has an 89.04% interest in the group of claims which includes the M2 Deposit and a 100% interest in the other claims at the Mayville Property. Mustang also has a 100% (subject to a Net Smelter Return royalty) interest in the Makwa Nickel Property which hosts the Makwa Nickel Deposit located 43 km to the south of the Mayville Property. The Project consists of two properties, Makwa and Mayville. In total, there are 103 mineral claims, one mineral lease, and one surface lease.

Some historical reports refer to the Makwa Property as the Maskwa Property. The property was renamed Makwa in 2010 and this name is used throughout this report.

This report is considered by RPA to meet the requirements of a PEA as defined in Canadian NI 43-101 regulations. The economic analysis contained in this report is based, in part, on Inferred Resources, and is preliminary in nature. Inferred Resources are considered too geologically speculative to have mining and economic considerations applied to them and to be categorized as Mineral Reserves. There is no certainty that economic forecasts on which this PEA is based will be realized.

### SOURCES OF INFORMATION

RPA Principal Mining Engineers Stuart Collins, P.E., and Hugo Miranda, P.E., visited the Makwa and Mayville Properties on September 17, 2013. RPA Principal Geologist David Ross, P.Geo., most recently visited the Mayville Property and the drill core handling and

storage facility on December 18 and 19, 2012. RPA Principal Geologist Reno Pressacco, P.Geo., visited the Makwa property from September 16 to 19 2008. Technical documents and reports on the Property were reviewed at the site and additional information was obtained from the Mustang exploration office located in Pinawa, Manitoba. Discussions were held with technical personnel as follows:

- Mr. Robin Dunbar, President, CEO and Director of Mustang; and
- Mr. Carey Galeschuck, P.Geo., Vice President Exploration, Mustang.

This Technical Report was completed by Messrs. Ross, Pressacco, Miranda, Collins, and Holger Krutzelmann, P.Eng., RPA Principal Metallurgist, all Qualified Persons (QP) in accordance with the requirements of NI 43-101.

Mr. Ross is responsible for the Mayville Mineral Resource estimate and Mr. Pressacco is responsible for the Makwa Mineral Resource estimate described in this Technical Report. Mr. Miranda is responsible for the mining aspects of this Technical Report. Mr. Krutzelmann prepared the sections on metallurgical testing and mineral processing. Mr. Collins is responsible for the economic analysis of the combined Makwa and Mayville operation.

The documentation reviewed, and other sources of information, are listed at the end of this report in Section 27 References.

## LIST OF ABBREVIATIONS

Units of measurement used in this report conform to the metric system. All currency in this report is Canadian dollars (C\$) unless otherwise noted.

a	annum	kWh	kilowatt-hour
A	ampere	L	litre
bbl	barrels	lb	pound
btu	British thermal units	L/s	litres per second
°C	degree Celsius	m	metre
C\$	Canadian dollars	M	mega (million); molar
cal	calorie	m <sup>2</sup>	square metre
cfm	cubic feet per minute	m <sup>3</sup>	cubic metre
cm	centimetre	μ	micron
cm <sup>2</sup>	square centimetre	MASL	metres above sea level
d	day	μg	microgram
dia	diameter	m <sup>3</sup> /h	cubic metres per hour
dmt	dry metric tonne	mi	mile
dwt	dead-weight ton	min	minute
°F	degree Fahrenheit	μm	micrometre
FASL	feet above sea level	mm	millimetre
ft	foot	mph	miles per hour
ft <sup>2</sup>	square foot	MVA	megavolt-amperes
ft <sup>3</sup>	cubic foot	MW	megawatt
ft/s	foot per second	MWh	megawatt-hour
g	gram	oz	Troy ounce (31.1035g)
G	giga (billion)	oz/st, opt	ounce per short ton
Gal	Imperial gallon	ppb	part per billion
g/L	gram per litre	ppm	part per million
Gpm	Imperial gallons per minute	psia	pound per square inch absolute
g/t	gram per tonne	psig	pound per square inch gauge
gr/ft <sup>3</sup>	grain per cubic foot	RL	relative elevation
gr/m <sup>3</sup>	grain per cubic metre	s	second
ha	hectare	st	short ton
hp	horsepower	stpa	short ton per year
hr	hour	stpd	short ton per day
Hz	hertz	t	metric tonne
in.	inch	tpa	metric tonne per year
in <sup>2</sup>	square inch	tpd	metric tonne per day
J	joule	US\$	United States dollar
k	kilo (thousand)	USg	United States gallon
kcal	kilocalorie	USgpm	US gallon per minute
kg	kilogram	V	volt
km	kilometre	W	watt
km <sup>2</sup>	square kilometre	wmt	wet metric tonne
km/h	kilometre per hour	wt%	weight percent
kPa	kilopascal	yd <sup>3</sup>	cubic yard
kVA	kilovolt-amperes	yr	year
kW	kilowatt		



### 3 RELIANCE ON OTHER EXPERTS

This report has been prepared by Roscoe Postle Associates Inc. (RPA) for Mustang Minerals Corp. (Mustang). The information, conclusions, opinions, and estimates contained herein are based on:

- Information available to RPA at the time of preparation of this report,
- Assumptions, conditions, and qualifications as set forth in this report, and
- Data, reports, and other information supplied by Mustang and other third party sources.

For the purpose of this report, RPA has relied on ownership information provided by Mustang. RPA has not researched property title or mineral rights for the Mayville Property and expresses no opinion as to the ownership status of the property.

RPA has relied on the Client with respect to all taxation rates and rules associated with the Project, including, but not limited to, any associated municipal, provincial, state, and federal taxes, royalties and other production-based taxes, and other applicable laws that would allow for the modification of taxes applicable to the Project. The after-tax cash flow model contained in this report includes the application of the tax rates and rules provided by the client.

Except for the purposes legislated under provincial securities laws, any use of this report by any third party is at that party's sole risk.

## 4 PROPERTY DESCRIPTION AND LOCATION

The Project is located approximately 140 km northeast of Winnipeg, Manitoba, and consists of two properties, Makwa and Mayville. In total, there are 103 mineral claims, one mineral lease, and one surface lease. Figure 4-1 shows the location of the Makwa and Mayville copper-nickel properties. According to the Mines and Minerals Act of Manitoba (The Mine and Minerals Consequential Amendment Act, Part 7,108 enacted July 26, 1991), a mineral lease grants to the lease holder:

- The exclusive rights to the minerals, other than quarry minerals, that are the property of the Crown and are found in place on, in, or under the land covered by the lease.
- Mineral access rights that include:
  - The right to open and work a shaft or mine within the limits of the lease area; and
  - The right to erect buildings or structures upon the subject land for the purpose of exploration and/or mining.

According to the same act, the holder of a mineral claim is granted:

- The exclusive right to explore for and develop the Crown minerals other than quarry minerals, found in place on, in, or under the lands covered by the claim.
- Subject to certain Ministerial considerations, the holder of a mineral claim may enter, use, and occupy the surface of the land that is governed by the claim for the purpose of prospecting or exploring or developing, mining or producing minerals on, in, or under the land.

In Manitoba, unpatented mineral claims require annual exploration assessment expenditures of C\$12.50 per hectare per year on claims less than 10 years from the date of registration. The amount changes to C\$25.00 per hectare per year for any claims held past 10 years from the date of registration. Previous exploration work can be banked, grouped and applied as needed to meet assessment requirements. Unpatented mineral claims include access to the mining rights only. No outstanding obligations exist with regard to the claims under option.

Exploration work conducted on the Mustang mineral claims requires work permits from Manitoba Conservation. Work permits are submitted to Manitoba Conservation, which is responsible for granting the permits. Manitoba Innovation, Energy and Mines conducts consultation with the First Nations prior to the work permits being granted. To date, Mustang has received all work permits in a timely manner.

Mustang has a "Memorandum of Understanding" in place with the Sagkeeng First Nation. Other aboriginal groups may assert treaty or heritage rights to the area in the future.

RPA is not aware of any environmental liabilities associated with either the Makwa or Mayville properties.

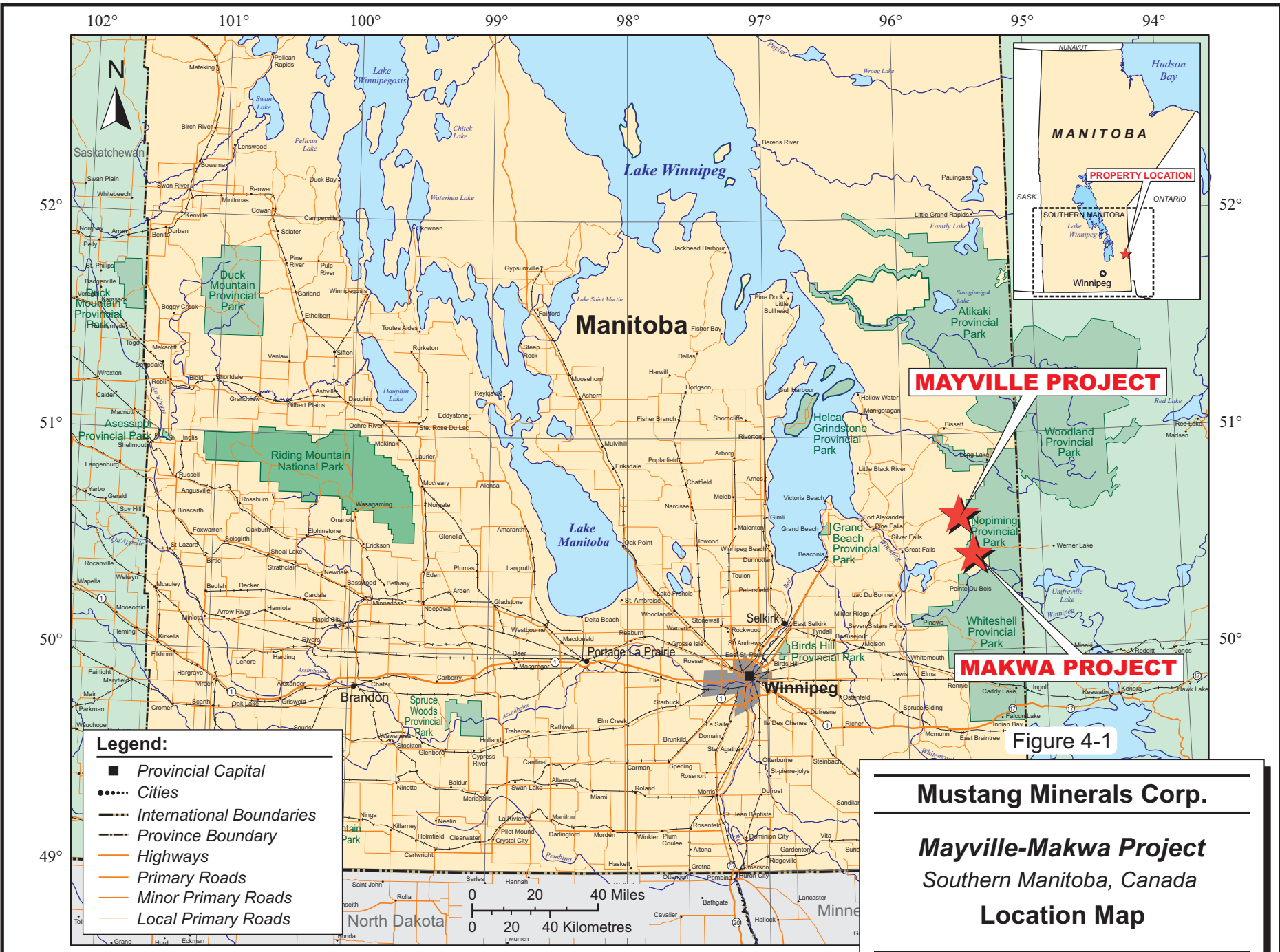
RPA is not aware of any other significant factors and risks that may affect access, title, or Mustang's right or ability to perform work on the property.

## **MAKWA**

The Makwa property is located on National Topographic System (NTS) map sheets 52L/5 and 52L/6 at latitude 50°28'10"N and longitude 95°26'27"W, Zone 15. The property consists of one mineral lease (ML-331), one surface lease (No. 297), and 28 unpatented mineral claims, totalling 4,108 ha. Part of the Makwa Property is situated in Nopiming Provincial Park, in an area zoned as "Resource Management", which is a multiple-use category that allows for commercial resource development and/or mineral extraction (Figure 4-2).

### **MINERAL LEASE ML-331**

Mineral Lease ML-331 is a renewable 21-year lease covering 499 ha. It was issued by the Province of Manitoba on June 26, 1998, commencing on June 17, 1998. The lease is set to expire on July 17, 2019. The lease annual fee is C\$4,256 (C\$8/ha) when mining and C\$6,384 (C\$12/ha) when production is not taking place (Evans, 2005). The lease has been surveyed.



**MAYVILLE PROJECT**

**MAKWA PROJECT**

Figure 4-1

**Mustang Minerals Corp.**

**Mayville-Makwa Project**  
Southern Manitoba, Canada

**Location Map**

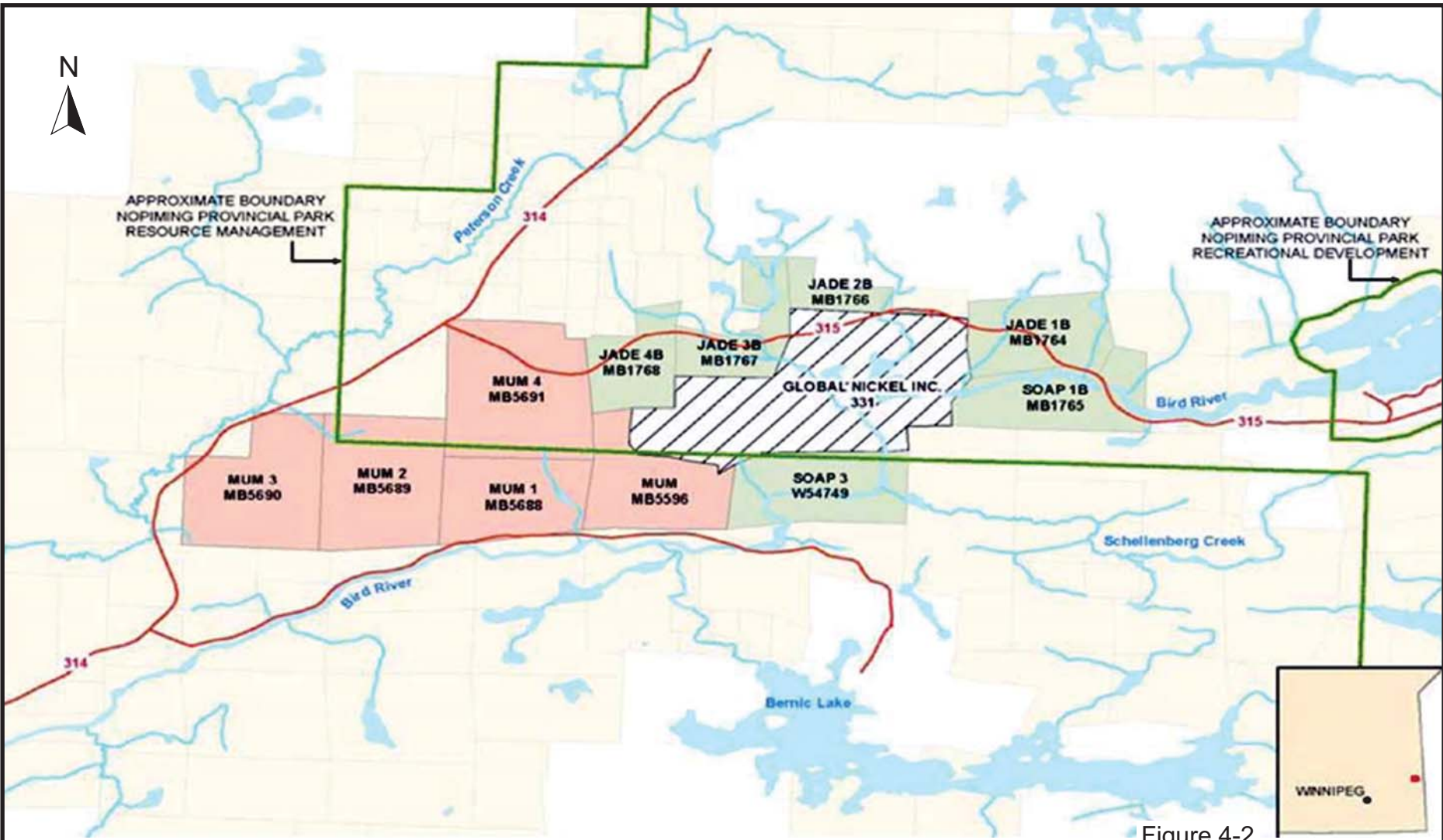
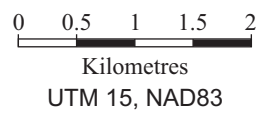


Figure 4-2

**Legend:**

	Global Nickel Inc. Mineral Claim
	Mustang Minerals Corp. Mineral Claim
	Global Nickel Inc. 331
	Other Mineral Claim



**Mustang Minerals Corp.**

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**Mayville-Makwa Project**  
Southern Manitoba, Canada

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**Makwa Land Ownership Map**

## SURFACE LEASE NO. 297

Surface Lease No. 297 covers the same area as Mining Lease ML-331. It was issued January 22, 1999 by the Province of Manitoba as a renewable 21-year lease commencing on May 1, 1999. The lease was designated for construction and operation of a nickel mine and mill facility and also allows construction and operation of a cobalt mill. The total annual lease fee is C\$3,109 (C\$5.84/ha) which includes land rental, service fees and federal goods and services tax.

## MINERAL CLAIMS

The 28 mineral claims encompass a total area of 3,609 ha and have varying expiration dates ranging from May 2014 to March 2017. The names of the claims, the claim holder, as well as their respective expiry dates, are presented in Table 4-1. All claims are owned either by Global Nickel Inc. (Global Nickel), of which Mustang owns 100%, or by Mustang itself. The surface rights of the mineral claims are owned by the Crown (Evans, 2005). The staked mineral claims have not been surveyed (Evans, 2005). The current annual cost to hold the claims is C\$29,365.50.

**TABLE 4-1 MAKWA PROPERTY MINERAL CLAIMS**  
**Mustang Minerals Corp. – Makwa-Mayville Project**

	<b>Claim Name</b>	<b>Claim Number</b>	<b>Claim Holder</b>	<b>Recording Date (d/m/y)</b>	<b>Expiry Date (d/m/y)</b>	<b>Area (ha)</b>
1	BAR 1	W51783	Global Nickel Inc.	19/03/1987	18/05/2014	100
2	BAR 3	W51785	Global Nickel Inc.	19/03/1987	18/05/2014	159
3	BAR 4	W51786	Global Nickel Inc.	19/03/1987	18/05/2014	61
4	BAR 5	W51787	Global Nickel Inc.	19/03/1987	18/05/2014	209
5	BAR 6	W51788	Global Nickel Inc.	19/03/1987	18/05/2014	96
6	BAR 7	W51930	Global Nickel Inc.	06/08/1987	05/10/2017	11
7	BAR 8	W51931	Global Nickel Inc.	06/08/1987	05/10/2014	23
8	BRUZ 3	MB3195	Global Nickel Inc.	30/05/2002	29/07/2015	80
9	JADE 1B	MB1764	Global Nickel Inc.	20/07/1992	18/09/2017	151
10	JADE 2B	MB1766	Global Nickel Inc.	20/07/1992	18/09/2017	43
11	JADE 3B	MB1767	Global Nickel Inc.	20/07/1992	18/09/2017	82
12	JADE 4B	MB1768	Global Nickel Inc.	20/07/1992	18/09/2017	112
13	MUM	MB5596	Mustang Minerals Corp	30/06/2004	29/08/2017	126
14	MUM 1	MB5688	Mustang Minerals Corp	17/09/2004	16/11/2017	160
15	MUM 2	MB5689	Mustang Minerals Corp	17/09/2004	16/11/2017	180
16	MUM 22	MB7902	Global Nickel Inc.	02/10/2007	01/12/2017	225
17	MUM 23	MB7903	Global Nickel Inc.	02/10/2007	01/12/2017	215
18	MUM 24	MB7904	Global Nickel Inc.	02/10/2007	01/12/2017	256

	<b>Claim Name</b>	<b>Claim Number</b>	<b>Claim Holder</b>	<b>Recording Date (d/m/y)</b>	<b>Expiry Date (d/m/y)</b>	<b>Area (ha)</b>
19	MUM 25	MB7905	Global Nickel Inc.	02/10/2007	01/12/2017	203
20	MUM 28	MB7949	Global Nickel Inc.	15/01/2008	16/03/2018	54
21	MUM 29	MB7944	Global Nickel Inc.	15/01/2008	16/03/2015	89
22	MUM 3	MB5690	Mustang Minerals Corp	17/09/2004	16/11/2017	192
23	MUM 30	MB7946	Global Nickel Inc.	15/01/2008	16/03/2015	94
24	MUM 31	MB7754	Global Nickel Inc.	15/01/2008	16/03/2015	96
25	MUM 33	MB8600	Global Nickel Inc.	19/08/2008	18/10/2015	11
26	MUM 4	MB5691	Mustang Minerals Corp	17/09/2004	16/11/2017	252
27	SOAP 1B	MB1765	Global Nickel Inc.	15/07/1996	13/09/2017	164
28	SOAP 3	W54749	Global Nickel Inc.	15/07/1996	13/09/2017	165
	<b>Total</b>					<b>3,609</b>

### **AGREEMENTS SUMMARY**

In 1996, Canmine Resources Corporation (Canmine) optioned the property, consisting of the four Jade claims, from Maskwa Nickel Chrome Mines Ltd. (MNCM), controlled by Falconbridge Ltd. (Falconbridge). The total acquisition cost was C\$1.9 million, and the claims were subject to a 3% net smelter return (NSR) to MNCM with a provision that Canmine could reduce the NSR to 2% by paying \$1 million to MNCM.

In 2002, Canmine initiated a restructuring of its financial obligations under the Companies' Creditors Arrangement Act (CCAA) and obtained a protection order under CCAA before the Ontario Superior Court of Justice (Evans, 2005). The Ontario Superior Court of Justice ordered Canmine to liquidate all of its assets for stakeholders after the protection order was lifted on February 26, 2003. The leases and claims were sold free of encumbrances, including royalties under the terms of the Court Order authorizing Purchase Agreement.

Canmine constructed a large steel building on a cement foundation next to the Dumbarton portal and purchased several pieces of mill equipment for pilot testing of cobalt-rich mineralized material (Evans, 2005). These items were later sold to a private individual.

In 2003, Global Nickel purchased 100% undivided interest in the mining lease and six claims (four JADE claims and two SOAP claims) subject to a 1% NSR to Commerce Capital Inc.

In June 2004, Mustang acquired a 100% interest in Global Nickel for \$500,000 and 6.679 million shares of Mustang (valued at C\$0.43/share) payable to the shareholders of Global Nickel. Through this, Mustang acquired the Makwa (then Maskwa) nickel property that

consisted of one renewable 21-year mineral lease, one surface lease, and six mineral claims covering 1,249 ha. The mining lease and six claims are subject to a 1% NSR, however, Mustang can reduce the NSR to 0.5% by paying C\$500,000 (Evans, 2005). Five of the MUM series claims in Table 4-1 are 100% owned by Mustang and are not subject to any royalties.

In November 2009, Mustang concluded a Memorandum of Understanding (MOU) with the Sagkeeng First Nation for exploration activities in the area. Maskwa was renamed Makwa to reflect the Ojibway pronunciation of the word "bear".

## **MAYVILLE**

The Mayville property is located 130 km northeast of Winnipeg, Manitoba, at approximately 50° 35' to 50° 39' N latitude and 95° 40' to 95° 30' W longitude (Figure 4-1), Zone 15. The western boundary of the Nopiming Provincial Park is several kilometres to the east. Mayville is located approximately seven kilometres from Maskwa Lake. Access to the site from Winnipeg is via Manitoba Provincial Highways 59, 44, 314 and the Trans-Licence Road. Trans-Licence Road is a Class I gravel road, which has a life of greater than 20 years.

The Mayville property is located on National Topographic Series (NTS) map sheet 52L-12 and consists of 75 unpatented mineral claims for an area of 8,110 ha (Figure 4-3). Fifty-four of these claims, within which the M2 Deposit and current Mineral Resource are located, were purchased in the option agreement with Exploratus Elementis Diversis Ltd. (Exploratus). Fourteen claims were staked by Mustang and are 100% owned by Mustang. An additional seven claims that were formerly under option to Mustang from Tantalum Mining Corporation (Tantalum) are now 100% owned by Mustang. Table 4-2 provides a complete list and brief description of the Mayville Property group of claims. Descriptions of each option agreement are also provided below.



**TABLE 4-2 MAYVILLE PROPERTY MINERAL CLAIMS**  
**Mustang Minerals Corp. – Makwa-Mayville Project**

	<b>Claim Name</b>	<b>Claim Number</b>	<b>Claim Holder</b>	<b>Recording Date (d/m/y)</b>	<b>Expiry Date (d/m/y)</b>	<b>Area (ha)</b>
1	ANGEL 1	W52801	MNCM	15/11/1993	14/01/2017	181
2	ANGEL 2	W52802	MNCM	15/11/1993	14/01/2016	63
3	ANNA	W53816	MNCM	27/01/1998	28/03/2017	64
4	ANNE	MB1665	MNCM	17/08/1998	16/10/2015	160
5	BOX	27482	MNCM	07/01/1919	08/03/2017	17
6	CANADA	27769	MNCM	25/07/1919	23/09/2015	21
7	CARMEN	MB6081	MNCM	29/06/2005	28/08/2015	256
8	CINA 1 F	MB1672	MNCM	09/03/1998	08/05/2017	2
9	CINA 2 F	MB1681	MNCM	09/03/1998	08/05/2017	2
10	COLOSSUS 16	W6202	MNCM	20/09/1935	19/11/2017	21
11	COLOSSUS 21	W6207	MNCM	20/09/1935	19/11/2015	23
12	COLOSSUS 22	W6208	MNCM	20/09/1935	19/11/2017	11
13	COLOSSUS 24	W6210	MNCM	20/09/1935	19/11/2017	15
14	COPPER BOTTOM	27764	MNCM	25/07/1919	23/09/2015	21
15	COPPER CONTACT	27767	MNCM	25/07/1919	23/09/2015	21
16	EILEEN 3	W53238	Mustang Minerals Corp	11/06/1982	10/08/2015	141
17	FRAN	MB1627	MNCM	22/12/1997	20/02/2017	72
18	GILROY	26686	MNCM	28/12/1917	26/02/2015	16
19	JUNKO	W53934	MNCM	27/01/1998	28/03/2017	77
20	MARGART	26785	MNCM	07/05/1918	06/07/2017	14
21	Mask 1	MB7164	Mustang Minerals Corp	30/03/2005	29/05/2015	25
22	MAY 11	MB3361	MNCM	07/01/2002	07/03/2015	64
23	MAY 12	MB3362	MNCM	07/01/2002	07/03/2015	52
24	MAY 13	MB3363	MNCM	07/01/2002	07/03/2015	73
25	MAY 2 FR	MB2088	MNCM	22/10/1999	21/12/2017	2
26	MAY 3	MB2090	MNCM	02/11/1999	01/01/2015	54
27	MAY 4	MB2089	MNCM	02/11/1999	01/01/2015	30
28	MAY 5	MB1975	MNCM	02/11/1999	01/01/2017	24
29	MAY 6 FR	MB1976	MNCM	03/12/1999	01/02/2017	7
30	MAY 7 FR	MB1977	MNCM	03/12/1999	01/02/2017	2
31	MAY 8	MB1978	MNCM	11/04/2001	10/06/2017	64
32	MAY FR	MB1640	MNCM	05/02/1999	06/04/2017	1
33	MAYFLY	MB9520	Mustang Minerals Corp	17/02/2010	17/04/2014	143
34	MAYFLY 1	MB9735	MNCM	07/06/2010	06/08/2015	128
35	MAYFLY 2	MB9736	MNCM	07/06/2010	06/08/2015	256
36	MAYFLY 3	MB9737	MNCM	07/06/2010	06/08/2015	192
37	MAYFLY 4	MB9738	Mustang Minerals Corp	07/06/2010	06/08/2014	100
38	MAYVILLE	26684	MNCM	28/12/1917	26/02/2015	21
39	MINNIE	27483	MNCM	07/01/1919	08/03/2017	16
40	MUM 10	MB5928	MNCM	04/05/2005	03/07/2015	256
41	MUM 11	MB5929	MNCM	04/05/2005	03/07/2015	240
42	MUM 12	MB5930	MNCM	04/05/2005	03/07/2015	240

Claim Name	Claim Number	Claim Holder	Recording Date (d/m/y)	Expiry Date (d/m/y)	Area (ha)
43	MUM 13	MNCM	04/05/2005	03/07/2015	240
44	MUM 14	MNCM	04/05/2005	03/07/2015	234
45	MUM 17	MNCM	17/06/2005	16/08/2015	256
46	MUM FR	MNCM	30/05/2005	29/07/2015	2
47	MUMCAT 2	MNCM	28/08/2007	27/10/2015	240
48	MUS 1	MNCM	08/04/2011	07/06/2017	70
49	MUS 2	MNCM	08/04/2011	07/06/2017	85
50	MUS 3	MNCM	08/04/2011	07/06/2017	256
51	MUS 4	MNCM	08/04/2011	07/06/2017	128
52	MUS 5	MNCM	08/04/2011	07/06/2017	256
53	MUS 6	MNCM	08/04/2011	07/06/2017	256
54	RAY 1	MNCM	03/01/1996	04/03/2017	128
55	RAY 2	MNCM	03/01/1996	04/03/2017	256
56	RAY 3	MNCM	03/01/1996	04/03/2017	256
57	RAY 4	MNCM	03/01/1996	04/03/2017	241
58	RAY 5	MNCM	03/01/1996	03/03/2015	256
59	RAY 6	MNCM	03/01/1996	03/03/2015	256
60	RED CLOUD #6	MNCM	10/08/1936	09/10/2017	24
61	RED CLOUD #7	MNCM	10/08/1936	09/10/2017	17
62	RED CLOUD 5	MNCM	10/08/1936	09/10/2017	6
63	RED CLOUD NO 4	MNCM	10/08/1936	09/10/2015	7
64	SPOT 6	Mustang Minerals Corp	05/08/2005	04/10/2015	92
65	SPOT1	Mustang Minerals Corp	21/08/2002	20/10/2015	65
66	SPOT2	Mustang Minerals Corp	21/08/2002	20/10/2015	85
67	SPOT3	Mustang Minerals Corp	21/08/2002	20/10/2015	247
68	SPOT4	Mustang Minerals Corp	04/09/1992	03/11/2015	61
69	SPOT5	Mustang Minerals Corp	04/09/1992	03/11/2015	57
70	VENI	MNCM	25/07/1919	23/09/2017	21
71	YNOT 1	Mustang Minerals Corp	10/01/2013	11/03/2015	144
72	YNOT 2	Mustang Minerals Corp	10/01/2013	11/03/2015	144
73	YNOT 3	Mustang Minerals Corp	16/04/2013	15/06/2015	40
74	YNOT 4	Mustang Minerals Corp	16/04/2013	15/06/2015	256
75	YNOT 5	Mustang Minerals Corp	16/04/2013	15/06/2015	240
<b>Totals</b>					<b>7,286</b>

Note: MNCM = Makwa Nickel Chrome Mines Ltd., now a subsidiary of Mustang Minerals Corp.

### **OPTION AGREEMENT WITH EXPLORATUS ELEMENTIS DIVERSIS LTD.**

In January 2005, Mustang and Exploratus signed a letter of intent for the purchase and sale of Exploratus' 60% interest in the Mayville Property Joint Venture Agreement with MNCM, dated April 10, 1997 and amended February 15, 2000. The purchase price of \$500,000 was payable in the form of \$90,000 cash, a note for \$165,000 due on November 16, 2006, and

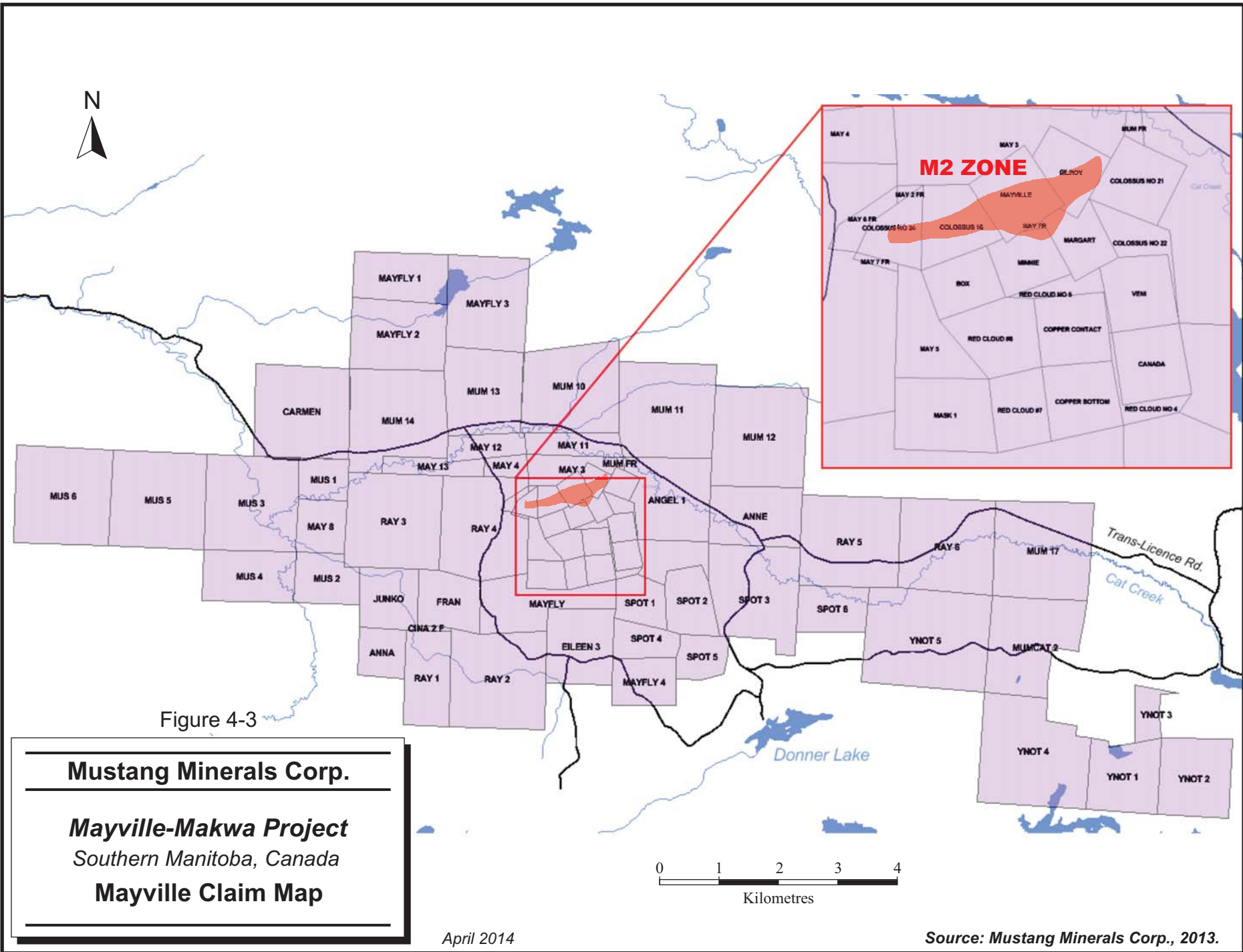
700,000 common shares subject to various hold and escrow periods. The sale was subject to regulatory and Exploratus shareholder approval and to a 30-day right of first refusal of MNCM, the 40% minority partner in the Mayville Property Joint Venture. The general terms of the agreement were accepted by both parties and MNCM did not exercise its right of first refusal within the time allotted. The formalized purchase and sale agreement of Mustang's initial 60% interest in the Mayville Property was executed on March 31, 2005, with Exploratus shareholders approving the transaction on May 16, 2005. Exploratus retained a 2% NSR royalty on its 60% interest including any mineral rights obtained by Mustang within an 800 m area of interest. Pursuant to an agreement dated December 29, 2011, Mustang purchased the Exploratus NSR royalty (equal to 60% of a 2% modified NSR) by issuing 600,000 common shares of Mustang.

On April 8, 2005, Mustang purchased a 72.6% interest in MNCM from Falconbridge, the majority shareholder of MNCM. Terms of the acquisition included a \$120,000 cash payment by Mustang to Falconbridge on closing and the issuance of 400,000 common shares of Mustang. A \$210,000 no-interest bearing note is due and payable to Falconbridge over a period of five years in the event that the commercial production is achieved from any part of the properties owned by MNCM. No royalties or off-take rights were retained by Falconbridge in the underlying property assets. The remaining 27.4% of MNCM is owned by 121 minority shareholders.

In summary, Mustang's January 2005 purchase agreement with Exploratus gained a 60% interest in the fifty-four claims of the Mayville Property. At that time, the remaining 40% was owned by MNCM. Mustang's April 2005 purchase of 72.6% of MNCM resulted in a total interest of 89.04% in those 54 claims that make up part of the Mayville Property. The M2 Deposit and current Mineral Resource are located within this set of claims.

#### **OPTION AGREEMENT WITH TANTALUM MINING CORPORATION**

Under the option agreement, Mustang had the right to earn 100% of the seven claims currently under Tantalum Mining Corporation (Tantalum). To complete the obligations under the Tanco Option, Mustang was obligated to make cash payments of \$45,000 (paid) and complete \$250,000 in work expenditures by June 2013. On August 9, 2013, the seven claims were transferred 100% to Mustang including SPOT 1, SPOT 2, SPOT 3, SPOT 4, SPOT 5, SPOT 6, and EILEEN 3 (Table 4-2).



4-11

Figure 4-3

**Mustang Minerals Corp.**  
**Mayville-Makwa Project**  
Southern Manitoba, Canada  
**Mayville Claim Map**

April 2014

Source: Mustang Minerals Corp., 2013.

## **5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY**

The following description of the accessibility, climate, local resources, infrastructure, and physiography for the Makwa and Mayville properties is taken from Ross (2013) and Duke et al. (2008).

### **TOPOGRAPHY**

The topography of the Project area is typical of the Canadian Shield. It has a gentle rolling surface with elevations ranging from 300 m to 400 m above sea level with a maximum local relief variation around 15 m. The terrain consists of low rock outcrop ridges separated by low-lying areas containing muskeg swamp, small rivers, streams and beaver ponds. Vegetation consists mainly of jackpine and hazel brush with minor white spruce and poplar trees in the positive relief areas, and willows, tamarack and black spruce in the gullies and muskeg areas.

### **ACCESSIBILITY**

Road access to the Makwa Property is provided by paved roads approximately 90 km northeast from Winnipeg to the community of Lac du Bonnet, then 61 km northeast of Lac du Bonnet. From Lac du Bonnet, there is road access by Manitoba Provincial Road 313 to Pinawa Bay, and then Manitoba Provincial Road 315 to the property. Manitoba Provincial Roads 313 and 315 are all-weather paved roads in good condition. Manitoba Provincial Road 315 changes to a gravel road at Bird River, but is well maintained to provide access to lodges and homes of permanent residents east of the property area. The Nopiming Lodge is located approximately six kilometres east of the property on Bird Lake and provides accommodation, food, and gasoline year-round.

The Mayville Property is accessed by driving north from the Makwa Property on Provincial Road 314 that leads to the Trans Licence Road, which bisects the Mayville Property. The Trans Licence Road is a private road previously owned by the Tembec Forest Resource Management Group. An unmaintained trail leading to the M2 Deposit provides all-season access by either all-terrain vehicle or snowmobile.

## **CLIMATE**

The climate at the Property area is northern temperate with long cold winters and short summers. Average daily highs range from 20°C in July to -18°C in January. Mean annual precipitation in the general area ranges from 475 mm to 620 mm, with about 25% of the total falling as snow. Mean annual lake evaporation is approximately 435 mm and mean annual surface runoff is approximately 200 mm. Mining and drilling operations can be carried out year-round.

## **LOCAL RESOURCES AND INFRASTRUCTURE**

Lac du Bonnet (with a population of approximately 1,100) is a small agricultural community located 60 km southwest of Makwa. Winnipeg offers a comprehensive range of services and supplies. Mining personnel are assumed to be available from Lac du Bonnet and Bissett, Manitoba, and from the Kenora and Red Lake areas of Ontario. The Tanco mine (owned by Tantalum) is located five kilometres from the Makwa Property. In the 1970s, when Falconbridge operated the Makwa mine, it was staffed principally with personnel living in the Lac du Bonnet area.

The Canadian Pacific Railway main line passes east-west through Molson and Whitemouth, 45 km south of Lac du Bonnet, and can be used for dispatching concentrate and other heavy freight (as has been done in the past by both Falconbridge and Canmine at the formerly producing Makwa and Dumbarton).

Three-phase power is supplied to the Makwa site by a Manitoba Hydro line, including 7.2 kVA to ground and 12.24 kVA phase-to-phase. Process water is available from Bird River south of the Makwa open pit. Sufficient surface rights for mining operations, potential waste rock storage and associated infrastructure are present on the property.

## 6 HISTORY

### MAKWA

The Makwa property was partially mined from two separate deposits located on the property by MNM, controlled by Falconbridge. The Dumbarton mine and F-Zone were mined from 1969 to 1974, and the Makwa (then Maskwa) Mine was mined from 1974 to 1976. Open pit mining operations ceased due to low nickel prices. The mineralization of both deposits remains open at depth (Duke et al., 2008).

The Makwa exploration and production history is summarized in the following list after Harper, 2004 and Evans, 2005:

- 1900-1929: Prospecting, claim staking and trenching.
- 1929: Manitoba Copper Company: Eleven drill holes totalling 653 m targeting copper and nickel mineralization on various showings on the property. The best intersections returned 1% Cu to 2% Cu and 1.5% Ni.
- 1936-1937: Northfield Mining Company Ltd.: 21 drill holes totalling at least 1,261 m targeting nickel and copper mineralization on the showing that would later be mined as the Dumbarton Ni-Cu deposit. Records of this work are incomplete.
- 1943-1944: Bird River Chromite: Nine drill holes totalling 894 m intersected grades up to 27% Cr<sub>2</sub>O<sub>3</sub> over one metre.
- 1952-1957: MNM: 75 drill holes totalling approximately 7,622 m on the Dumbarton deposit ("B-" series holes).
- 1965: MNM: Nine drill holes totalling 1,220 m on the Dumbarton deposit.
- 1968: MNM: 14 drill holes totalling approximately 1,250 m into the Dumbarton deposit. Records of this work are incomplete. Completed an audio frequency magnetotelluric (AFMAG) ground survey and a fluxgate magnetometer ground survey.
- 1969-1973: MNM: Entered into an agreement with Consolidated Canadian Faraday Limited to mine the Dumbarton deposit and the F-Zone, which produced approximately 1,540,000 t of ore averaging 0.81% Ni and 0.30% Cu. Ore was trucked to Gordon Lake, Ontario for milling.
- 1975: MNM: Performed approximately 80 km of line-cutting and 72 km of ground electromagnetic (EM) and magnetometer surveys. Ninety-seven drill holes were completed totalling approximately 15,244 m. The Maskwa deposit was discovered in May 1974.

- 1976: MNM: Mined 332,000 t averaging 1.16% Ni and 0.20% Cu by open pit. Ore was trucked to Gordon Lake, Ontario for milling.
- 1987: MNM: Approximately 24 km of induced polarization (IP) surveying and eight drill holes totalling 1,893 m targeted platinum and palladium mineralization. Best intersections were 1.5 m of 305 ppb Pt and 1,215 ppb Pd, 1.4 m of 3.97 ppm Au, and 1.3 m of 3.95 g/t Au.
- 1996-1999: Canmine: Acquired the property from MNM and carried out environmental studies (1996-1998), geophysical surveys (1998), 63 drill holes totalling 17,110 m (September 1996 to March 1998), including 52 drill holes totalling 14,959 m on the Maskwa deposit, and estimated the Maskwa deposit resource (1998 and 1999). A scoping study on concentrate treatment was completed in 1999. Surface and mining leases were granted in 1999.
- 2003: Canmine: Canmine ordered to liquidate its assets on February 26, 2003.
- 2003: Global Nickel Inc: Global Nickel purchased a 100% undivided interest in the Maskwa Property.
- 2004-2005: Mustang: May 19, 2004, Mustang acquired a 100% interest in Global Nickel and completed 36 drill holes totalling 6,228 m.

## MAYVILLE

The Mayville exploration and ownership history is summarized below after Ross, 2013. There has been no past production on the Mayville property.

- 1917: First claims at Mayville staked by Mr. Amos May to cover a copper-nickel showing.
- 1921: Devlin Mining and Development Company Ltd. (Devlin): Optioned the Mayville claims and enlarged the property. Devlin drilled eight diamond drill holes (C1 to C8) totalling 1,831 ft east and south of the M2 Deposit.
- 1928 to 1944: Several companies continued to explore at Mayville including fifteen holes for approximately 9,500 ft of drilling. No logs or drill core were located prior to 1956.
- 1951: MNM: Acquired the Mayville Property. Falconbridge, the majority shareholder of MNM, conducted all exploration work on behalf of MNM. From 1956 through to 1990, Falconbridge drilled 21 holes (M-1 to M-21) for a total length of 10,680 ft. M-16 returned narrow but significant copper and platinum group element (PGE) mineralization. Drilling tested geophysical targets or extensions of known mineralization. Geophysical campaigns during that time included: regional airborne magnetic surveying, ground magnetics, EM, and IP.



- 1995: Exploratus: Purchased a 60% interest in the Maskwa-Mayville properties. Exploratus targeted chromite mineralization and conducted vertical gradient and magnetic surveying, and drilled eight holes totalling 2,742 ft.
- 2005: Mustang: Purchased Exploratus' 60% interest in the property and 72.6% of MNMCM, which at that time owned the remaining 40% of the property. Mustang's drilling and other exploration work is described in Sections 9 and 10 of this report.

## **HISTORICAL RESOURCE ESTIMATES**

There has been no historical resource estimates made on the Mayville property. A historic resource estimate for the Makwa deposit was carried out by Canmine in 1998 for a total of 2.66 million tonnes averaging 1.27% Ni, 0.21% Cu, 0.04% Co, 0.3 g/t Pt, and 1.1 g/t Pd (Ferreira, 1999). This historical estimate pre-dates NI 43-101 and does not comply with the Instrument. This historic resource estimate is cited for historical purposes only and is not to be relied upon.

RPA has previously prepared Mineral Resource estimates for Makwa (Evans, 2005) and Mayville (Ross and Evans, 2006; Ross, 2010). The Makwa estimate was last updated by Wardrop in 2007 (Duke et al., 2008). In May 2008, Micon prepared a report titled: "Independent Technical Report Presenting Mineral Resource and Reserve Estimates and the Results of the Prefeasibility Study for the Maskwa Property, Manitoba".

The Mineral Resource estimate described in Section 14 of this report supersedes the above estimates.

## 7 GEOLOGICAL SETTING AND MINERALIZATION

As noted previously, Makwa and Mayville are approximately 30 km to 35 km apart. Makwa's primary metal is nickel followed by copper and cobalt. Mayville's primary metal is copper followed by nickel and palladium. Makwa is associated with the layered ultramafic unit known as the Bird River Sill. Mayville is associated with the Mayville Intrusion, a Neoproterozoic layered ultramafic intrusive. Host rocks are similar petrographically, but sulphide mineralization shows differential concentrations of copper, nickel, chrome, and PGE in the two deposits.

The following description of the geological setting and local geology of the Makwa and Mayville properties is mostly taken from Evans, 2005; Jacobs et al., 2007; Duke et al., 2008; and Ross, 2013.

### REGIONAL GEOLOGY

The Makwa and Mayville properties are located in the east-west trending Archean Bird River greenstone belt (BRGB) at the western edge of the exposed Superior Province of the Canadian Shield in southeastern Manitoba, bounded by the English River subprovince to the north and the Winnipeg River subprovince to the south (Figure 7-1). The unconformable contact with Paleozoic sediments of the Interior Platform is located 65 km to the west.

The BRGB has been recently identified by work of the Geological Survey of Canada as part of a newly defined mineralization event in the Superior Province, prospective for Cr-Ni-Cu-PGE-V deposits. This metallogenic event has been suggested to include the Ring of Fire area and the BRGB (Houle et al., 2013).

The BRGB consists of bimodal assemblage of metavolcanic rocks and platform-type metasedimentary rocks that have undergone various stages of deformation, greenschist to amphibolite facies metamorphism, and are locally intruded by differentiated felsic to ultramafic rocks. The belt is bounded by granites and gneisses, which together form a typical assemblage of the Superior Province.

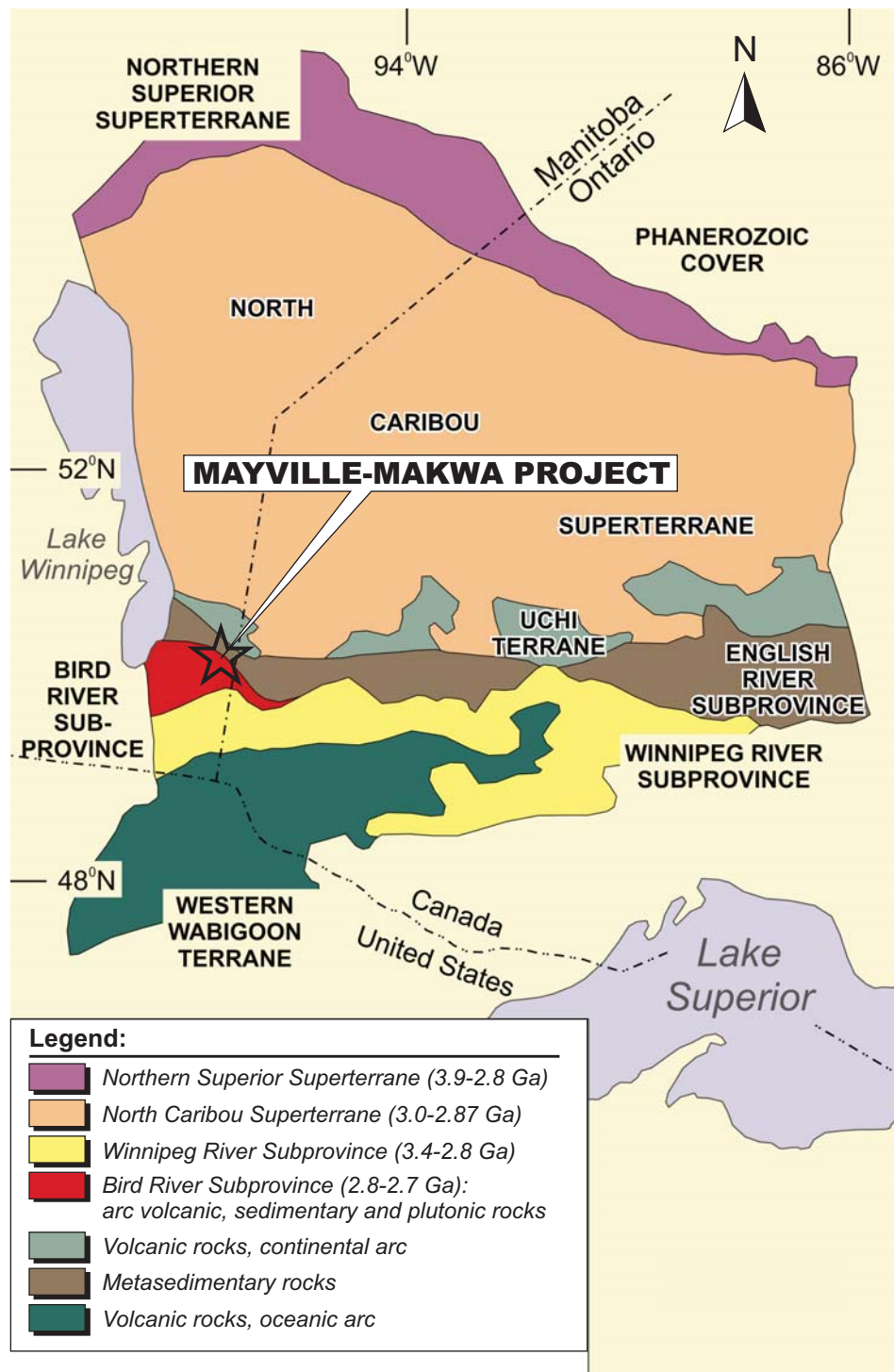


Figure 7-1



**Mustang Minerals Corp.**

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**Mayville-Makwa Project**  
Southern Manitoba, Canada  
**Regional Geology**

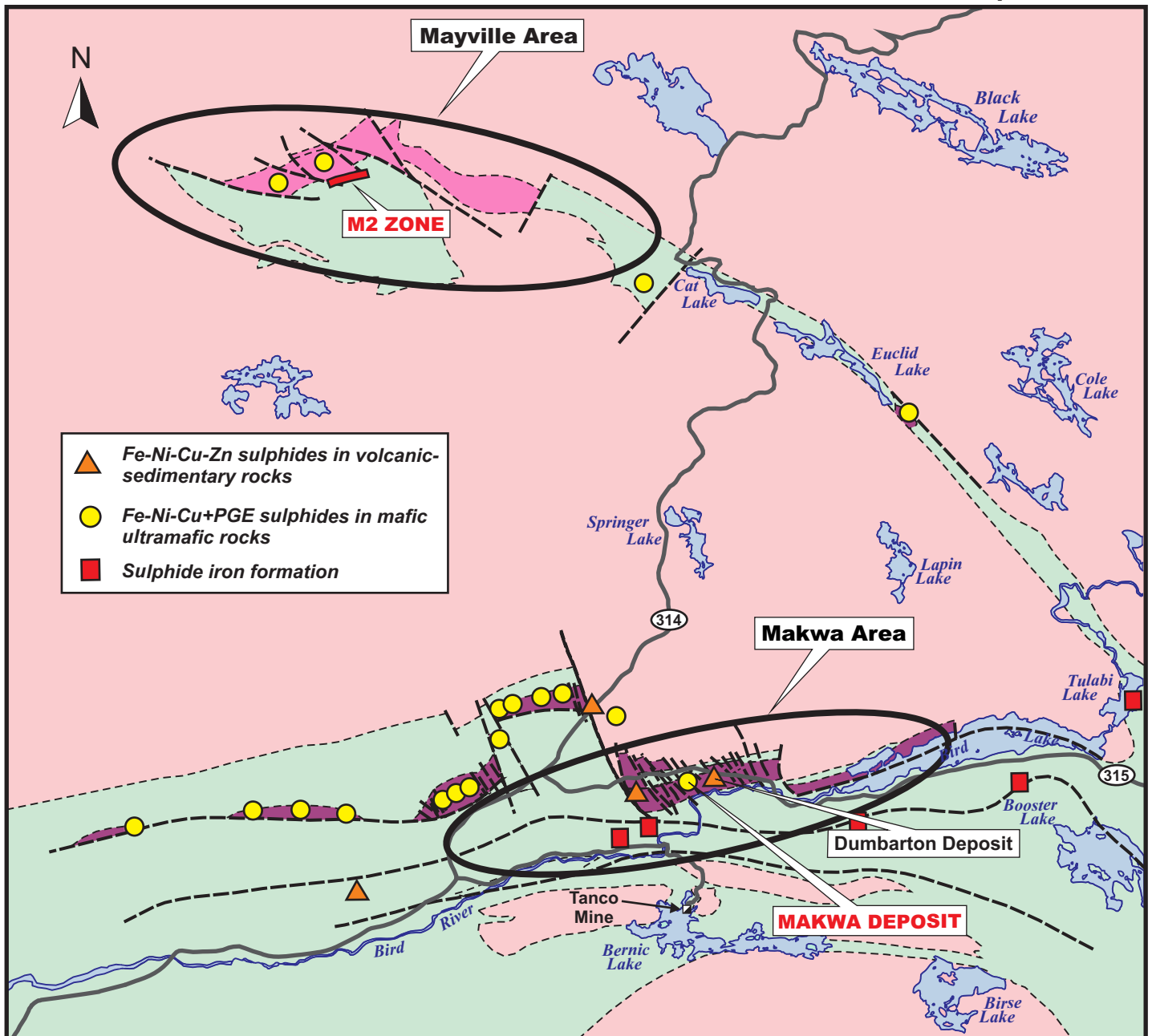
## LOCAL GEOLOGY

The BRGB can be described as two sub-belts, which converge near Tulabi Lake (Figure 7-2). The two branches are separated by the quartz dioritic - granodioritic intrusion known as the Makwa Lake Batholith (Duguet et al., 2005). Other parts of the BRGB are bounded by felsic to intermediate gneissic rocks and other intrusive rocks of the Bird River Domain.

The east-west trending southern branch of the BRGB ranges in thickness from three to ten kilometres. It is dominated by pillowed and massive mafic to felsic metavolcanic rocks, clastic metasediments, and metaconglomerates of the Rice Lake Group. The layered mafic-ultramafic Bird River Sill (2,470 Ma) intrudes this southern branch and hosts Ni-Cu-sulphide deposits, stratiform chromite, and PGE occurrences. The Makwa property is associated with the Bird River Sill (BRS).

A northern branch of the BRGB converges to the southern branch near Tulabi Lake. This 40 km long belt varies from less than one to four kilometres thick, and hosts the Mayville Intrusion, which in turn hosts the nickel-copper mineralization and Mineral Resources at the Mayville property. Supracrustal rocks of the northern splay face north and are composed mainly of pillowed and flow-textured volcanic rocks.

Syn- to late-tectonic felsic intrusions include pegmatitic granites and rare earth element enriched pegmatites.



- ▲ Fe-Ni-Cu-Zn sulphides in volcanic-sedimentary rocks
- Fe-Ni-Cu+PGE sulphides in mafic ultramafic rocks
- Sulphide iron formation

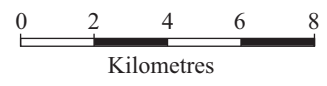


Figure 7-2

- Legend:** *(Modified from Theyer, 2004)*
- Undifferentiated Felsic Plutonic Rocks
  - Bird River Sill
  - Mayville Intrusion
  - Bird River Greenstone Belt - Supracrustal Rocks
  - Geological contact (approximate)
  - Fault

**Mustang Minerals Corp.**

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**Mayville-Makwa Project**  
Southern Manitoba, Canada

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**Local Geology**

## PROPERTY GEOLOGY

### MAKWA

The major stratigraphic feature of the Makwa property is the BRS, which extends for eight kilometres across it (Evans, 2005). It consists of an upper anorthositic section, approximately 500 m thick, and a lower 500 m thick section of metaperidotite and metapyroxenite. The anorthosite is a very distinctive rock containing large, five to ten centimetre-sized, white feldspar porphyroblasts in a darker matrix. A sedimentary package of sandstones, conglomerates, and graphitic shales overlies the BRS to the south. Mafic volcanic rocks underlie the BRS to the north and display large well-developed pillows in several glacially planed outcrops close to Highway 315 (Figure 7-3).

Along the northeast side of the property, the granite basement is stratigraphically overlain by a sulphide iron formation. The iron formation is intermittently continuous for eight kilometres across the Makwa Property and outcrops near Highway 315, south of the Highway 314 junction, approximately 7.5 km further west at the same stratigraphic horizon. It averages approximately one to two metres thick and is cross-cut by younger gabbroic and ultramafic rocks. The Dumbarton deposit, which was the first deposit to be mined on the Makwa property, is part of this stratigraphic horizon. The iron formation is a tabular stratiform deposit that contains layered sulphide and chert bands. It is overlain by pillowed mafic volcanic rocks to the south and is underlain by granite to the north. The Dumbarton deposit is located along the basal contact of the underlying mafic volcanic flow in contact with sulphide facies iron formation.

The Makwa deposit is hosted in peridotite along the basal contact of the BRS. It is located in an area where the ultramafic rocks abruptly change contact relationships from concordant to discordant; the gabbro and ultramafic rocks discordant to stratigraphy may represent a root or feeder zone to the BRS.

The property is crosscut by northwest-southeast striking faults and near-flat-lying block faults. These faults disrupt stratigraphy on outcrop; they have been interpreted from TEM survey results and are visible in drill core. Strike slip faults are also evident, but the extent to which they are a major factor in tectonic evolution is unknown. There is one northwest-striking fault that cut the Makwa mineralized zone and that was re-exposed on each mining bench. Vugs are present in massive sulphide mineralization in the fault zone and contain

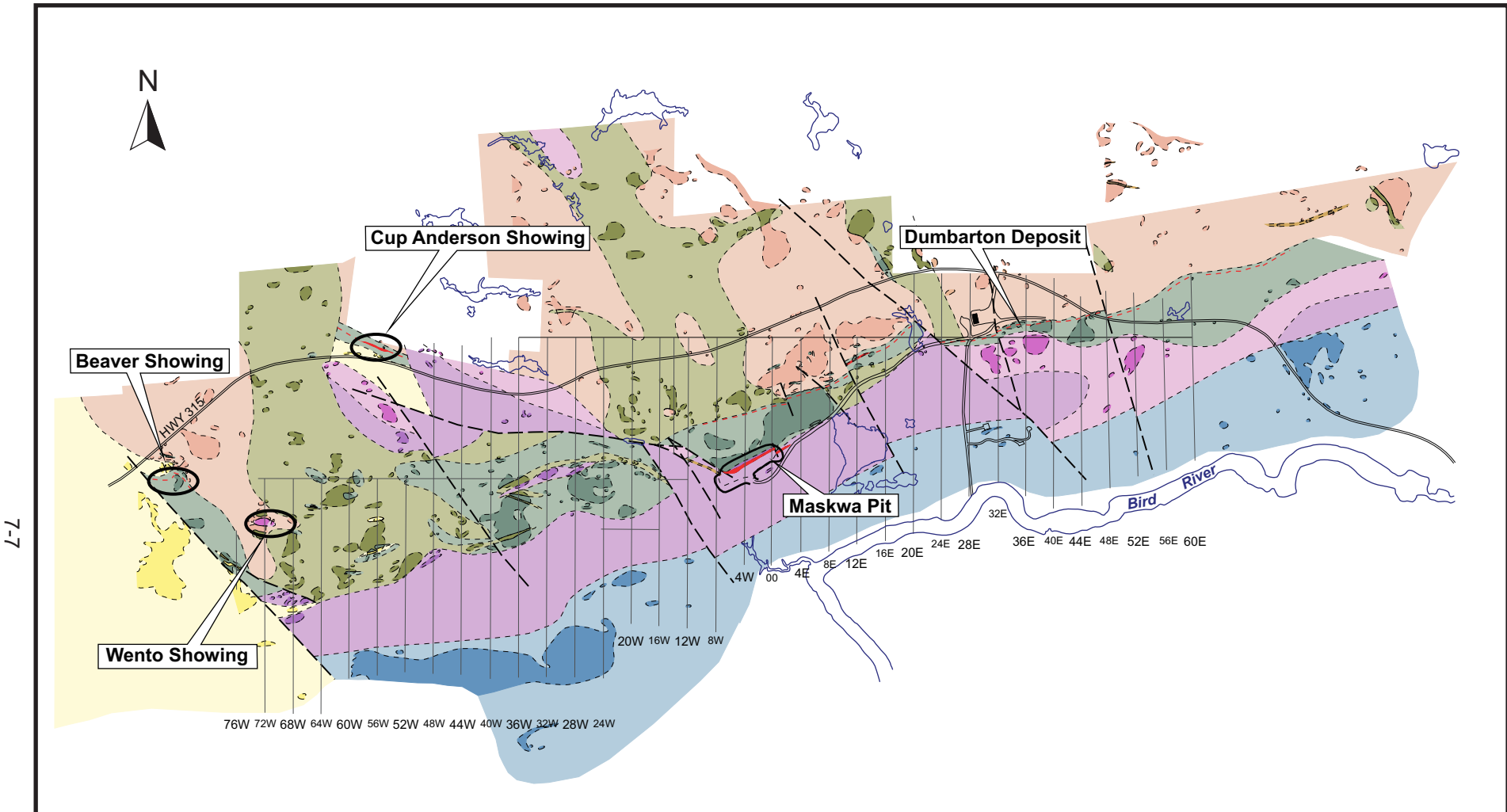
radiating millerite crystals. This fault may have had a reverse movement and thickened the deposit locally.

## **MAYVILLE**

The Mayville M2 mineralization is associated with the Mayville Intrusion (Figure 7-4). The upper and lower contacts of the intrusion are not exposed. Airborne geophysical data suggest that overall dimensions of the intrusion are 10 km in length by 1.1 km thick. The intrusion is bounded to the north by felsic to intermediate orthogneiss and to the south by mafic to intermediate metavolcanic rocks of the Lamprey Falls Formation. The Lamprey Falls Formation is an overturned sequence of mafic volcanic rocks dipping to the south, with stratigraphic tops to the north.

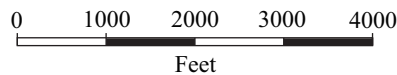
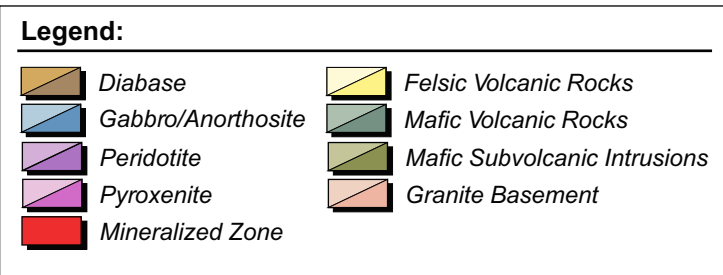
The Mayville Intrusion has undergone upper greenschist to amphibolite grade metamorphism. Original igneous textures are often preserved since deformation is mainly confined to areas proximal to shear zones. The intrusion is divided into upper and lower zones (Figure 7-5). The 700 m to 800 m thick upper zone consists of leucogabbroic and anorthositic rocks displaying a variety of textures including massive, poikilitic, and megacrystic leucogabbro. The 200 m to 300 m thick lower zone consists of a heterolithic breccia and is host to the M2 Deposit mineralization. The breccia zone consists of leuco- to melagabbros, gabbro-norites, and xenoliths (inclusions of pre-existing rock in an igneous rock) of mafic volcanic rock. Amphibole represents more than 90% of all mafic minerals, making it impossible to determine if the original rocks were gabbros or norites (Huminicki, 2005).

Sulphide mineralization consists of chalcopyrite, pyrrhotite, pentlandite, and pyrite in a variety of textures including disseminated, blebby, vein, semi-massive, and massive. Oxide mineralization is also abundant within the intrusion and consists of disseminations, pods, or bands of chromite and/or magnetite.



Geology from Falconbridge (1975) geological interpretation map

Figure 7-3

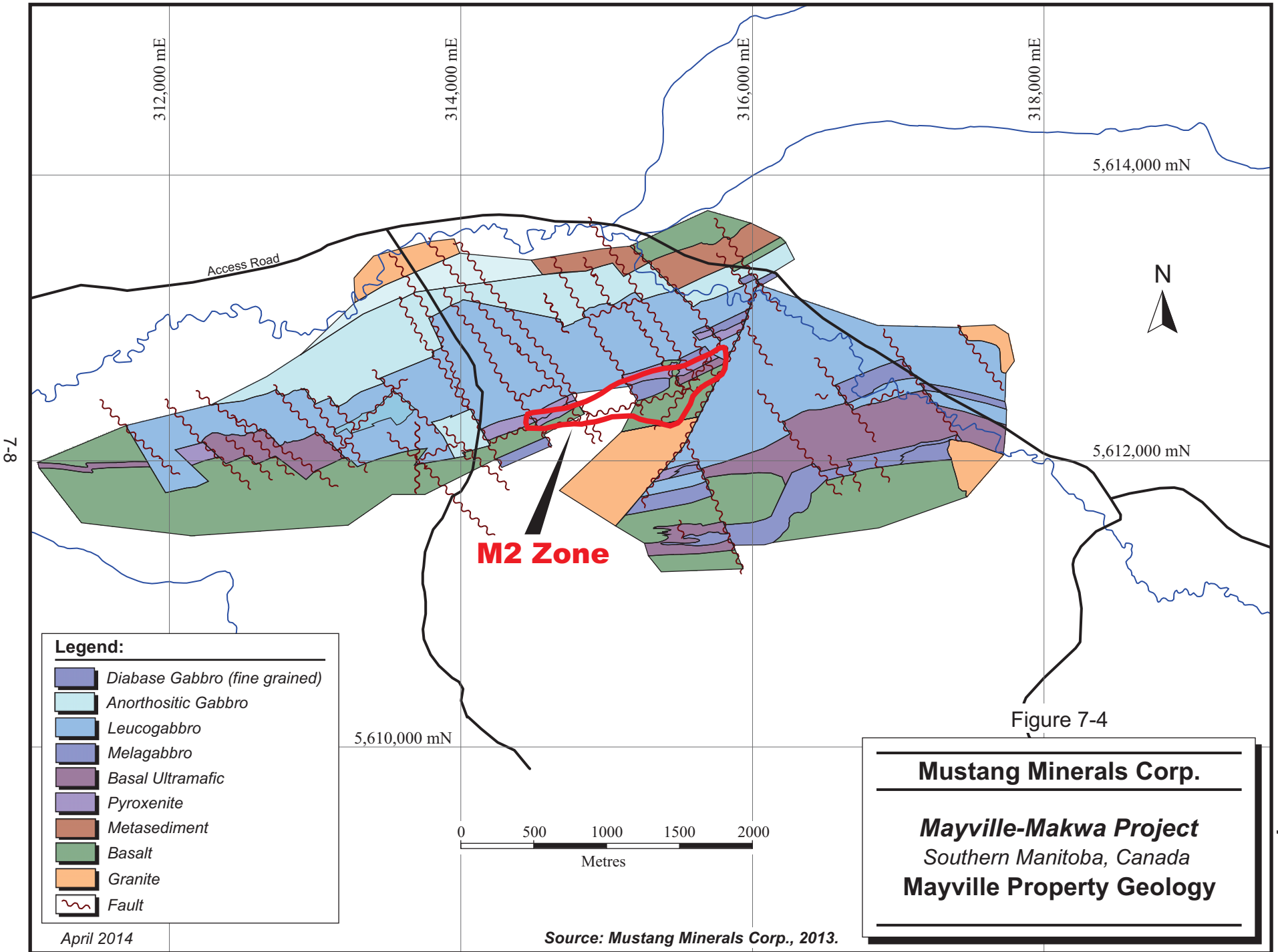


Mustang Minerals Corp.

Mayville-Makwa Project  
Southern Manitoba, Canada

Makwa Local Geology





**Legend:**

- Diabase Gabbro (fine grained)
- Anorthositic Gabbro
- Leucogabbro
- Melagabbro
- Basal Ultramafic
- Pyroxenite
- Metasediment
- Basalt
- Granite
- Fault

April 2014

Source: Mustang Minerals Corp., 2013.

Figure 7-4

**Mustang Minerals Corp.**

**Mayville-Makwa Project**  
 Southern Manitoba, Canada  
**Mayville Property Geology**

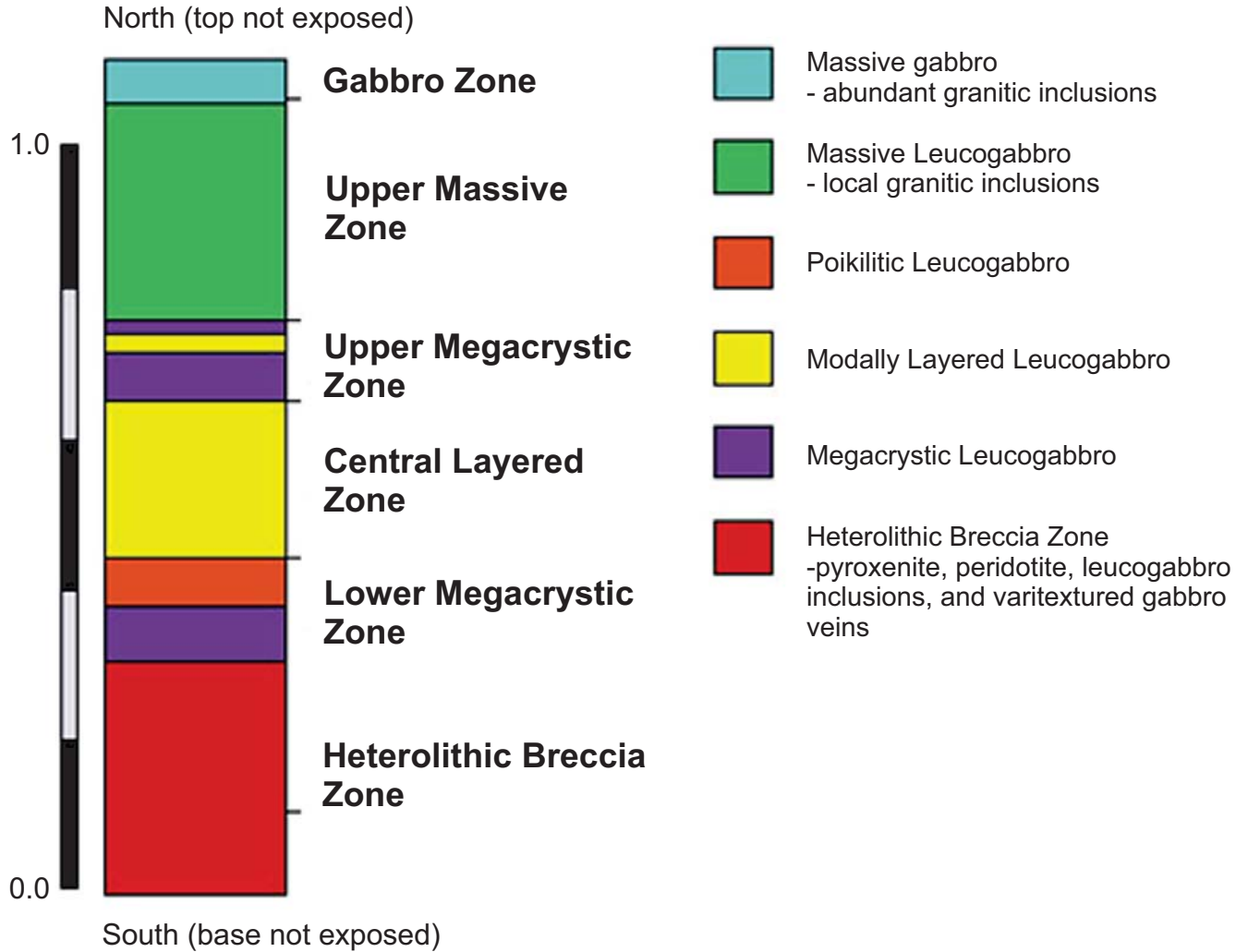


Figure 7-5

**Mustang Minerals Corp.**  
**Mayville-Makwa Project**  
 Southern Manitoba, Canada  
**Type Section of the**  
**Mayville Intrusion**

## MINERALIZATION

### MAKWA

Four styles of mineralization on the Makwa Property are summarized in Ferreira et al., 1999 and some smaller mineralized showings are discussed in Juhas, 1973:

1. Magmatic nickel-copper mineralization,
2. Sulphide iron formation nickel-copper mineralization,
3. Sulphide iron formation copper mineralization,
4. Chromite mineralization.

#### **MAKWA NICKEL-COPPER DEPOSIT**

The Makwa deposit consists of disseminated pyrrhotite, pentlandite, chalcopyrite, and pyrite in an ultramafic peridotite layer at the base of the BRS (Ferreira et al., 1999; Harper, 2004). The higher grade mineralization near the footwall contact contains approximately 15% disseminated sulphide minerals. About 12% of the sulphides contains nickel.

The host rock of the Makwa deposit is an ultramafic rock consisting of serpentine pseudomorphs after olivine and pyroxene phenocrysts in a talc-carbonate groundmass. The deposit is concordant with and located just above the peridotite-mafic volcanic contact. A root or feeder zone to the BRS is located immediately to the west of the Makwa deposit.

The Makwa deposit strikes at approximately N60°E to N70°E and dips at -60°S to -90°. The overall average strike is approximately N68°E, however, shorter segments appear to strike at approximately N62°E. The western part of the deposit, west of section 7+00W (original grid), strikes approximately 280° at surface and the strike progressively changes down to approximately the 500 ft elevation, where the overall deposit strike becomes more linear. The deposit dips at approximately -70°S or less at the northeast and southwest extremities and dips at -80°S or steeper from approximately section 3+00W to section 8+00W (original grid). The deposit is approximately 500 m long by 10 m wide and extends to at least 500 m below surface. The deposit appears to have a moderate plunge to the southwest. Based on surface mapping and diamond drill hole interpolation, several fault offsets have been interpreted in the model.

The mineralization thickness appears to vary locally, which may be due to the original andesite paleotopography and/or related to cross-faults.

### **DUMBARTON DEPOSIT AND F-ZONE**

Sulphide iron formation containing nickel and copper was mined at the Dumbarton deposit and F-Zone, both part of the Makwa mineralization. The iron formation contains pyrrhotite-rich sulphide and chert layers. The widest and highest grade sections of the deposit occur adjacent to both sides of a 60-m long gabbro plug that intruded into the iron formation. Nickel and copper grade-thickness contours suggest that mineralized shoots plunge steeply to moderately to the east and that the F-Zone probably had higher copper grades and much lower nickel grades than the Dumbarton deposit.

The mineralization consists of massive and near-massive pyrrhotite, pentlandite, and chalcopyrite interspersed with mafic material and magnetite. Juhas, 1973 concluded the following:

- There were at least two major processes and/or periods of mineralization.
- Scatter diagrams suggest that nickel and copper are not covariant.
- Nickel to sulphur ratios are extremely variable.
- Nickel content of sulphides diminishes with depth, whereas copper content and sulphide abundance remain rather constant.
- Copper is relatively enriched in the stratigraphically highest portion of the mineralized zone whereas nickel is enriched lower down.

The iron formation on the property forms discontinuous lenses that average approximately 1.5 m in thickness and attain thicknesses of up to approximately 15 m (Evans 2005). It is characterized by a massive magnetite zone near the base with decreasing magnetite and increasing sulphides upwards. Massive sulphide zones are common in the upper part. The unit is well-banded with dark chert bands up to one centimetre thick.

### **CHROMITE MINERALIZATION**

The chromite occurs as stratigraphic layers up to about three metres thick at the transition from ultramafic to anorthositic gabbro at Makwa. In 1943, Bird River Chromite drilled nine holes totalling 894 m over approximately three kilometres of strike length and intersected grades up to 27% Cr<sub>2</sub>O<sub>3</sub> over one metre. The chromite layers may also have potential for nickel, platinum, and palladium.

### **OTHER MINERALIZATION**

Other mineralization at Makwa, including the Cup Anderson, Beaver and Wenton showings, and the 1987 gold intersections, was described by Juhas, 1973 and is summarized in Evans, 2005 and Jacobs et al., 2007.

## MAYVILLE

Nickel-copper sulphide mineralization at the M2 Deposit is hosted at the base of the heterolithic breccia zone, just below the structural hanging wall mafic volcanic rocks of the Lamprey Falls Formation. As noted in the Property Geology section, the sequence is overturned and, therefore, the hanging wall rocks represent the lower contact of the Mayville Intrusion.

RPA interpreted five main mineralized lenses, the Main Zone, Footwall Zone, and East Zone A, B, and C, each with a fairly consistent strike direction of N67°E and variable dips from -60°N to -90°N (Figure 7-6). The true thickness of mineralization ranges from slightly less than two metres to more than 100 m. The average true thickness is in the order of 20 m. Mineralization is continuous along strike, down dip, and has been traced by drilling from surface to a depth of at least 550 m. The deepest intersection is 550 m below surface.

Petrographic analysis confirmed that the mineralization is a typical magmatic sulphide assemblage comprised of pyrrhotite-pentlandite-chalcopyrite, with textures ranging from finely disseminated, to semi-massive net-textured, to inclusion-bearing massive sulphide. Within the mineralized lenses, alteration has destroyed most primary textures, although the semi-massive net-textured sulphides have preserved some primary magmatic textures locally (Huminicki, 2005).

The massive and semi-massive sulphides appear to be more iron and nickel rich, containing predominantly pyrrhotite and pentlandite, whereas the disseminated sulphides are more copper rich, containing predominantly chalcopyrite, with lesser pyrrhotite and pentlandite (Huminicki, 2005).

Examination of drill logs and core indicate that sulphide veining occurs infrequently and is therefore not volumetrically significant at M2. Petrography indicates that pyrrhotite is the predominant mineral in these veins. Pentlandite occurs in the form of 0.25 mm to 2 mm thick granular aggregates forming strings or loops in the pyrrhotite matrix. Chalcopyrite is minor in massive sulphide veins but does occur as fine disseminations within pyrrhotite associated with pentlandite.

Looking Northeast

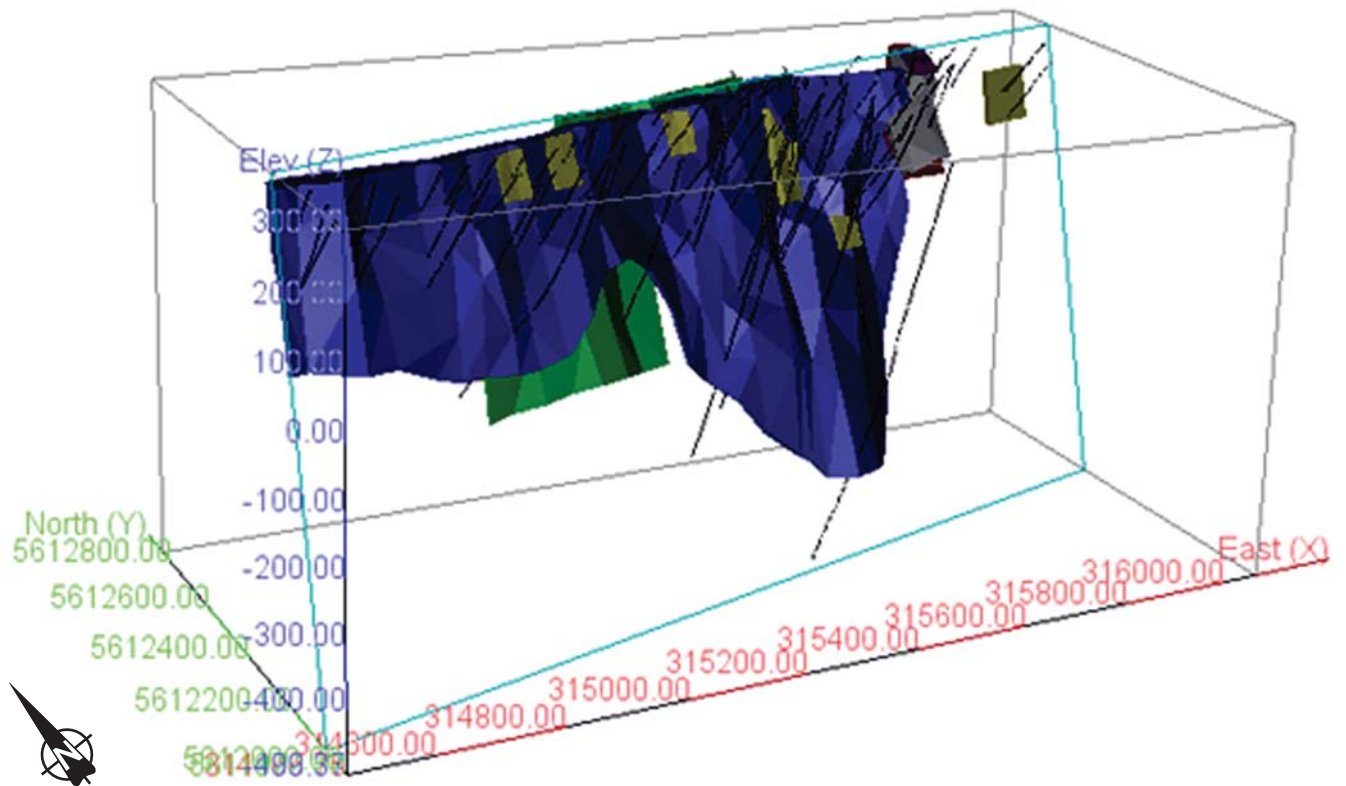


Figure 7-6

**Mustang Minerals Corporation**

**Mayville-Makwa Project**

**M2 Zone - Mayville**

Southern Manitoba, Canada

**3D View of Mineralized Zones**

## 8 DEPOSIT TYPES

Within the Bird River greenstone belt, there are three types of deposits:

1. Magmatic nickel-copper sulphide deposits
2. Nickel-copper bearing iron formation deposits
3. Chromite deposits

### **MAGMATIC NICKEL-COPPER SULPHIDE DEPOSITS**

Magmatic nickel-copper deposits consist of nickel and copper sulphide-rich mineralization associated with differentiated mafic and/or ultramafic sills and stocks or ultramafic volcanic flows and sill. Their ages are commonly Archean and lower Proterozoic (Eckstrand and Hulbert, 2007). Deposits in the Bird River greenstone belt also include tantalum-lithium-cesium pegmatites.

Nickel and copper are the main economic commodities and generally grade between 0.7% Ni and 3% Ni, and 0.2% Cu and 2% Cu. Tonnages range from hundreds of thousands to tens of millions of tonnes (Eckstrand and Hulbert, 2007).

Magmatic nickel-copper mineralization forms in magmas originating in the upper mantle. As they rise through the crust and begin to cool, immiscible sulphide droplets form. The sulphur originates from the magma itself and/or from the wall rocks. The sulphide droplets attract metals such as nickel, copper, iron, and PGEs. These metal-rich sulphur droplets have a high density and, therefore, settle by means of gravity towards the bottom of the magma chamber. As the melt cools further, the sulphide liquid crystallizes to form a concentration of pyrrhotite, pentlandite, and chalcopyrite near the bottom of the chamber (Eckstrand and Hulbert, 2007).

The mineralization is generally concentrated in structurally low areas at the base of the intrusion or in others zones where xenoliths interrupt the settling process. The mineralization is commonly layered in cumulate sequences ranging from massive mineralized material at the bottom to net textured, to disseminated, and to non-mineralized mafic or ultramafic rocks in the upper layer.

Exploration techniques for magmatic nickel-copper deposits include a variety of geophysical techniques. Interconnected sulphide minerals produce electrically conductive zones that can be located with IP, EM, and magnetotelluric surveys. Gravity surveying is useful to identify excess masses from the sulphide mineralization.

### **NICKEL-COPPER-BEARING IRON FORMATION DEPOSITS**

Sulphide iron formation, containing nickel and copper, was mined at the Dumbarton deposit and F-Zone. The iron formation contains pyrrhotite-rich sulphide and chert layers and some local graphitic shales. Juhas (1973) discusses the geology and origin of copper-nickel sulphide deposits of the Bird River area and notes that the iron formations are nickel-bearing on the property where found between granitic intrusions and the ultramafic portion of the BRS. He concluded that the nickel was remobilized from the BRS into the iron formation by hydrothermal convection cells that formed during intrusion of the underlying plutons. Ferreira et al. (1999) state that the widest and highest grade nickel and copper mineralization at Dumbarton occurs adjacent on both sides of a 60 m long gabbro plug that intruded into the iron formation.

### **CHROMITE DEPOSITS**

At Makwa, chromite occurs as stratigraphic layers up to three metre thick at the transition from ultramafic to anorthositic gabbro. In 1943, Bird River Chromite drilled nine holes totalling 894 m over approximately three kilometres of strike length and intersected grades up to 27% Cr<sub>2</sub>O<sub>3</sub> over one metre.

Known historical chromite deposits that occur throughout the Bird River Sill, but outside both the Mayville and Makwa properties, include the Chrome, Page, Bird Lake and Euclid properties. Mustang has encountered chromite in drilling at both the Makwa and Mayville properties.

### **PLATINUM GROUP METALS**

Mustang drilling on the Mayville Property intersected a zone of platinum-palladium mineralization hosted in ultramafic rocks. Drill hole MAY-11-07 intersected 41.1 m at an average grade of 2.9 g/t Pt+Pd including 9.5 g/t Pt+Pd over 9.1 m. Follow-up drill holes in 2011 intersected the zone along strike.



## 9 EXPLORATION

### MAKWA

#### GEOLOGICAL MAPPING

In the late 1960s and mid-1970s, MNMCM mapped the eastern half of the Makwa Property. In 2005, the Manitoba Geological Survey initiated a multidisciplinary program of targeted bedrock mapping, structural analysis, litho-geochemistry, and uranium-lead geochronology in the BRGB (Duguet, 2006).

In 1968, the first extensive cut grid was completed on the Makwa Property. The grid was measured in Imperial units and was likely established for geophysical surveys. It was re-established in 1987 for an IP survey, and again, for the work of Quantec Consulting Ltd. (Quantec) from December 1997 to February 1998 (Duke et al., 2008).

#### GEOPHYSICAL SURVEYS

In 1968, MNMCM conducted an AFMAG ground survey and a fluxgate magnetometer ground survey on the property, covering approximately 72 line-km. The Falconbridge long wire AFMAG system used a crossed-coil audio frequency detector, which received the signal transmitted along a grounded long wire with 30 m intervals on picket lines spaced 60 m and 120 m along a cut baseline. The AFMAG system was able to detect shallow conductors and has since been replaced by numerous EM methods with advantages such as much greater depth penetration.

In 1987, MNMCM conducted an IP survey targeting PGE on the property. Mustang has obtained copies of the assessment files for this work.

In late 1997 and early 1998, Quantec was contracted to complete a surface time domain electromagnetic (TEM) survey, a ground total field magnetic survey, and four three-dimensional borehole TEM surveys (Quantec, 1997, 1998a, 1998b, and 1998c). The surface TEM and magnetometer surveys covered 66.4 and 72.2 line-km, respectively. Lines were spaced at 30 m, 60 m, and 120 m, with closer spacing in higher interest areas. Readings were taken at 30 m and 15 m for the TEM and magnetometer surveys, respectively. The TEM survey identified approximately 70 moderate to very strong chargeability axes of

significance, including 14 high priority targets. The magnetic survey showed the extent of the BRS and other rock formations.

Downhole surveys were conducted in drill holes M-121W (wedge hole off M-121), M-145, and M-149 under and to the west of the Makwa deposit and in drill hole M-151 under the Dumbarton deposit. A summary of mineralized intersections of these drill holes is presented in Table 9-1.

**TABLE 9-1 MINERALIZED INTERSECTIONS IN SURVEYED DRILL HOLES,  
MAKWA PROPERTY  
Mustang Minerals Corp. – Makwa-Mayville Project**

<b>Drill Hole</b>	<b>Length of Mineralization (m)</b>	<b>Nickel (%)</b>	<b>Copper (%)</b>	<b>Depth Below Surface (m)</b>	<b>Section</b>	<b>Relative Drill Hole Location</b>
M-121W	1.2	3.45	1.85	500	16+00W	Along the down-plunge projection of Makwa deposit
M-144	3.00	1.11	0.83	100 m below hole M 145		
M-145	0.5	0.21	0.39	150	26+00W	
M-149	0.26	1.09	0.55	500	2+00E	Passes near eastern tip of Makwa open pit
M-151		Barren	Barren			

Source: Evans, 2005

In the spring of 2007, Mustang contracted Geotech Ltd. (Geotech), of Aurora, Ontario, to perform a helicopter-borne geophysical survey, utilizing its proprietary versatile time-domain electromagnetic (VTEM) system. A total of 652 line-km were flown over the Makwa deposit, and over the contiguous land position held by Mustang to the east and west of the deposit. Line spacing was typically at 100 m, although this was reduced to 50 m over the area immediately to the west of the Makwa pit in an effort to locate the source of nickel and platinum group element-bearing massive sulphides. The survey outlined several prominent anomalies, including an EM anomaly to the west of the Makwa deposit (Duke et al., 2008).

In 2008, Mustang completed a Time Domain Induced Polarization (TDIP/Resistivity) and magnetic surveys over part of the Makwa property along the BRS. The survey comprised a grid of 1000 x 3400 m with 100 m spacing. Approximately 34 km of grid lines were covered. Quantitative sections were generated over areas of interest from these surveys to enhance the interpretation of the areas to be drilled. The geophysical survey outlined several high

priority targets warranting drill investigation. Priority targets were associated with the known ultramafic host unit at Makwa but were external to the known main deposit. A second phase of IP geophysics was begun to examine the area to the west of the Makwa Deposit (Mustang, 2009).

## **MAYVILLE**

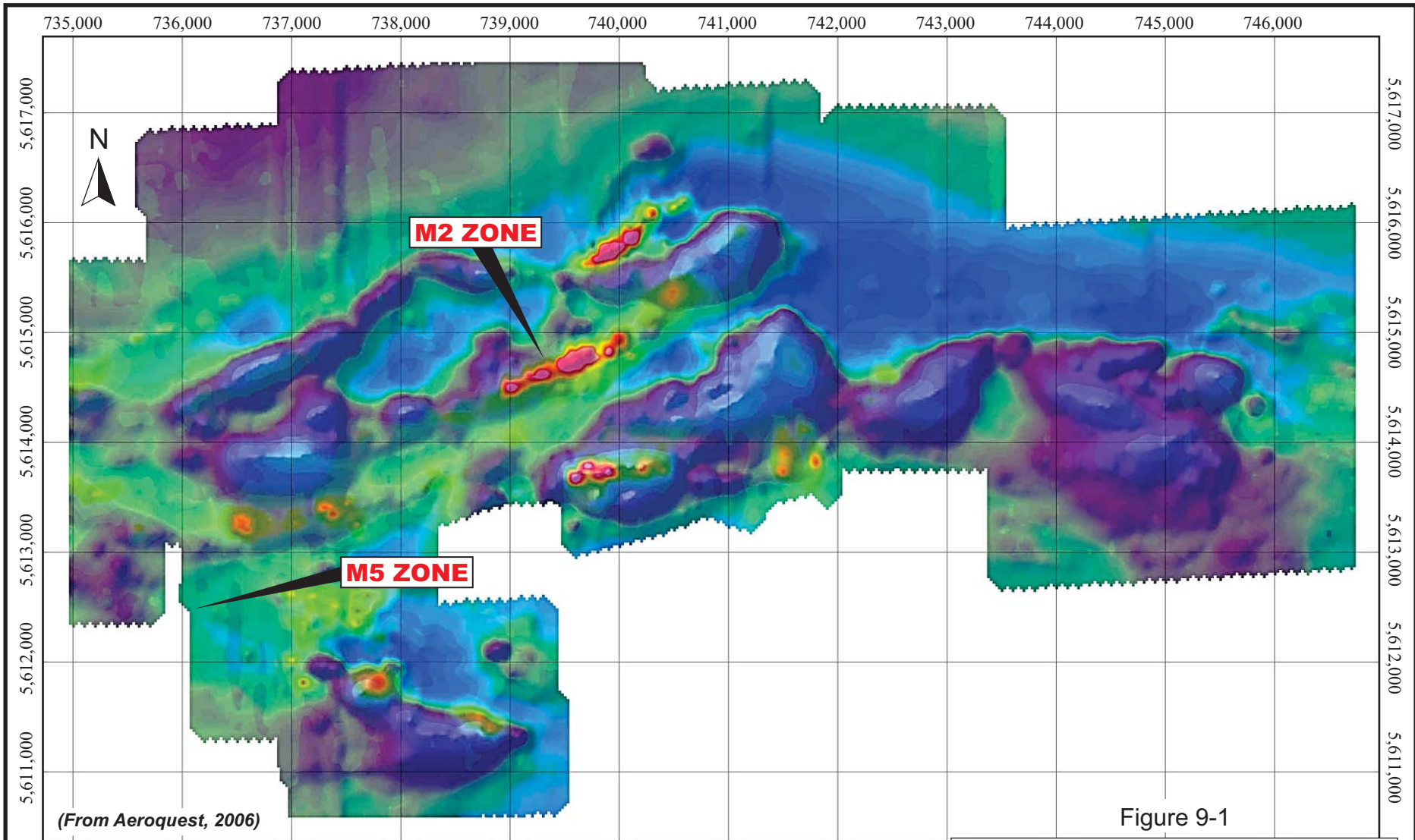
VTEM surveying is the main exploration tool used by Mustang to generate and prioritize drill targets at the Mayville Property. When properly treated, the high resolution data from VTEM can generate drill-ready targets.

In April and May 2005, Mustang contracted Geotech to collect 580 line-km of VTEM airborne EM and magnetic data over the property covering an area of 49 km<sup>2</sup>. North-south flight lines were spaced 100 m apart. The sensors used were a TEM system and a cesium magnetometer.

Geotech, Condor Consulting Inc. of Lakewood, Colorado, and Aeroquest Limited (AQL) of Ontario made separate interpretations of the VTEM data. The main purpose of each interpretation was to identify and prioritize new exploration targets. AQL appears to have made the most appropriate and rigorous data processing and interpretation on the Mayville VTEM. AQL results are discussed below.

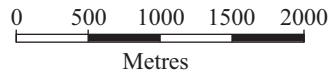
AQL identified and prioritized six drill-ready targets within two areas identified as the M2 and M5 zones (Figure 9-1). The M2 Deposit includes the area of the estimated Mineral Resources described in this Technical Report. AQL recommended three drill targets within M2, all of which have been subsequently drill tested by Mustang and have intersected mineralization. AQL suggests that the sulphide mineralization is structurally controlled and that structures within the mineralization do not offset the mineralization relative to its strike direction.

The M5 Zone lies approximately 2.5 km to the south-southwest of the M2 Deposit. In the M5 Zone, AQL interpreted many moderately conductive features with no associated magnetic anomalies. AQL suggests that the zone is unlikely related to nickel-copper mineralization within the ultramafic intrusive rocks, but still recommends drilling three anomalies.



(From Aeroquest, 2006)

Figure 9-1



**Mustang Minerals Corporation**  
**Mayville-Makwa Project**  
**Mayville Property**  
Southern Manitoba, Canada  
**VTEM Superimposed Over**  
**Shaded Magnetic Field**

In 2010, Mustang acquired an option on seven claims held by Tantalum (now 100% owned by Mustang) adjacent to the Mayville property and subsequently conducted a 218 line-km VTEM survey over the claims. Also in 2010, Mustang conducted a 205 line-km Z-axis tipper electromagnetic (ZTEM) survey over the central part of the property, which included the M2 Deposit and the Tantalum claims.

In 2011, following the discovery of PGE mineralization on the property (in drill hole May-11-07, 9.1 m of 2.8 g/t Pt and 6.7 g/t Pd), Mustang established a 6.0 km by 2.5 km grid over the PGE zone and M2 Deposit and subsequently surveyed these lines with IP-mag and EM during 2011 and 2012. This grid was also geologically mapped during this period. These surveys were followed up with 12,606 m of diamond drilling in 60 holes, which concentrated on evaluating the PGE and nickel-copper potential of the PGE zone and M2 Deposit.

In addition to VTEM surveying, Mustang has researched various Manitoba assessment files, conducted some prospecting, and has compiled a GIS database of all relevant geospatial data.

### **BOREHOLE EM SURVEY**

In 2011, Mustang commissioned a borehole electromagnetic (BHEM) survey from Crone Geophysics and Exploration Ltd., from Ontario, Canada. A total of 23 holes were probed for a total length of 9,600 m at a nominal sample interval of 10 m.

Crone Pulse EM is a TEM method in which a precise pulse of current with a controlled linear shut-off is transmitted through a large loop of wire on the ground and the rate of decay of the induced secondary field is measured across a series of time windows during the off-time. The EM field created by the shutting off of the current induces eddy currents in nearby conductive material thus setting up a secondary magnetic field. When the primary field is terminated, this magnetic field decays with time. The amplitude of the secondary field and the decay rate are dependent on the quality and size of the conductor. At Mayville, a 3D Borehole Pulse EM system was assembled in which an axial component (Z) probe and a cross component (XY) probe were used to measure the three components of the induced secondary field. The first pass with the "Z" probe detects any in-hole or off-hole anomalies and gives information on size, conductivity, and distances to the edge of conductors. The second pass with the "XY" probe measures two orthogonal components of the EM field in a

plane orientated at right angles to the borehole. These results give directional information to the centre of the conductive body.

Results from the BHEM survey helped identify several drill hole targets leading to the intersections listed in Table 9-2.

**TABLE 9-2 DRILL HOLE RESULTS OF BHEM TARGETS, MAYVILLE PROPERTY**  
**Mustang Minerals Corp. – Makwa-Mayville Property**

Hole ID	From (m)	To (m)	Length (m)	Estimated True Thickness (m)	Copper (%)	Nickel (%)
May12-41	407.70	426.00	18.30	13.60	0.40	0.12
May12-43	356.00	400.75	44.75	34.01	0.47	0.15
May12-49	240.00	305.49	65.49	51.57	0.45	0.17
May12-49	197.00	209.50	12.50	10.08	0.46	0.14
May12-56	240.68	269.00	28.32	25.40	0.46	0.18
May12-56	274.00	373.00	99.00	88.95	0.35	0.15
May12-57	330.74	368.56	37.82	31.87	0.75	0.33
May12-58	211.00	217.57	6.57	5.67	0.81	0.20
May12-60	371.60	382.22	10.62	8.00	0.33	0.11

Notes:

1. Assays were capped to 2.5% Cu and 1.5% Ni prior to compositing.
2. True thickness was calculated using a strike direction of 070° and a dip of 66° to the SSE.

## 10 DRILLING

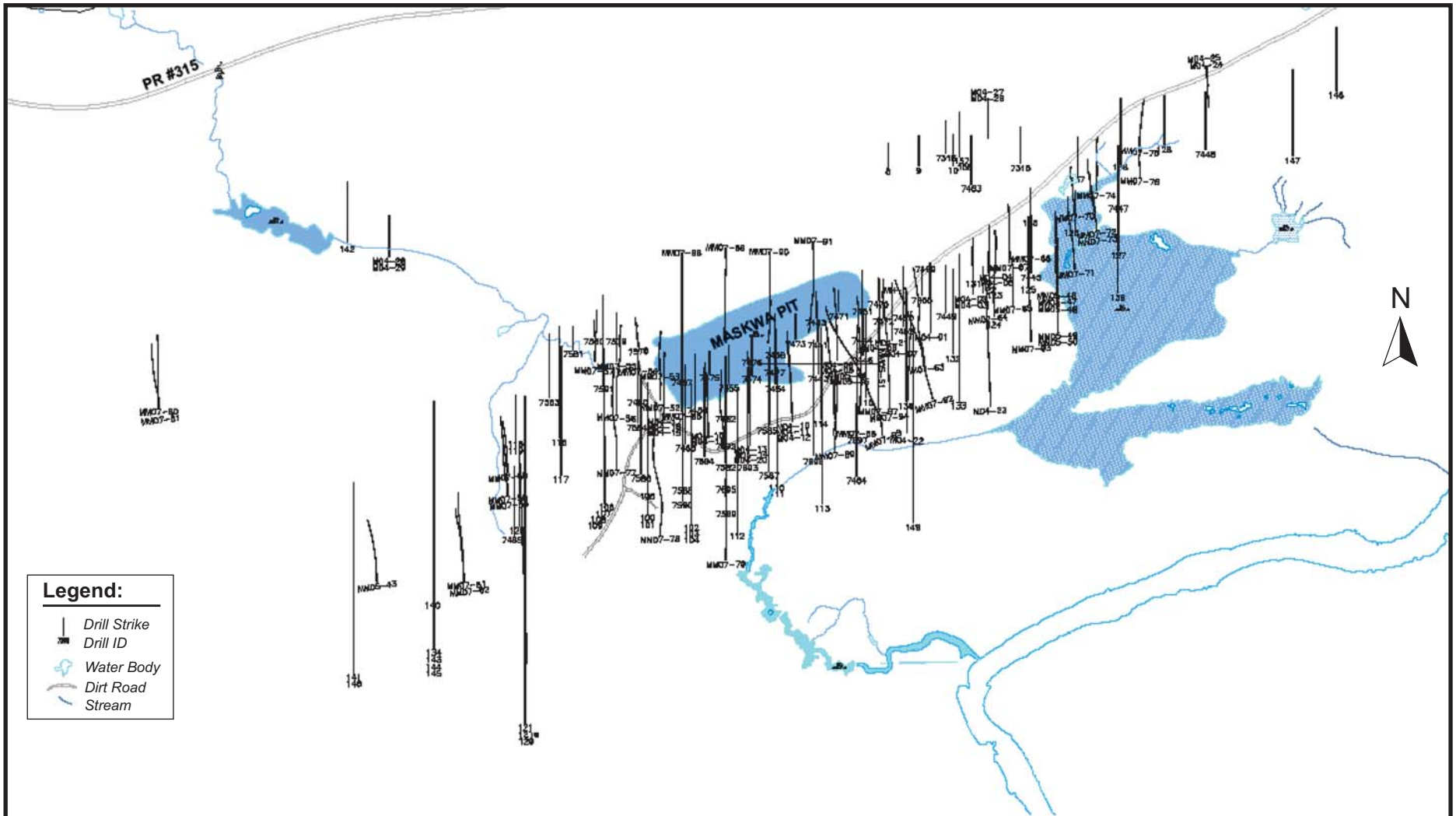
### MAKWA

A total of 417 holes with a combined length of over 60,000 m have been drilled at Makwa since the 1920s (Table 10-1). Of these, 207 are historical drill holes and 110 have been completed by Mustang. The drill hole database used in the current Mineral Resource estimate contains a total of 256 historical (MNCM/Falconbridge and Canmine) and Mustang holes.

**TABLE 10-1 SUMMARY OF DRILLING AT MAKWA  
Mustang Minerals Corp. – Makwa-Mayville Property**

Company	Year	Number of Holes	Metres
Manitoba Copper Company	1929	11	653
Northfield Mining Company	1936-1937	21	1,261
Bird River Chromite	1943	9	894
MNCM/Falconbridge	1952-1957	75	7,622
	1965	9	1,220
	1968	14	1,250
	1973-1975	97	15,244
	1987	8	1,893
Canmine	1966	59	16,800
Canmine	1966-1998	4	310
Mustang	2004-2010	154	30,625
<b>Total</b>		<b>461</b>	<b>77,772</b>

The Makwa drill hole locations are shown in Figure 10-1.



10-2

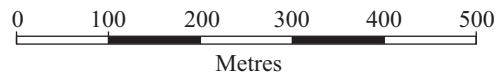
Figure 10-1

**Mustang Minerals Corporation**

*Mayville-Makwa Project*  
*Southern Manitoba, Canada*  
**Makwa Drill Hole Locations**

**Legend:**

- Drill Strike
- Drill ID
- Water Body
- Dirt Road
- Stream





## **HISTORICAL DRILLING**

A total of 307 drill holes for a total of 47,147 m comprise the historical surface drilling at the Makwa Property. Most of the holes targeted the Makwa and Dumbarton deposits.

## **MUSTANG DRILLING**

### ***2004-2007 DRILLING***

Mustang drilled 31 holes in 2004 totalling 5,332 m. These included 23 drill holes on the Makwa deposit, two holes on the near surface western extension of the Dumbarton deposit, and six holes on the geophysical targets. Mustang drilled 20 holes on the property in 2005 totalling 3,541 m. Mustang continued an active exploration program in the resource area and beyond in 2007. Initial drill targets include areas immediately adjacent to the known areas of mineralization both on the west and east limits of the resource. Additional exploration potential exists at depth and in potential feeder structures. Mustang drilled 44 holes totalling 8,577 m in 2007. Split drill core from the program was sent to Accurassay Laboratories (Accurassay) in Thunder Bay, Ontario, for sample preparation and assaying.

In total, Mustang drilled 95 holes for a total of 17,449 m at Makwa from 2004 to 2007. These holes were included in the drill hole database for the previous Makwa Mineral Resource estimate by Wardrop (Purchased by Tetra Tech in 2009) in 2007.

### ***2008 DRILLING***

Between the September 2007 Mineral Resource estimate and its subsequent update by Micon in 2009, Mustang completed 49 drill holes at the Makwa property for a total of 11,337 m.

During this period Mustang also undertook a program of additional assaying of existing but previously unsampled drill core from the western portion of the Makwa pit area, which included re-logging, sampling, and assaying of all historical drill holes potentially within the proposed Maskwa open pit mine envelope. Results from these drill core samples have been added to the database and used in the current Mineral Resource estimate.

### ***2009 – PRESENT***

Since the October 2009 Mineral Resource estimate, Mustang has completed ten additional holes bringing the total number of holes drilled at Makwa to 154 (Table 10-2).

**TABLE 10-2 MAKWA PROPERTY DRILLING SUMMARY 2004 TO 2010**  
**Mustang Minerals Corp. – Makwa-Mayville Property**

<b>Year</b>	<b>Holes</b>		<b>Drill Company</b>	<b>Lab</b>	<b>No of Holes</b>	<b>Total Meters</b>
2004	MM04-01	MM04-31	Rodren	Laboratoire Expert	31	5,330
2005	MM05-32	MM05-51	Rodren	Laboratoire Expert	20	3,541
2007	MM07-52	MM07-95	Rodren	Accurassay	44	8,577
2008	MM07-96	MM08-135	Rodren	TSL	40	8,532
2009	MM09-136	MM09-144	Rodren	Accurassay	9	2,805
2010	MM10-145	MM10-154	Rodren	Accurassay	10	1,839
	<b>Total</b>				<b>154</b>	<b>30,625</b>

### **DRILL CONTRACTOR**

Rodren Drilling Ltd. (Rodren) from West St. Paul, Manitoba, was contracted for the Canmine and Mustang drill programs. Imperial-length unit drill rods and a stabilized hexagonal core barrel were used to reduce hole deviation in most holes. The drill contractor retained by MNMCM is unknown. Most drill casing was pulled. Wood pickets with hole numbers on aluminum tape were left to mark the collar locations.

### **DRILL CORE SIZE**

The 1973 to 1976 MNMCM core is AXT diameter, which is approximately 32 mm. The Canmine core is BQ diameter, which is approximately 36 mm, and the Mustang core is NQ or approximately 48 mm in diameter.

### **COLLAR SURVEYS**

All of the Mustang drill holes have been spotted in the field using GPS and then surveyed after drilling was completed. Canmine surveyed all drill hole collars that were used in the Makwa deposit resource estimate. Five of the Canmine collars were surveyed by a professional surveyor in December 2004, together with 31 Mustang holes.

RPA assumes that approximately half of the MNMCM drill hole collars were surveyed because some holes have coordinates to two decimal places and others do not.

### **DOWNHOLE SURVEYS**

A Reflex EZ Shot Instrument was used by Mustang to measure drill hole dips and azimuths during its drilling programs. This instrument is affected by magnetics and suspect azimuth

readings are discarded. Readings are considered suspect if they deviate more than 15° from the previous reading. Suspect readings were not used in the resource estimation.

Canmine used acid dip tests. A Reflex Maxibor was used to obtain readings every 15 or 30 m down the hole in four Canmine holes (M-121, M-121W, M-123, and M-124). Maxibor uses an optical instrument that is unaffected by magnetics. The Maxibor survey was contracted to Borinfo Inc. of Sudbury, Ontario.

The MNM drill logs have dip acid tests noted.

### **CORE RECOVERY**

Core recovery data typically were not recorded in drill logs in the past diamond drill programs. Based on RPA's examination of the Mustang and Canmine drill core, the core recovery is excellent overall and likely averages in the 95% to 99% range. Some local intervals with poor core recovery are generally associated with fault zones. RPA recommends that Mustang take core recovery and rock quality designation (RQD) measurements in all future resource related drill holes.

### **DRILL CORE LOGGING**

A review of the historical logs indicates that, in most cases, the logs are complete and of good quality. All drill core was logged in detail in the field, with lithologic, structural, mineralogic, and alteration characteristics reported on standardized logging sheets. Ongoing plots were maintained throughout the exploration program, including cross sections of drill holes and longitudinal sections. Mustang uses a hand held magnetic susceptibility metre and 10% hydrochloric acid to assist in core logging.

The MNM, Canmine, and Mustang drill logs include sulphide and magnetite abundance estimates and core angle information in the descriptive text. RPA recommends that Mustang record sulphide abundance estimate values for each sample on the sampling worksheets and add a separate worksheet for core angle data, faults, and other data that may assist correlation work on the digital drill sections.

The holes were drilled at angles ranging from approximately -45° to -75°. The angle was chosen by the geologist with consideration of the expected dip of stratigraphy as well as the

proposed depths of the drill holes, the anticipated ground conditions, and limitations of drilling equipment.

Mustang has retained the lithologic nomenclature of the main units used in the past, although the BRS sub-unit nomenclature has varied. Visually distinctive lithological marker horizons, other than the sulphide mineralization layers, are generally absent in the sill. The detailed sill stratigraphy is not easily discernible visually and it may not be identifiable chemically either. More work on the sill stratigraphy details might prove useful, particularly to assist correlation in areas where multiple sulphide layers are present.

### **CORE STORAGE AND SECURITY**

Mustang has the drill logs for all of the holes drilled on the Dumbarton and Makwa deposits and for most of the drill holes drilled elsewhere on the property. The Mustang core is stored on core racks and is locked in the core storage facility on the property. The Canmine core is stored on covered pallets and core racks outside in a safe location well away from the main gate. Some of the MNCM drill holes are preserved at the Manitoba government core storage facility.

## MAYVILLE

### SUMMARY

Since the early 1920s, 221 surface diamond drill holes totalling approximately 43,000 m in length have been completed on the Property (Table 10-3). The drill logs and assay data for holes drilled prior to 1956 have been lost. Drilling from 1956 to 1990 was managed by Falconbridge, and has variable levels of detail. The majority of the drilling on the property was completed by Mustang between 2005 and 2013.

**TABLE 10-3 MAYVILLE PROPERTY DRILLING SUMMARY**  
Mustang Minerals Corp. - Mayville Property

Company Name	Year	Holes	Metres
Smith and Travers Company Ltd. (C1 to C8)	1923	8	558
Consolidated Mining and Smelting Company (C9 to C12)	1928	4	1,347
Gods Lake Gold Mines Ltd. (G1 to G9)	1944	9	unknown
MNCM/Falconbridge (M-1 to M-10)	1956	10	859
MNCM/Falconbridge (M-11 to M-14)	1980	4	218
MNCM/Falconbridge (M-15 to M-17)	1988	3	300
MNCM/Falconbridge (M-18 to M-21)	1990	4	822
Exploratus Elementis Diversis Ltd	1995	4	459
Mustang	2005	37	7,203
Mustang	2006	39	9,080
Mustang	2011	32	5,811
Mustang	2012	40	13,429
Mustang	2013	17	3,262
<b>Total Diamond Drilling</b>		<b>221</b>	<b>~43,000</b>

As of November 27, 2013, a total of 120 holes for 27,400 m had been drilled at or in the vicinity of the M2 Deposit. Most drill holes are inclined holes drilled toward the north and aligned along north-south oriented sections spaced 50 m apart (Figure 10-2). The lengths range from 93 m to a maximum of 993 m for an average of 250 m. The average drill hole spacing is approximately 50 m. The angle of the holes, ranging from  $-40^{\circ}$  to  $-90^{\circ}$ , was chosen by the geologist with consideration of the expected dip of stratigraphy, the proposed depths of the intercept, the anticipated ground conditions, and limitations of drilling equipment.



The 17 holes totalling 3,262 m drilled by Mustang in 2013 were not included in the resource database for the resource model. Several of these holes were drilled in or near the resource area. RPA reviewed these holes in section and level plan and confirmed that they would have only a minor impact on the local grade estimate and that overall the previous block model is still valid and current.

In RPA's opinion, there are no drilling, sampling, or drill core recovery factors that would materially impact on the accuracy and reliability of the results.

### **HISTORICAL DRILLING**

RPA reviewed some historical data to determine if they are suitable to include in the Mineral Resource estimate process. Most of the drill casings have been removed from the historical holes and, therefore, the locations and orientations of these drill holes could not be verified in the field.

Holes drilled in 1956 (M-1 to M-6, and M-10) were excluded from the Mineral Resource estimation process due to unreliable location data and incomplete sampling. Location data for these holes are considered unreliable due to uncertain conversion methods between local grid coordinates to real-world coordinates (e.g., Universal Transverse Mercator, UTM). The assay data in these holes are also of limited use in the preparation of a Mineral Resource estimate since the sampling is incomplete in areas of sulphide mineralization. Data available for holes M-11, C-1, and C-2 also have incomplete sampling and questionable collar locations, and therefore these holes were also removed from the modelling process.

RPA notes that drill holes excluded from the Mineral Resource modelling process all describe mineralized material over significant widths. This indicates that there are no significant disruptions or breaks in the mineralization in the areas of these excluded holes and that it is fair to interpret the mineralized material through or near these holes.

Holes drilled by Falconbridge from 1988 and later (M-15 to M-19 and M-21) have more accurate collar location data and more complete sampling data than the previous drilling. These holes provide additional data to the Mustang drilling and were included in the estimation of Mineral Resources at the M2 Deposit.

## MUSTANG DRILLING

Mustang conducted drill programs in 2005 to 2006 and 2011 to 2012, for a total of 148 holes for 35,523 m. Significant mineralization was intercepted in Mustang's first hole in 2005, with 0.28% Ni and 0.83% Cu from 6 m to 46 m down hole. RPA estimates the true width of that intersection to be approximately 37 m. Representative mineralized intersections are summarized in Table 10-4. Assays were cut to the following levels prior to compositing to the intervals listed below: 2.5% Cu, 1.5% Ni, 400 ppb Au, 350 ppb Pt, and 700 ppb Pd. Estimated true thickness was calculated using an average strike direction of 070° and an average dip of -66° to the south-southeast.

**TABLE 10-4 REPRESENTATIVE DRILL HOLE INTERSECTIONS, MAYVILLE PROPERTY**

**Mustang Minerals Corp. – Mayville Property**

HOLE-ID	From (m)	To (m)	Core Length (m)	Estimated True Thickness (m)	Ni (%)	Cu (%)	Au (ppb)	Pt (ppb)	Pd (ppb)	Zone
M-18	114.79	131.89	14.66	14.76	0.14	0.45	0.0	85.9	163.7	EZ_A
May06-43	74.77	97.87	23.10	20.69	0.20	0.61	105.5	82.5	171.5	EZ_A
M-16	36.21	43.07	6.22	6.27	0.30	0.89	155.7	65.4	254.8	EZ_B
May06-44	130.95	139.94	8.99	7.95	0.16	0.52	86.7	40.9	99.8	EZ_B
May06-43	32.93	41.77	8.84	7.90	0.18	0.56	161.5	72.4	122.0	EZ_C
May05-07	181.10	201.82	20.72	17.86	0.29	0.69	65.1	38.6	185.4	FW
May05-18	65.25	81.40	16.15	13.56	0.15	0.41	35.2	36.6	134.8	FW
May05-20	265.85	276.52	10.67	9.68	0.14	0.37	51.3	28.9	110.9	FW
May05-32	141.54	154.57	13.03	11.39	0.16	0.30	39.7	66.4	118.2	FW
May06-73	203.35	266.16	62.81	60.60	0.21	0.31	27.6	48.0	130.2	FW
May12-139	346.87	361.00	14.13	11.01	0.13	0.41	32.6	50.3	152.7	FW
May12-57	330.74	368.56	37.82	31.87	0.33	0.75	66.0	73.1	201.6	FW
M-15	64.50	111.00	46.45	42.52	0.15	0.37	65.3	78.2	123.7	MZ
May05-12	149.24	200.30	51.06	39.68	0.18	0.40	48.3	50.9	146.7	MZ
May05-19	52.81	108.84	56.03	27.40	0.16	0.37	38.6	38.3	130.5	MZ
May05-20	207.93	261.28	53.35	48.39	0.19	0.46	53.7	41.7	149.3	MZ
May05-26	46.34	78.35	32.01	29.45	0.18	0.44	51.2	43.9	140.7	MZ
May05-27	63.10	73.78	10.67	7.51	0.17	0.45	78.3	42.3	75.9	MZ
May05-31	174.39	182.53	8.14	7.38	0.20	0.51	50.1	62.0	227.4	MZ
May05-33	18.90	70.64	51.74	40.80	0.18	0.42	54.3	46.1	139.7	MZ
May05-34	120.72	140.08	19.36	15.87	0.19	0.67	57.0	25.6	129.4	MZ
May06-54	111.89	136.28	24.39	21.68	0.21	0.63	67.7	39.1	96.5	MZ
May06-55	208.38	236.89	28.51	25.27	0.17	0.34	40.9	49.7	133.8	MZ
May06-56	149.54	189.10	39.56	36.20	0.14	0.45	39.0	29.9	83.9	MZ
May06-59	68.28	93.60	25.32	22.10	0.18	0.36	49.5	39.8	130.7	MZ
May06-64	76.30	93.29	16.99	14.90	0.12	0.40	38.3	22.3	94.6	MZ
May06-65	208.54	215.55	7.01	6.36	0.25	0.72	82.1	67.2	243.4	MZ



HOLE-ID	From (m)	To (m)	Core Length (m)	Estimated True Thickness (m)	Ni (%)	Cu (%)	Au (ppb)	Pt (ppb)	Pd (ppb)	Zone
May06-73	185.88	200.30	14.42	13.91	0.17	0.41	40.8	44.3	116.7	MZ
May06-74	207.00	232.32	25.31	22.74	0.22	0.38	57.1	51.5	128.9	MZ
May12-138	309.00	337.00	28.00	24.71	0.14	0.33	33.2	51.6	122.6	MZ
May12-41	407.70	426.00	18.30	13.60	0.12	0.40	38.5	55.4	135.0	MZ
May12-43	356.00	400.75	44.75	34.01	0.15	0.47	113.9	34.9	143.2	MZ
May12-49	197.00	209.50	12.50	10.08	0.14	0.46	57.0	38.6	143.4	MZ
May12-56	240.68	269.00	28.32	25.40	0.18	0.46	35.3	56.5	140.2	MZ

Notes: MZ=Main Zone, FW=Footwall Zone, EZ\_A= East Zone A, EZ\_B= East Zone B, and EZ\_C= East Zone C.

## DRILL CONTRACTOR

Rodren Drilling Ltd. (Rodren) of West St. Paul, Manitoba, was contracted for most of the Mustang drill programs. Bodnar Drilling of St. Rose, Manitoba was used for the 2011 drilling. The 2011 drill program used imperial unit rods. Rodren used Imperial length drill rods during the 2005-2006 drill programs while metric rods were used during the 2012 drill programs. A stabilized hexagonal core barrel was also used in some holes to reduce hole deviation. The drill casings were left in all holes. Wood pickets with the hole numbers written on aluminum tape to identify the drill collars were placed at each drill hole once drilling activities were completed.

Rodren also drilled the 1990 holes for Falconbridge. Drilling for holes M-15 to M-17 was done by Cancor Drilling Ltd. of Vancouver, B.C. Drilling in 1980 was contracted to Midwest Drilling, Winnipeg, Manitoba. Drill contractors used prior to 1980 are unknown.

## DRILL CORE SIZE

All drill core for the Mustang programs is NQ size, or approximately 48 mm in diameter. Core size used by Falconbridge varied from program to program as follows:

- 1956: holes M-1 to M-10 – E size (22 mm)
- 1980: hole M-11 – BQ (37 mm)
- 1988: holes M-15 to M-17 – AX (32 mm)
- 1990: M-18, M-19, and M-21 – BQ (37 mm)

## **COLLAR SURVEYS**

All of the Mustang drill hole collars were initially surveyed using hand-held GPS by Mustang staff. Once the drilling activities were complete, they were surveyed by Pollock & Wright Land Surveyors of Winnipeg, Manitoba, using Dual Frequency GPS measurements processed in concert with the Geodetic Survey of Canada's ACP station in Lac du Bonnet. Data for the collar locations was provided in NAD83, Zone 15.

Some of the Falconbridge drill hole collars were located and also surveyed using differential GPS. The locations for the remaining Falconbridge holes in the new grid coordinate system were measured from a scanned, geo-referenced Falconbridge map that only showed local grid coordinates that were used at that time. Mustang personnel geo-referenced the Falconbridge map to a topographic map in UTM coordinates using topographic features.

## **DOWNHOLE SURVEYS**

Downhole surveys on the Mustang holes were generally completed by the drilling company using a Reflex EZ Shot instrument to take dip and azimuth readings in most drill holes every 100 m to 200 m. The Reflex EZ Shot is affected by magnetic rocks and Mustang discarded a number of suspect azimuth readings.

Falconbridge conducted acid dip tests approximately every 30 m and the collar azimuth was assumed to the toe of each hole.

## **CORE RECOVERY**

Core recovery data was not recorded in the 2005-2006 Mustang or Falconbridge drill logs. Based on examination of the Mustang drill core, it is RPA's opinion that core recovery is excellent overall and likely averages in the 95% to 99% range. Some local intervals with poor core recovery are generally associated with fault zones. During the 2012 drill program, Mustang implemented a program in which rock quality designation (RQD) and magnetic susceptibility measurements were collected from all drill core.

## **CORE RETRIEVAL AND TRANSPORTATION**

Mustang core was placed within marked core boxes as per industry standards by the drill crew, with depth markers placed at regular intervals. The drill core was then transported to the warehouse at Mustang's Makwa Mine Lease by Mustang or the drilling company

personnel twice daily, at the driller's shift change. Upon arrival, the core boxes were opened and a preliminary review of the hole including length, geology, and mineralization was made (possibly with Niton readings of visible sulphides) by a Mustang geologist.

### **DRILL CORE LOGGING**

A review of the drill logs by RPA indicates that the drill hole logs are complete and of good quality. All Mustang drill core was logged in detail in the field, with lithologic, structural, mineralogic, and alteration characteristics reported as both descriptions and in a coded format. Mustang uses a hand-held magnetic susceptibility meter and 10% hydrochloric acid to assist in core logging. Drill core is photographed both dry and wet.

The Falconbridge and Mustang drill logs include sulphide and magnetite abundance estimates in the descriptive text. RPA recommends that Mustang record sulphide abundance estimate values for each sample on the sampling worksheets and add a separate worksheet for core angle data, faults, and other data that may assist correlation work on the digital drill sections.

### **CORE STORAGE AND SECURITY**

Drill core from the Mustang drilling is stored on core racks in a locked core storage facility at the Makwa Mine site, 35 km to the south. Mustang was unable to locate any drill core from the previous programs.

# 11 SAMPLE PREPARATION, ANALYSES AND SECURITY

## MAKWA

### SAMPLE PREPARATION AND ANALYSIS

Sample intervals ranged from 6 cm (0.2 ft) to 1.8 m (6 ft), with the majority of samples at intervals of 1.5 m (5 ft) (Wardrop, 2008).

Drill core was moved directly from the drill site to the on-site warehouse at the drillers' shift change, twice a day. The warehouse is locked and secure when unattended. The core was logged and marked for sampling by the geologist. The geologist clearly displayed the interval to be sampled with tags. The sample numbers and intervals were recorded on the logging sheet and digitally immediately following core analysis. Standards, duplicates, and blanks were inserted within the sampled intervals as part of the quality assurance/quality control (QA/QC) program.

Core samples were sawn lengthwise using a diamond saw. One-half of the core was bagged, tagged, stapled and completely sealed, and the other half of the core was retained for future reference. The saw was routinely cleaned between samples. The samples were immediately transported by company personnel directly to the Greyhound Bus Station in Lac du Bonnet where they were shipped for assay to Accurassay in Thunder Bay, Ontario. The remaining drill core was stored on racks at Mustang's on-site technical facility.

### **MNCM SAMPLES**

MNCM samples were analyzed for nickel and cobalt by an unknown assay laboratory. Canmine calculated cobalt, platinum, and palladium values for the MNCM samples in the Borsurv database using regression analysis.

### **CANMINE SAMPLES**

A total of 689 Canmine samples were analyzed for nickel, copper, cobalt, platinum, and palladium by TSL Laboratories (TSL) in Saskatoon (Harper, 2004). TSL prepared the samples according to standard industry practice and Evans, 2005 reported that the pulps remained stored at the facilities in Saskatoon.

**MUSTANG SAMPLES**

Prior to the 2007 program, Mustang submitted its samples to be analyzed for nickel, copper, cobalt, gold, platinum and palladium by Laboratoire Expert Inc. (Laboratoire Expert) in Rouyn-Noranda, Quebec. In 2008, Mustang submitted its samples to TSL prior to reverting back to Accurassay in 2009 and 2010.

All samples from the 2007, 2009, and 2010 programs were analyzed for nickel, copper, cobalt, iron, gold, platinum, and palladium by Accurassay in Thunder Bay. In addition, analysis for a further suite of 30 elements was carried out for silver, aluminum, arsenic, boron, barium, beryllium, bismuth, calcium, cadmium, chromium, potassium, lithium, magnesium, manganese, molybdenum, sodium, phosphorus, lead, sulphur, antimony, selenium, silicon, tin, strontium, titanium, thallium, vanadium, tungsten, yttrium, and zinc.

The rock samples were first entered into the Accurassay Local Information Management System (LIMS). The samples were dried, if necessary, and then jaw crushed to approximately 8 mesh and a 250 g to 500 g sub-sample was taken. The sub-sample was pulverized to 90% minus 150 mesh and then matted to ensure homogeneity. Silica sand was used to clean the pulverizing dishes between each to prevent cross contamination. The homogeneous sample was then sent to the fire assay laboratory or the wet chemistry laboratory depending on the analysis required.

A fire assay with atomic adsorption (AA) finish process was used for the analysis of precious metals (gold, platinum, palladium, and/or rhodium). The sample was mixed with a lead-based flux and fused for one hour and 15 minutes. To each sample, a silver solution was added prior to fusion, which allowed each sample to produce a precious metal bead after cupellation. The fusing process result was a lead button that contained all of the precious metals from the sample as well as the silver that was added. The button was then placed in a cupelling furnace where all of the lead was absorbed by the cupel and a silver bead, which contained any gold, platinum, and palladium, was left in the cupel. The cupel was removed from the furnace and allowed to cool. Once the cupel had cooled sufficiently, the silver bead was placed in an appropriately labelled test tube and digested using aqua regia. The samples were bulked up with 1.0 mL of distilled de-ionized water and 1.0 mL of 1% digested lanthanum solution. The samples were allowed to cool and were mixed to ensure proper homogeneity of the solution. Once the samples had settled, they were analyzed for gold, platinum, and palladium using atomic absorption spectroscopy. The atomic absorption

spectrometer unit was calibrated for each element using the appropriate International Standards Organization (ISO) 9002 certified standards in an air-acetylene flame. The results for the atomic absorption were checked by the technician and then forwarded to data entry by means of electronic transfer and a certificate was produced. The laboratory manager checked the data and validated the certificates and issued the results in the client requested format.

Samples analyzed for copper nickel, cobalt, lead, zinc, and silver were weighed for geochemical analysis and digested using aqua regia. The samples were bulked to a final volume and mixed. Once the samples had settled, they were analyzed for copper, nickel, and cobalt using atomic absorption spectroscopy. The atomic absorption spectrometer was calibrated for each element using the appropriate ISO 9002 certified standards in an air-acetylene flame. The results for the atomic absorption were checked by the technician and then forwarded to data entry by means of electronic transfer and a certificate was produced. The laboratory manager checked the data and validated the certificates and issued the results in the client requested format.

Accurassay employs an internal quality control system that tracks certified reference materials (CRM) and in-house quality assurance standards. Accurassay uses a combination of reference materials, including those purchased from the Canada Centre for Mineral and Energy Technology (CANMET), standards created in-house by Accurassay and tested by round robin with laboratories across Canada, and ISO-certified calibration standards purchased from suppliers. Should any of the standards fall outside the warning limits (+2 standard deviations, 2SD); re-assays will be performed on 10% of the samples analyzed in the same batch and the re-assay values are compared with the original values. If the values from the re-assays match original assays, the results are certified; if they do not match, the entire batch is re-assayed. Should any of the standard fall outside the control limit (+ 3SD), all assay values are rejected and all of the samples in that batch will be re-assayed.

At Laboratoire Expert in Rouyn-Noranda, silver and cobalt were determined by partial digestion atomic absorption on a 0.50 g sample at a detection limit of 0.2 ppm for silver and 2 ppm for cobalt. Copper and nickel were determined by total digestion atomic absorption (AA) on a 0.50 g sample. The detection limit was 0.01% for copper and nickel. Silver, platinum, and palladium were determined by fire assay-AA finish with a standard 29.166 g sample weighed into a crucible that had been previously charged with approximately 130 g of flux.

The sample was then mixed and 1 mg of silver nitrate solution was added. The sample was then fused at 1,800°F for approximately 45 minutes. The sample was then poured in a conical mold and allowed to cool; after cooling, the slag was broken off and the lead button weighing 25 g to 30 g was recovered. This lead button was then cupelled at 1,600°F until all the lead was oxidized. After cooling, the residual metal bead was placed in a test tube. The beads were digested and gold, platinum, and palladium were determined by inductively coupled plasma mass spectrometry (ICP-MS). The detection limits were 2 ppb for gold, 5 ppb for platinum, and 4 ppb for palladium.

### **ASSAY QUALITY CONTROL AND QUALITY ASSURANCE**

QA/QC procedures have included comparison of analytical results with drill logs, using reference standards and blanks, and verifying analytical results with an external laboratory.

#### ***MUSTANG QUALITY ASSURANCE/QUALITY CONTROL***

A regular system of assay standards, duplicates, and blanks has been employed by Mustang and Accurassay. About 10% of the samples have been repeated by Accurassay. Five percent of the samples submitted have been duplicated by Mustang. In addition, about 2.5% of the samples submitted by Mustang have consisted of commercial standard assay material (Standards 13P and 14P), and about 2.5% consisted of blank material.

During the fall 2004 drilling program, Mustang inserted approximately one blank and one commercial reference standard per batch of samples for most drill holes from MM04-17 to MM04-31 (Evans, 2005). It analyzed 12 blanks and 12 standards in total for the 376 samples, an insertion rate of approximately 6%.

Blanks or standards were not used for the 2004 summer drilling of holes MM04-01 to MM04-16. However, 45 sample rejects were sent to Lakefield Research Ltd. (now SGS Mineral Services) from these drill holes (Evans, 2005). Lakefield analyzed the 45 rejects and averaged slightly higher nickel, copper, cobalt, platinum, and palladium. The average grade of these rejects was similar to the historical resource estimate grade. Some 29 of the 45 samples had gold grades below the Lakefield detection limits (<20 ppb), making it impossible to compare with the 5 ppb Au detection limit analyses by Laboratoire Expert. The Makwa deposit contains approximately 30 ppb Au. The external checks indicate that the Laboratoire Expert analyses are reasonable, and even slightly conservative, for nickel, copper, cobalt, platinum, and palladium.

Four commercial nickel sulphide reference standards from Geostats Pty Ltd in Australia were used to cover a reasonable range of nickel and copper grades (Evans, 2005). These results also suggested that the Laboratoire Expert data might slightly understate nickel and copper. The results of the blanks did not indicate any significant sample contamination.

A second external check of the Laboratoire Expert analyses was completed; 59 sample rejects were sent to ALS Chemex (Evans, 2005). The ALS Chemex analyses averaged slightly higher for nickel, copper, and cobalt, and slightly lower for platinum, palladium and gold. The Laboratoire Expert assays are acceptable based on the reference standard results and the external check assays at Lakefield and ALS Chemex (Evans, 2005).”

The QA/QC procedures from the 2007 and 2008 programs were slightly modified for the 2009 drilling campaign and consisted of insertion of a QA/QC sample after every tenth sample according to the following sequence:

- 10-blank;
- 20-duplicate;
- 30-Std;
- NI 117;
- 40-duplicate;
- 50-blank;
- 60-duplicate;
- 70-Std NI 113;
- 80-duplicate;
- 90-blank; and
- 100-duplicate.

The results of the blank sample assaying for nickel, copper, total platinum group metals (PGM), and cobalt are presented in Figures 11-1, 11-2, 11-3, and 11-4, respectively.



FIGURE 11-1 BLANK SAMPLE RESULTS – NICKEL, MAKWA PROPERTY

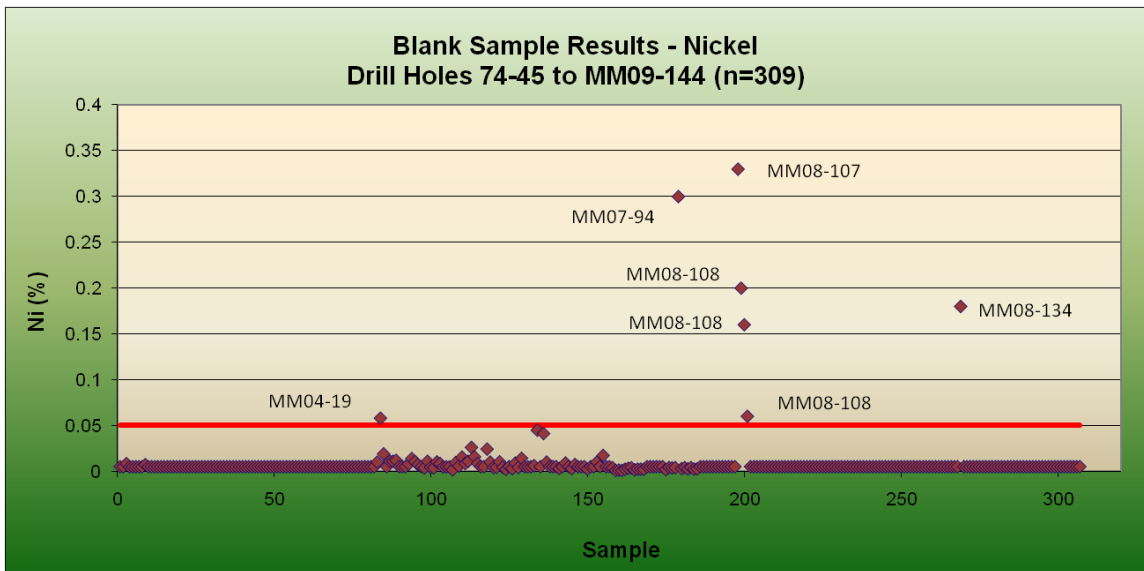
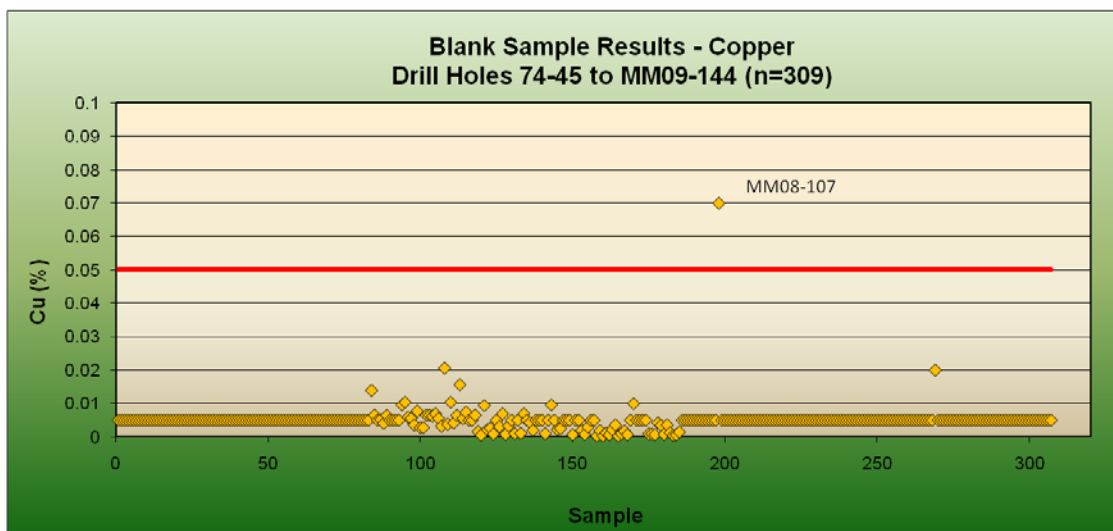
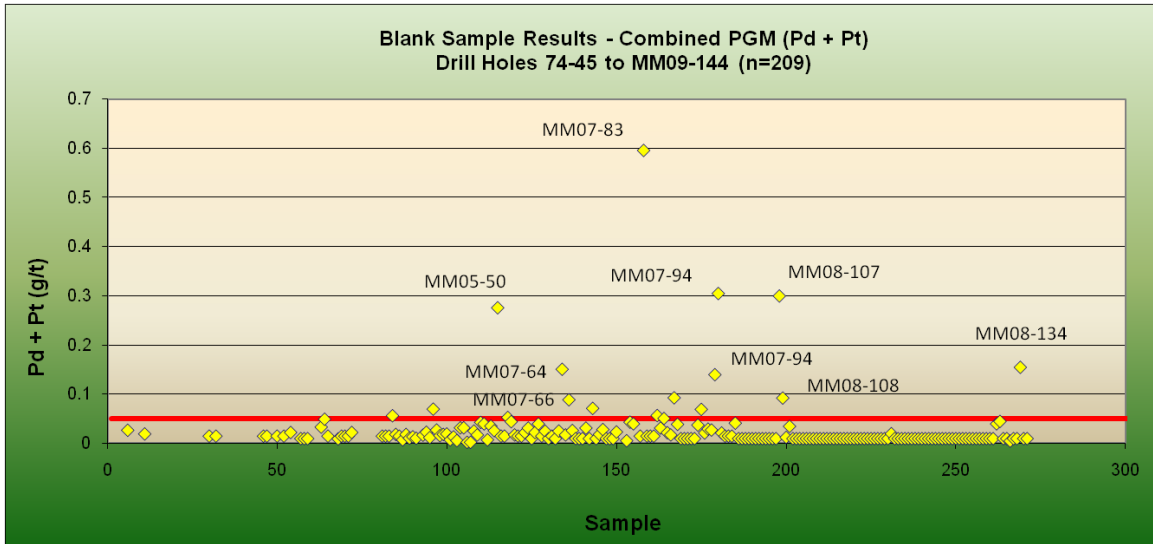


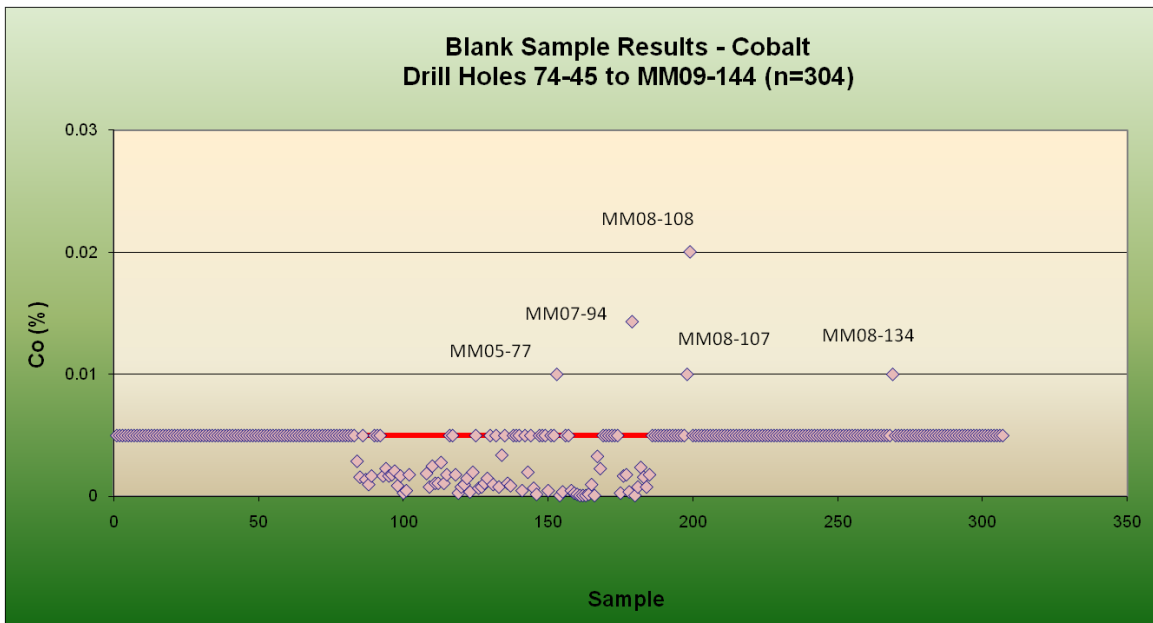
FIGURE 11-2 BLANK SAMPLE RESULTS – COPPER, MAKWA PROPERTY



**FIGURE 11-3 BLANK SAMPLE RESULTS - COMBINED PGM, MAKWA PROPERTY**



**FIGURE 11-4 BLANK SAMPLE RESULTS – COBALT, MAKWA PROPERTY**



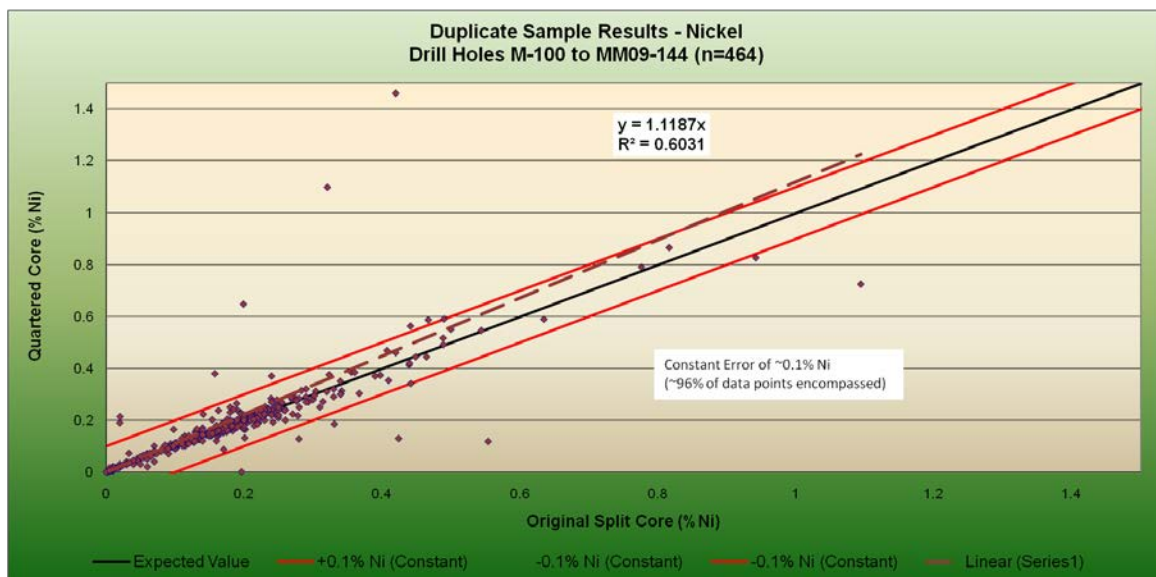
It can be seen that seven samples contained within the nickel blank sample series are observed to contain elevated nickel values above a notional acceptance limit of 0.05% Ni. One sample contained within the copper blank sample series is observed to contain elevated copper values above the notional acceptance limit of 0.05% Cu. In respect of the combined PGM blank samples, 14 are seen to exceed a notional acceptance threshold of 0.05 g/t

Pd+Pt. Five samples contained within the cobalt blank sample series are seen to exceed a notional acceptance threshold of 0.01% Co.

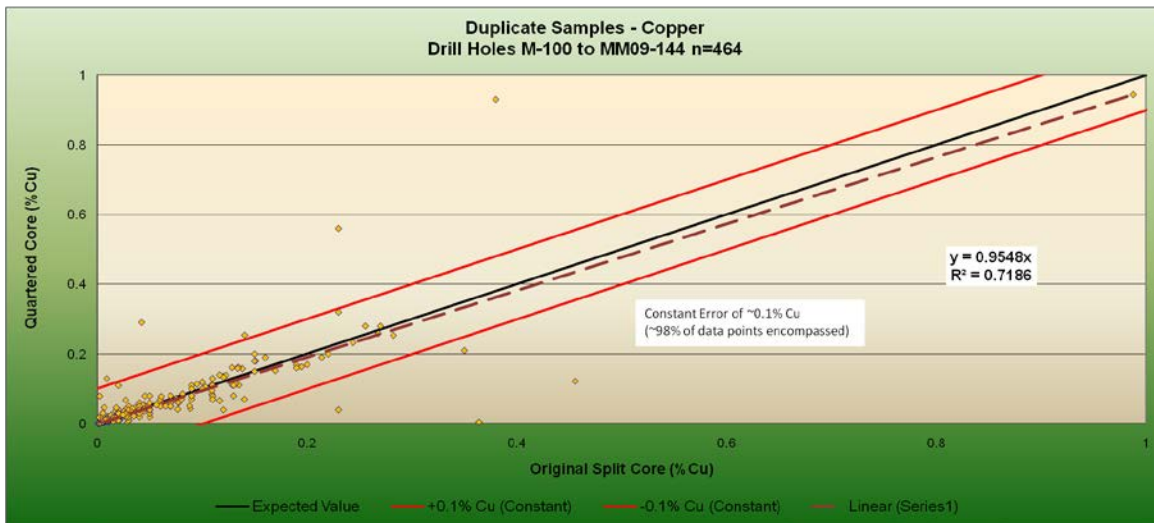
RPA recommends that a detailed study, which examines the potential impact of the blank samples containing elevated metal values, be undertaken. Such a study would review the position of these out-of-bounds blank samples within the database relative to the mineralized intervals. Re-assaying of all samples contained within the batch associated with these out-of-bounds samples is warranted for all samples contained within the mineralized domain models.

The results of the duplicate sampling program for nickel, copper, total PGM (Pd+Pt), and cobalt are presented in Figures 11-5 through 11-8, respectively. It can be seen that the results of these duplicate samples display a good correlation in respect of sample bias and dispersion.

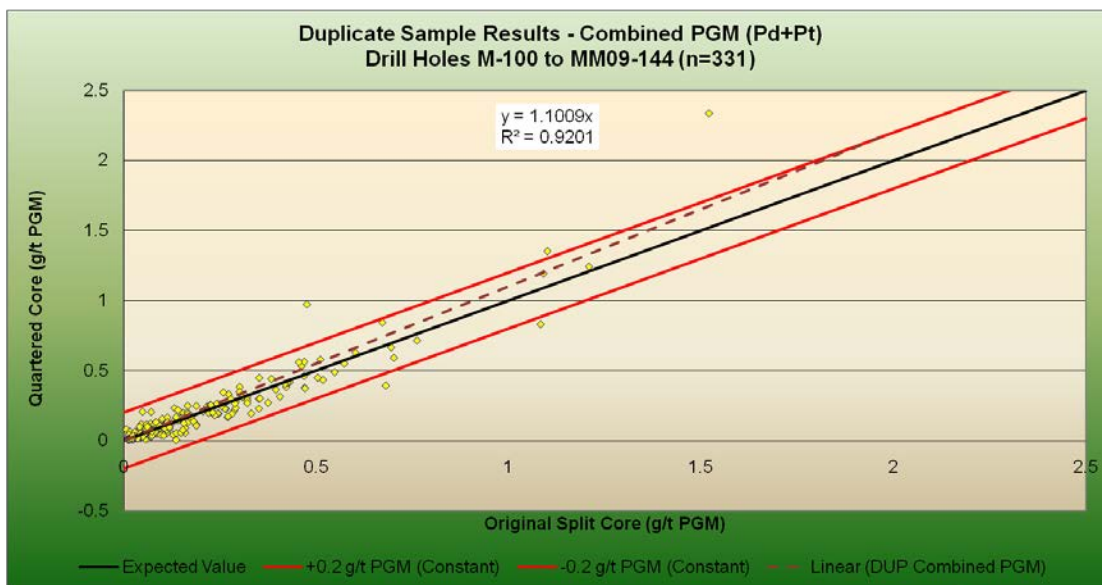
**FIGURE 11-5 DUPLICATE SAMPLE RESULTS – NICKEL, MAKWA PROPERTY**



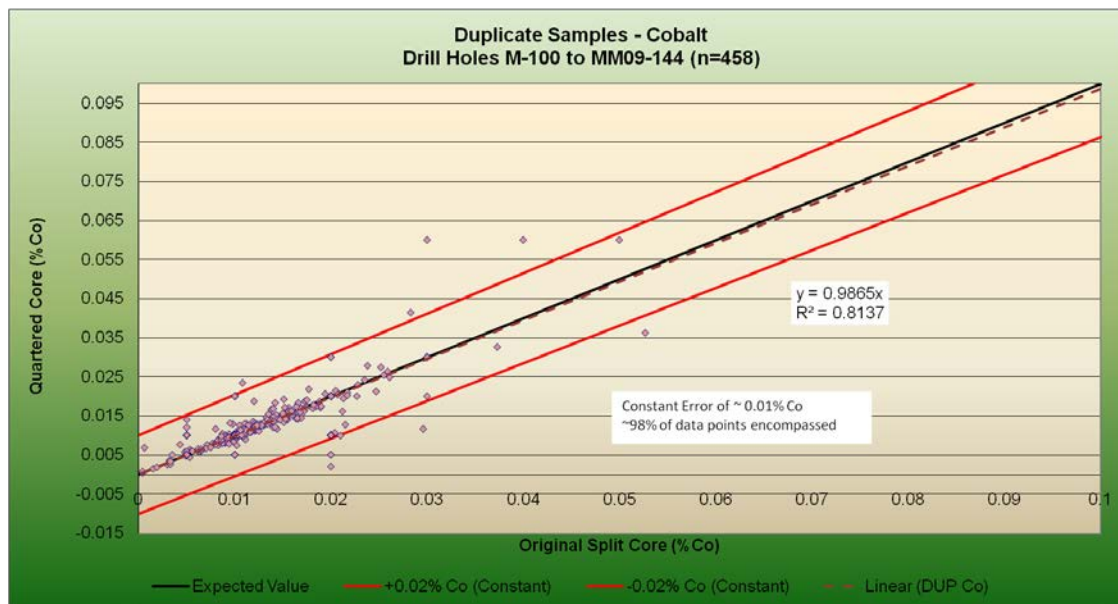
**FIGURE 11-6 DUPLICATE SAMPLE RESULTS – COPPER, MAKWA PROPERTY**



**FIGURE 11-7 DUPLICATE SAMPLE RESULTS - COMBINED PD + PT, MAKWA PROPERTY**



**FIGURE 11-8 DUPLICATE SAMPLE RESULTS – COBALT, MAKWA PROPERTY**



The control charts from assaying of selected CRMs (standards) for nickel and copper are presented in Figures 11-9 to 11-12. No CRMs were included in the sample stream in relation to assaying for palladium, platinum, or cobalt.

**FIGURE 11-9 CONTROL CHARTS FOR CRMS OREAS 13P AND 14P – NICKEL, MAKWA PROPERTY**

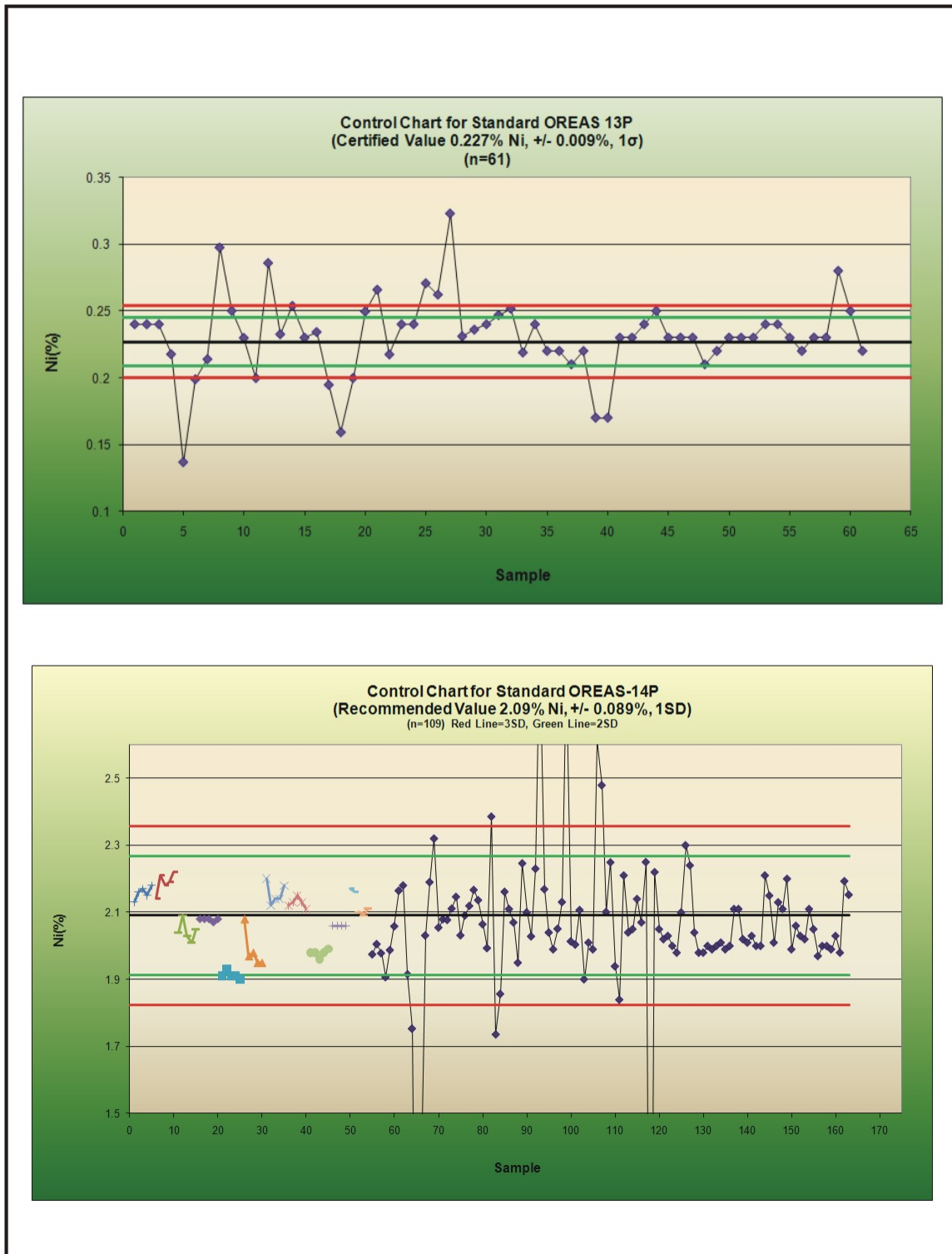
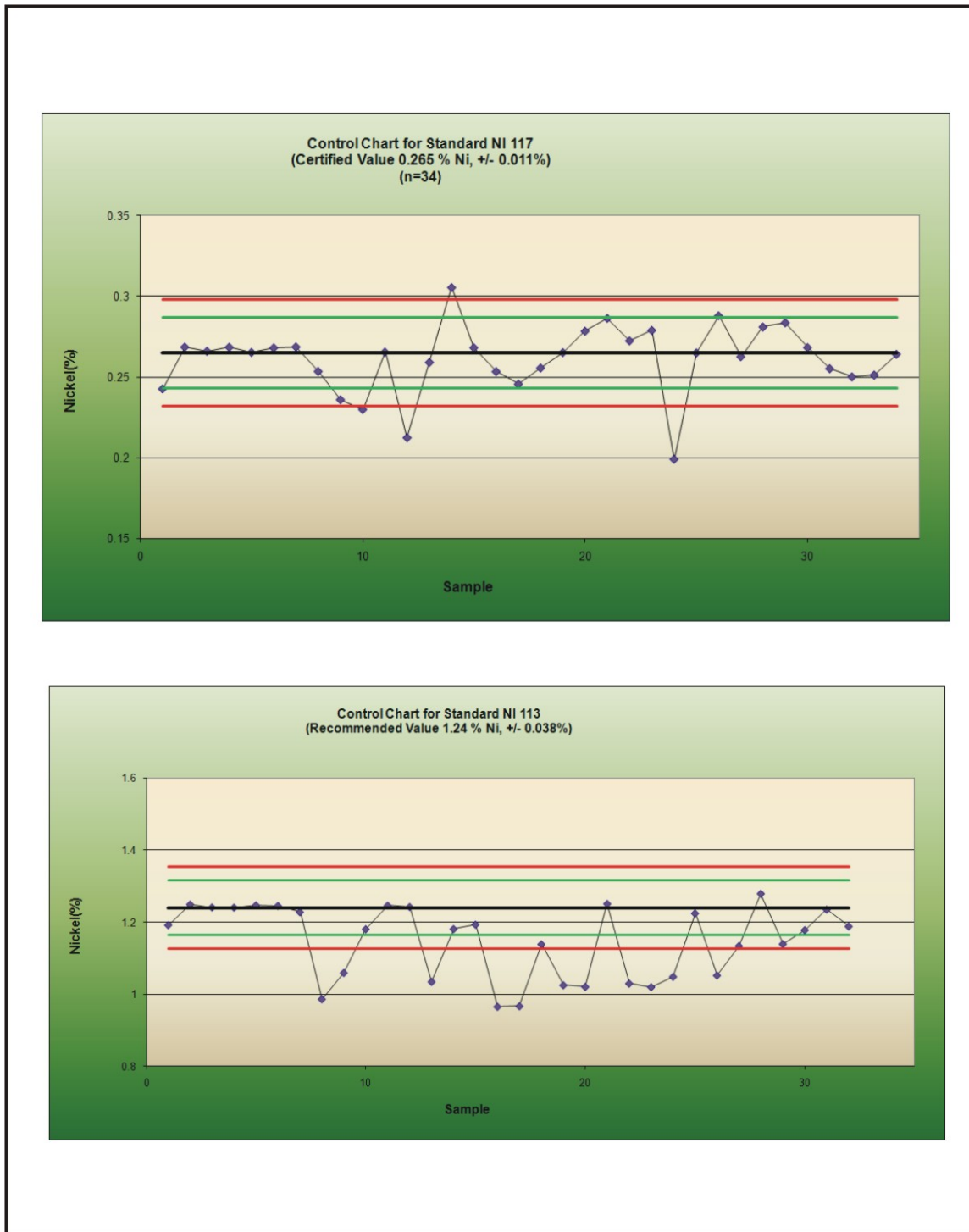
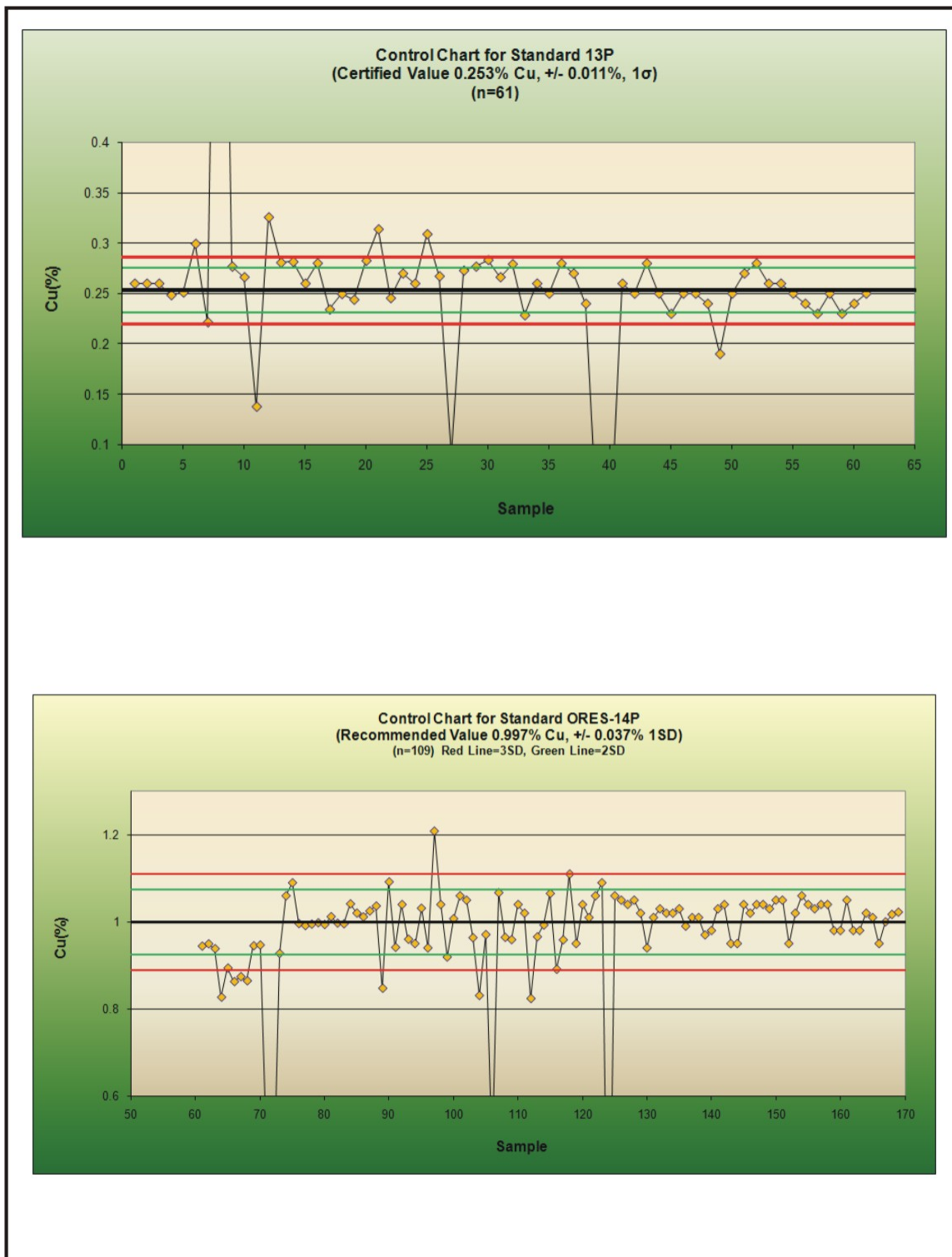


FIGURE 11-10 CONTROL CHARTS FOR CRMS NI 117 AND NI 113 – NICKEL, MAKWA PROPERTY

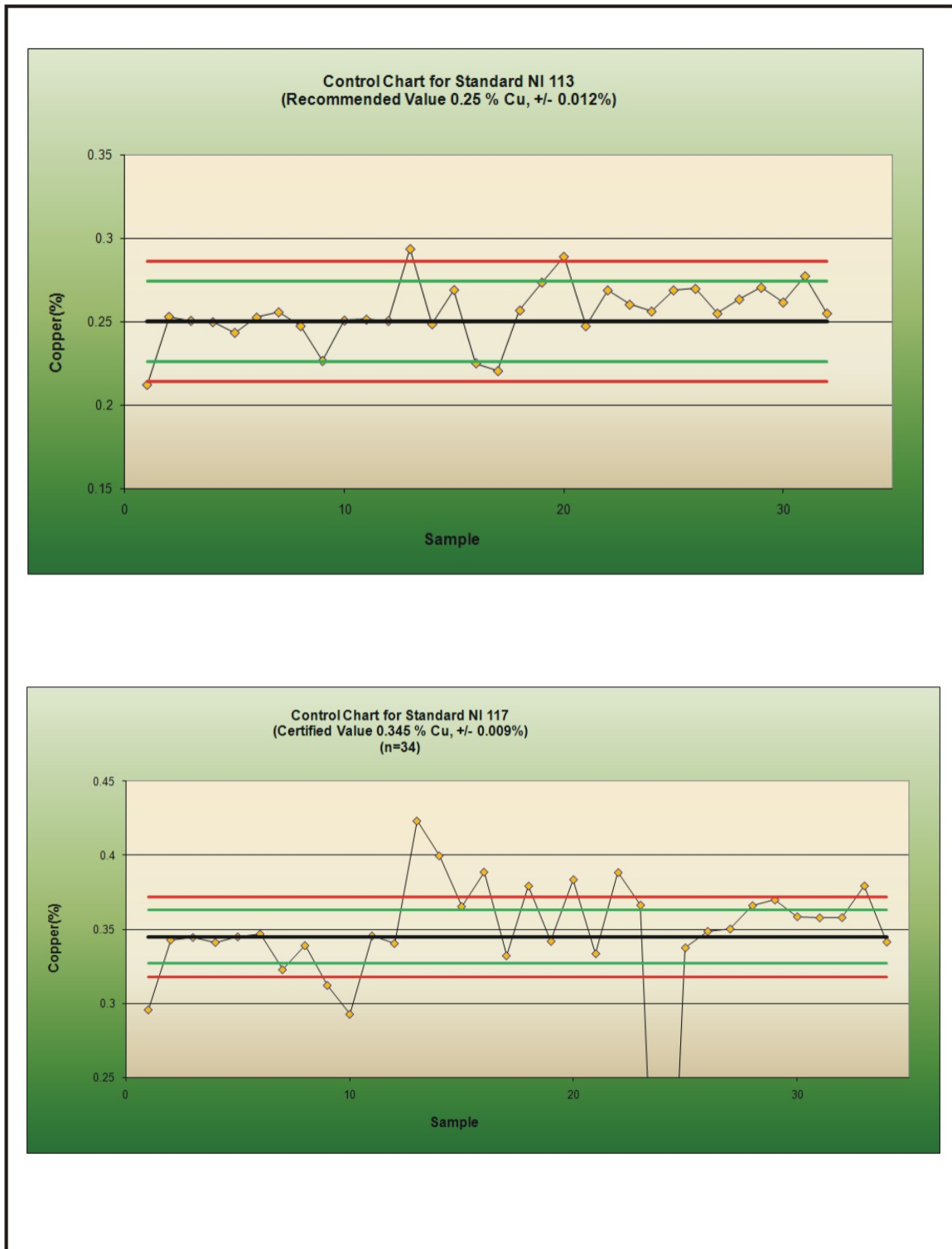


**FIGURE 11-11 CONTROL CHARTS FOR CRMS OREAS 13P AND 14P – COPPER, MAKWA PROPERTY**





**FIGURE 11-12 CONTROL CHARTS FOR CRMS NI 117 AND NI 113 – COPPER, MAKWA PROPERTY**



It can be seen that a number of failures are present where the analytical results of the CRMs fall both above and below the three standard deviation pass/fail criterion. RPA recommends that the individual failures be examined initially to ensure that they are not a result of transcription or other such errors at the data entry stage. A program of re-assaying of all samples relating to the failed batches is recommended.

#### **CANMINE QUALITY ASSURANCE AND QUALITY CONTROL**

Canmine did not conduct a formal check or re-assaying program on core from the Makwa Property (Evans, 2005). Results from TSL were given to field geologists to enter into the drill logs for comparison purposes and core samples were retained. Individual check assays or re-assays were completed on an as-needed basis to verify results between assays and visual estimates made during logging. Metallurgical testing results by Lakefield accord with assays completed by TSL (Evans, 2005).

#### **MAKWA NICKEL QUALITY ASSURANCE AND QUALITY CONTROL**

There is no information available on the QA/QC procedures of MNCM. The use of standards and blanks, replicate and duplicate analyses, and external checks were not standard industry practice in the 1970s, particularly for nickel-copper projects with relatively homogeneous disseminated sulphide mineralization.

### **SECURITY**

The core logging facility, core storage area, and the main gate to the Makwa Property are kept locked. Individual sample bags are sealed shut before shipping. RPA believes that Mustang has implemented proper security procedures at the Makwa Property.

In RPA's opinion, the sample preparation, security, and analysis procedures are appropriate for the Makwa mineralization and the results are adequate for use in a Mineral Resource estimate.

## **MAYVILLE**

### **SAMPLE PREPARATION**

The majority of the sample data set used for the Mineral Resource estimate was conducted under the Mustang drilling protocols, as described below. The sampling methods employed by Falconbridge in 1988 and 1990 are unknown, however, RPA believes that the sampling

was carried out in accordance with industry best practices of the time. No surface channel sampling is available and there has been no underground development.

Sample intervals are commonly kept to 1.5 m in length. Where necessary, sample intervals are determined by changes in mineralization, lithology, or structural breaks and can range from 0.07 m to 2.4 m. Sample numbers and intervals are recorded both on the logging sheet and digitally immediately following core examination. In 2005 and 2006, reference materials and blanks were inserted at random within the sampled intervals. In 2011 and 2012, QA/QC samples were submitted on a one in every ten samples basis.

A Mustang technician used a diamond saw to cut the core lengthwise where marked. The saw was cooled and cleaned with a continuous flow of fresh water. One half of the core was tagged and bagged, and the bag was then stapled and sealed. The remaining half of the core was retained and stored in racks within the warehouse for future reference.

Mustang personnel were not responsible for any sample preparation steps beyond sawing and bagging the samples. The bagged samples were transported by Mustang personnel directly to the Grey Goose Bus Station in Lac du Bonnet, Manitoba, where the 2005-2006 samples were shipped to Laboratoire Expert, and the 2012 samples were shipped to Accurassay for sample preparation and analysis. Accurassay is accredited according to ISO/IEC 17025 and CAN-P-1579 by the Standards Council of Canada (SCC). Laboratoire Expert is not accredited.

The drill hole database is regularly updated with collar locations, survey data, lithology, and analytical results. The database is stored on a laptop computer with regular back-ups taken and a master database created. A copy of the database is also stored in Discovery/MapInfo format.

#### ***LABORATOIRE EXPERT INC. (2005–2006)***

At Laboratoire Expert, samples were initially crushed to a quarter of an inch in a jaw crusher. The crusher was cleaned between each sample using compressed air. Samples were then crushed to 90% passing -10 mesh in a roll crusher. The first sample of each batch was screened at 10 mesh to determine if 90% of the sample passed through the sieve. If 90% did not pass, the roll crusher was adjusted and another test carried out. The roll crusher was cleaned between each sample using compressed air and a metal brush. A split of

approximately 300 g was separated using a Jones riffle splitter. The remaining reject material was returned to Mustang. The 300 g split was pulverized to 90% passing -200 mesh in a ring pulverizer. The pulverizer was cleaned between each sample using an air compressor and by running barren silica between each batch. The first sample of each batch was screened at -200 mesh. If 90% did not pass, the time of pulverization was increased and another test carried out.

#### ***ACCURASSAY LABORATORIES (2011–2012)***

Upon arriving at the laboratory, rock samples were entered into LIMS for sample tracking. The samples were then prepared by drying, jaw crushing to 70% <8 mesh, and a 250 g to 500 g sub-sample was taken for analysis. The sub-sample was pulverized to 85% <200 mesh and then matted to ensure homogeneity. The homogeneous sample was then sent to the fire assay laboratory or the wet chemistry laboratory depending on the analysis required. Non-silica based sand was used to clean the pulverizing dishes between each sample to prevent cross contamination.

## **ANALYSIS**

#### ***LABORATOIRE EXPERT INC. (2005–2006)***

Mineralized core samples were routinely analyzed for nickel, copper, and cobalt using total digestion followed by atomic absorption analysis. Gold, platinum, and palladium values in the nickel-mineralized lenses were determined by fire assay with an ICP-MS finish.

#### ***ACCURASSAY LABORATORIES (2011–2012)***

Samples analyzed for base metals (copper and nickel) were weighed for either a geochemical or mineralized material grade analysis, and digested using an aqua regia solution. The samples were bulked to a final volume and mixed. Once the samples had settled, they were analyzed for copper, nickel, cobalt, etc., using atomic absorption or ICP spectroscopy. The atomic absorption (air-acetylene flame) or ICP instrument was calibrated for each element using the appropriate ISO 9002 certified standards. The results for the instrumental analysis were checked by the technician and then forwarded to data entry by means of electronic transfer and a certificate was produced. The Laboratory Manager checked the data, validated the certificates, and issued the results in the client requested format. Samples that contained a grade of greater than 10,000 ppm were re-analyzed using an “ore” grade method, which is more appropriate for samples of higher than normal grade.

For the analysis of precious metals (gold, platinum, and palladium), each sample was mixed with a lead based flux and fused for an hour and fifteen minutes. A silver solution was added prior to fusion allowing each sample to produce a precious metal bead after cupellation. The fusing process resulted in lead buttons that contained the precious metals, as well as the added silver. The buttons were then placed in a cupelling furnace where the lead was absorbed by the cupels and a silver bead, which may also contain gold, platinum and palladium, was left in the cupel. After cooling, the silver bead from each cupel was digested using aqua regia. The samples were bulked up to 5 mL with a combination of distilled de-ionized water and a 1% digested lanthanum solution. The samples were allowed to cool and were mixed to ensure proper homogeneity of the solutions. Once the samples had settled, they were analyzed for gold, platinum, and palladium using atomic absorption or ICP spectroscopy.

In RPA's opinion, the sample preparation, security, and analysis procedures used by Laboratoire Expert and Accurassay are appropriate for the Mayville mineralization and the results are adequate for use in a Mineral Resource estimate.

## **QUALITY ASSURANCE AND QUALITY CONTROL**

Quality assurance (QA) consists of evidence to demonstrate that the assay data has accuracy and precision within generally accepted limits for the sampling and analytical methods used, and thus provides confidence in the resource estimation. Quality control (QC) consists of procedures used to ensure that an adequate level of quality is maintained in the process of sampling, preparing, and assaying the samples. In general, QA/QC programs are designed to prevent or detect contamination and allow analytical precision and accuracy to be quantified. In addition, a QA/QC program can disclose the overall sampling and assaying variability of the sampling method itself.

Accuracy is assessed using results of CRMs (standards), and by check assaying pulp duplicates at outside accredited laboratories. Assay precision is assessed by re-processing duplicate samples from each stage of the analytical process from the primary stage of sample splitting, through sample preparation stages of crushing/splitting, pulverizing/splitting, and analysis.

Mustang's QA/QC protocol for Mayville consists of the regular insertion of blanks, duplicates, and multiple standards within each sample batch. Laboratoire Expert and Accurassay also

make duplicate assays as part of their internal QC protocols. Mustang also sends some pulp rejects to a second laboratory. RPA is of the opinion that the assay results are reliable and acceptable to support the current Mineral Resource estimate.

### **2005–2006 QA/QC RESULTS**

Mustang's assay QC protocols and results for the 2005-2006 drill program were reviewed by Analytical Solutions Ltd. (ASL), Toronto, in a report dated April 2006 by Lynda Bloom. At the time of the report, Mustang had collected and assayed 2,651 drill core samples from Mustang holes MAY05-01 to MAY06-47. Most of the QC results presented below (CRM, check assays, and Laboratoire Expert's QC data) are taken from ASL (2006).

Results from the regular submission of CRMs are used to identify problems with specific sample batches and long-term biases associated with the regular assay laboratory. QC failures occur when assays from two consecutive CRMs are greater than +/- 2SD or if the assays from a single CRM are greater than +/- 3SD of the expected values. The CRMs used by Mustang for the 2005-2006 drill programs were purchased from Geostats Pty Ltd (Geostats), Australia. The certified control values for nickel and copper are presented in Table 11-1.

**TABLE 11-1 GEOSTATS CRM VALUES, MAYVILLE PROPERTY  
Mustang Minerals Corp. – Makwa-Mayville Property**

<b>CRM ID</b>	<b>Ni (ppm)</b>	<b>Cu (ppm)</b>
GBM301-1C	26,560	561
GBM399-10C	45,821	1,406
GBM900-3	34,254	16,603
GBM999-1	11,728	435
GBM999-8	2,984	1,830

ASL reviewed results from 37 CRMs for nickel and copper. These samples represent approximately 1% of the number of samples used in the drill hole database. ASL (2006) reports that the CRM copper, nickel, and cobalt results were biased high by up to 10%. ASL (2006) believes that the bias may be due to the certified control values being derived from averaging results by a mixture of partial and total digestion analytical methods.

ASL (2006) analysis of CRMs revealed three QC failures (Sample Nos. 310043, 38607, and 76600) for which, repeat assays were requested and the database was updated accordingly.

Pulp duplicates are submitted to a second laboratory to make an additional assessment of laboratory bias. ASL (2006) reviewed results from 363 external pulp check samples assayed at Laboratoire Expert and ALS-Chemex and reports that, based on regression line analysis, nickel assays reported at Laboratoire Expert are on average 3% lower than those reported at ALS-Chemex. ASL (2006) suggests that this bias is due to different digestion procedures at the laboratories. ASL (2006) concludes that, overall, there is generally good agreement between the two laboratories for both nickel and copper results.

Analyses of pulp replicates made by Laboratoire Expert as part of its internal QC program are used to assess the reproducibility of the assay technique and to assess the homogeneity of the pulps themselves. ASL (2006) reviewed results of 352 pulp replicates for copper and 233 for nickel that Laboratoire Expert reanalyzed as part of its internal QC monitoring protocol. The results for copper and nickel reproduced within  $\pm 10\%$  and thus fall within the expected ranges.

ASL (2006) concluded that, based on the CRM and external check assay results, the Laboratoire Expert base metal assays are reliable. The CRMs show a slight high bias for Laboratoire Expert assays and the check assays at ALS-Chemex suggest a slight low bias, making it reasonable to assume that the Laboratoire Expert assays are a fair approximation of the base metal grades.

ASL (2006) recommended that Mustang's QC program include the regular submission of crushed reject duplicates. Reject duplicates consist of a second split of the crushed sample. The split should be taken using a similar method and have the same weight as the original sample. Results from the reject duplicate QC program determine if the splitting procedures are applied consistently and are appropriate. Mustang plans to add reject duplicates as part of its QC prior to the next phase of drilling.

#### **2011 – 2012 QA/QC RESULTS**

Mustang submits blank samples at a rate of one in every 100 samples. Blanks are sourced from limestone in the Garson Quarry in Garson, Manitoba. RPA reviewed results from 418 blank samples and found no evidence of contamination or sample numbering errors.

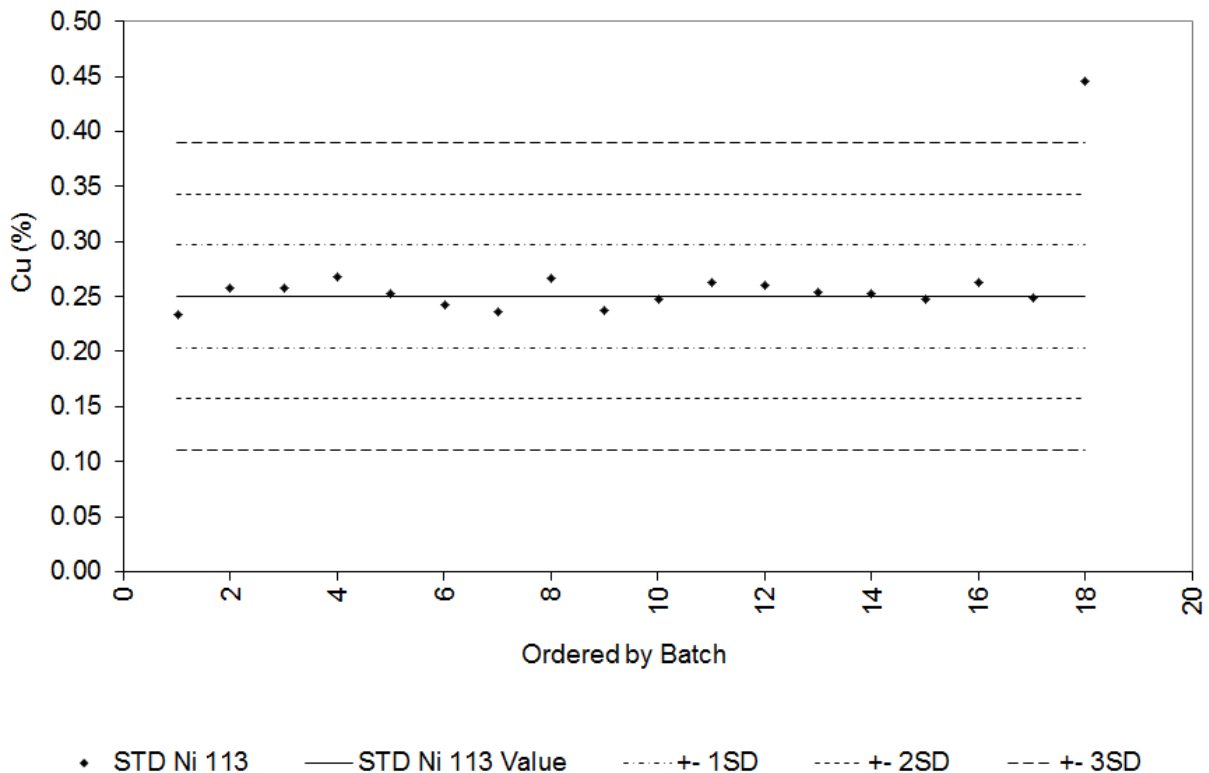
The CRMs used initially during the 2012 drill program were purchased from WCM Minerals, Canada. The certified control values and acceptable range of two standard deviations are

presented in Table 11-2. Results are plotted in Figures 11-13 to 11-18. Several numbering errors may have occurred and the results for copper for CRM Ni114 appear to be biased low, however, RPA considers the results to be acceptable for Mineral Resource estimation work.

**TABLE 11-2 CRM VALUES FROM WCM MINERALS, MAYVILLE PROPERTY  
Mustang Minerals Corp. – Makwa-Mayville Property**

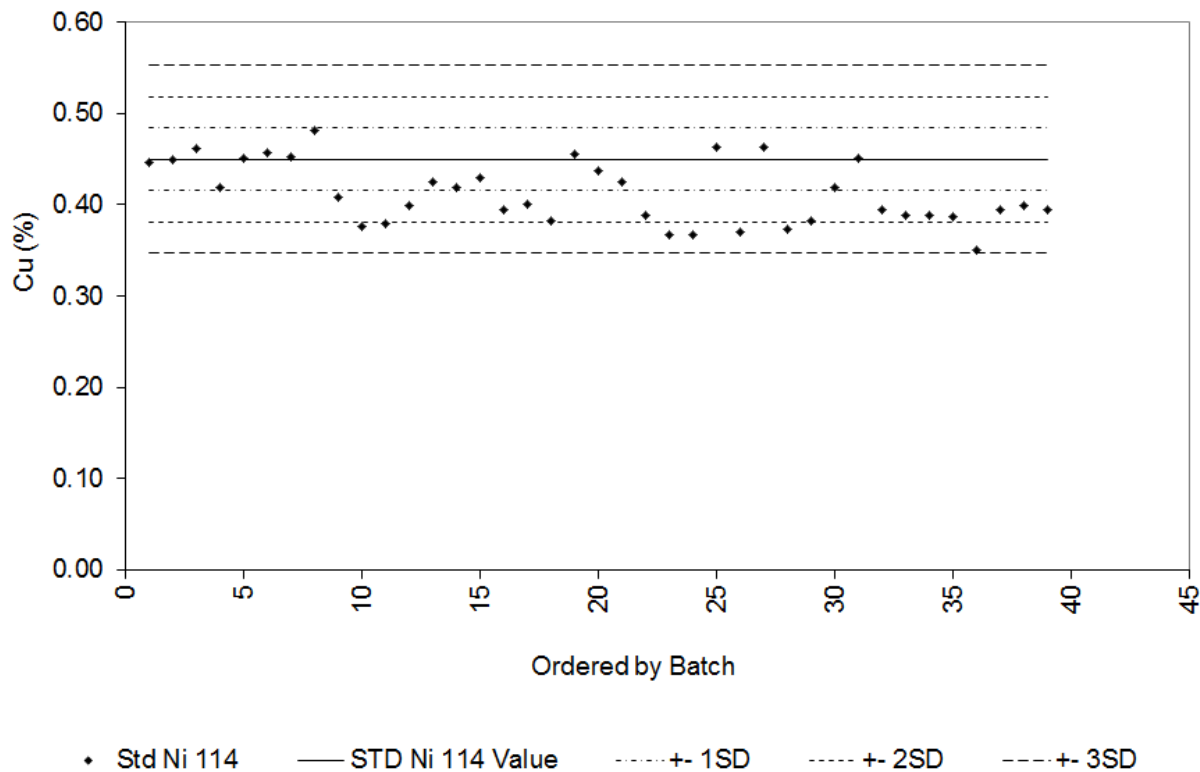
CRM ID	Ni (%)	Cu (%)
CRM Ni 113	1.24±0.34	0.25±0.10
CRM Ni 114	1.59±0.62	0.45±0.06
CRM Ni 117	0.26±0.04	0.354±0.05

**FIGURE 11-13 COPPER RESULTS FOR CRM NI113, MAYVILLE PROPERTY**

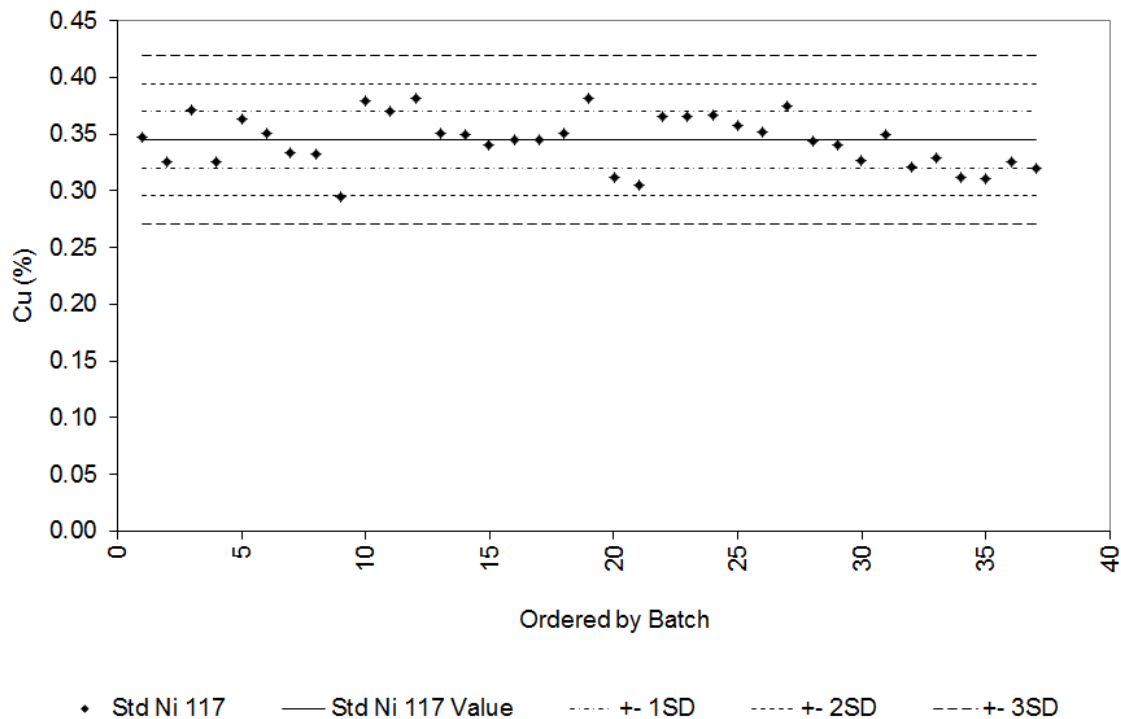




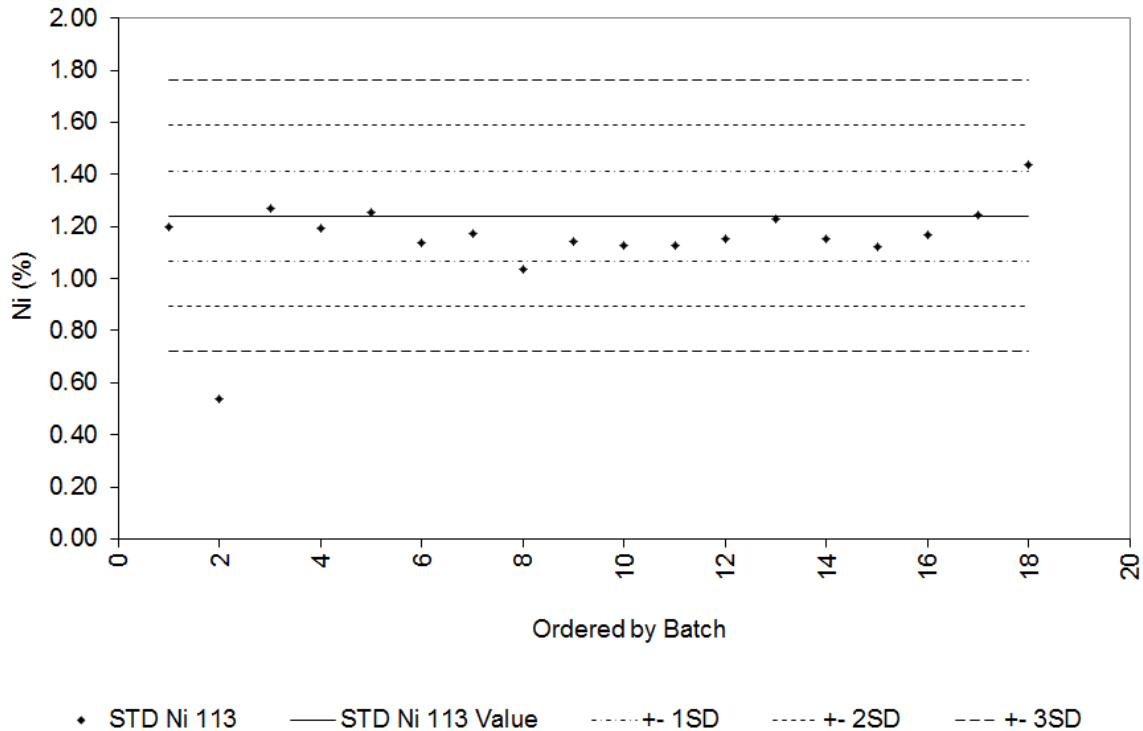
**FIGURE 11-14 COPPER RESULTS FOR CRM NI114, MAYVILLE PROPERTY**



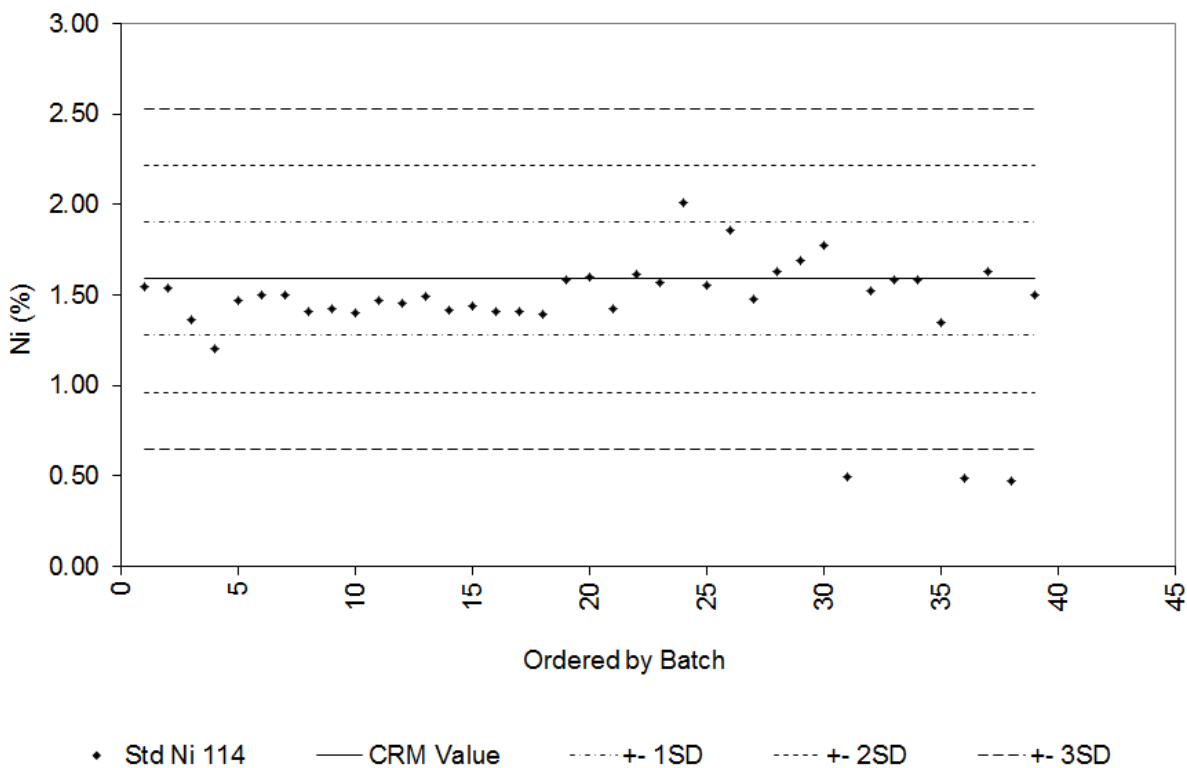
**FIGURE 11-15 COPPER RESULTS FOR CRM NI117, MAYVILLE PROPERTY**



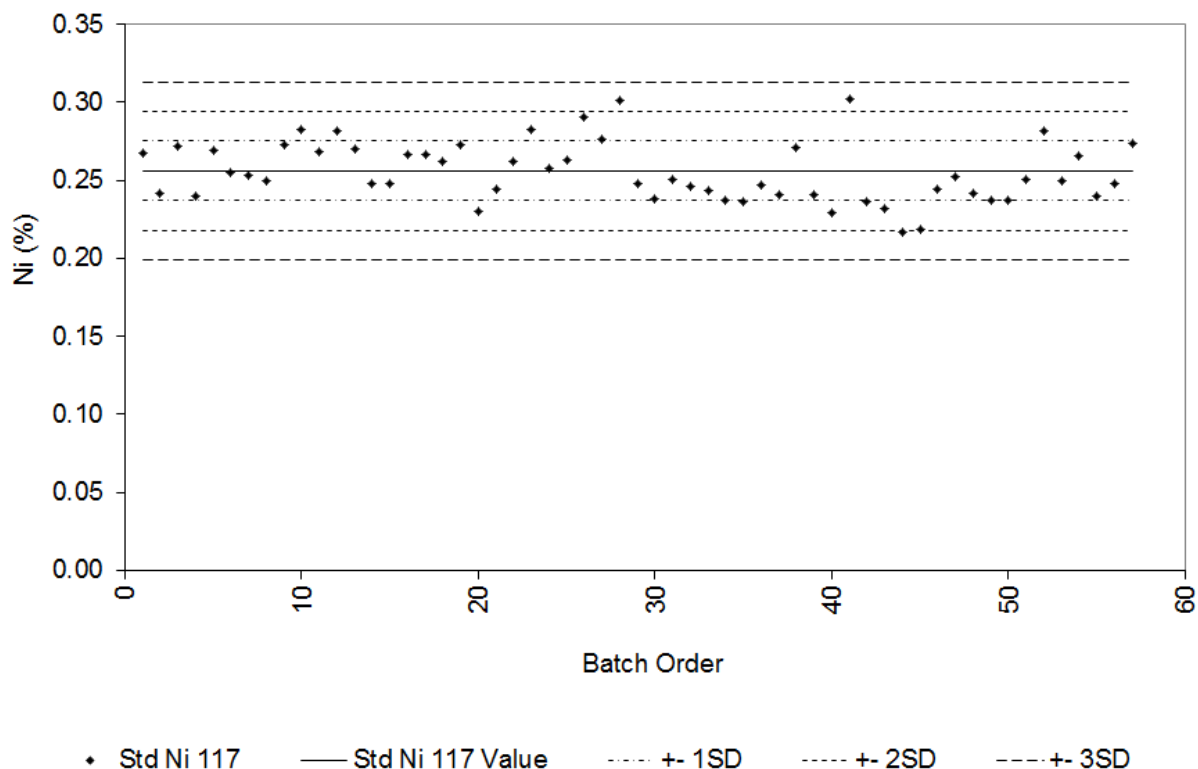
**FIGURE 11-16 NICKEL RESULTS FOR CRM NI113, MAYVILLE PROPERTY**



**FIGURE 11-17 NICKEL RESULTS FOR CRM NI114, MAYVILLE PROPERTY**



**FIGURE 11-18 NICKEL RESULTS FOR CRM NI117, MAYVILLE PROPERTY**

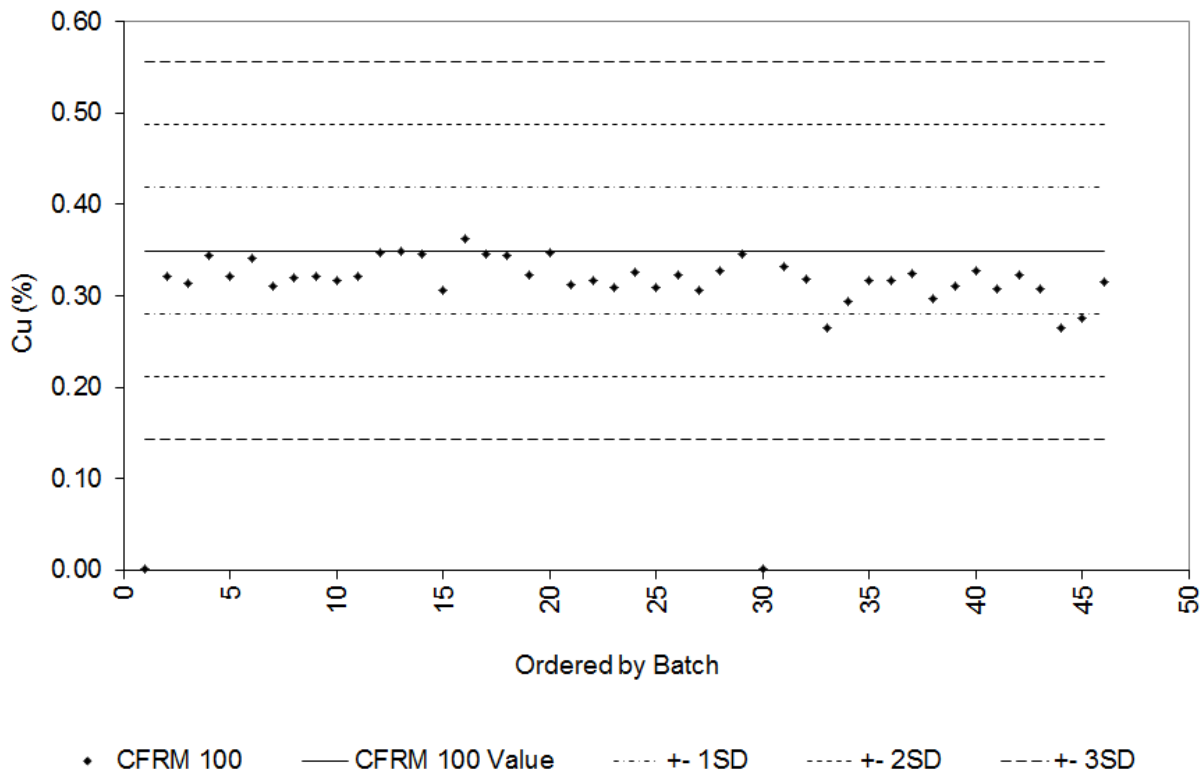


In 2012, Mustang began using CRMs from CF Reference Materials Ltd. (CF). Table 11-3 lists the expected values, and results are plotted in Figures 11-19 to 11-22. Results suggest several biases, however, this is likely due to the different digestion methods: the CRM expected values are based on a four acid digestion whereas Mustang uses aqua regia.

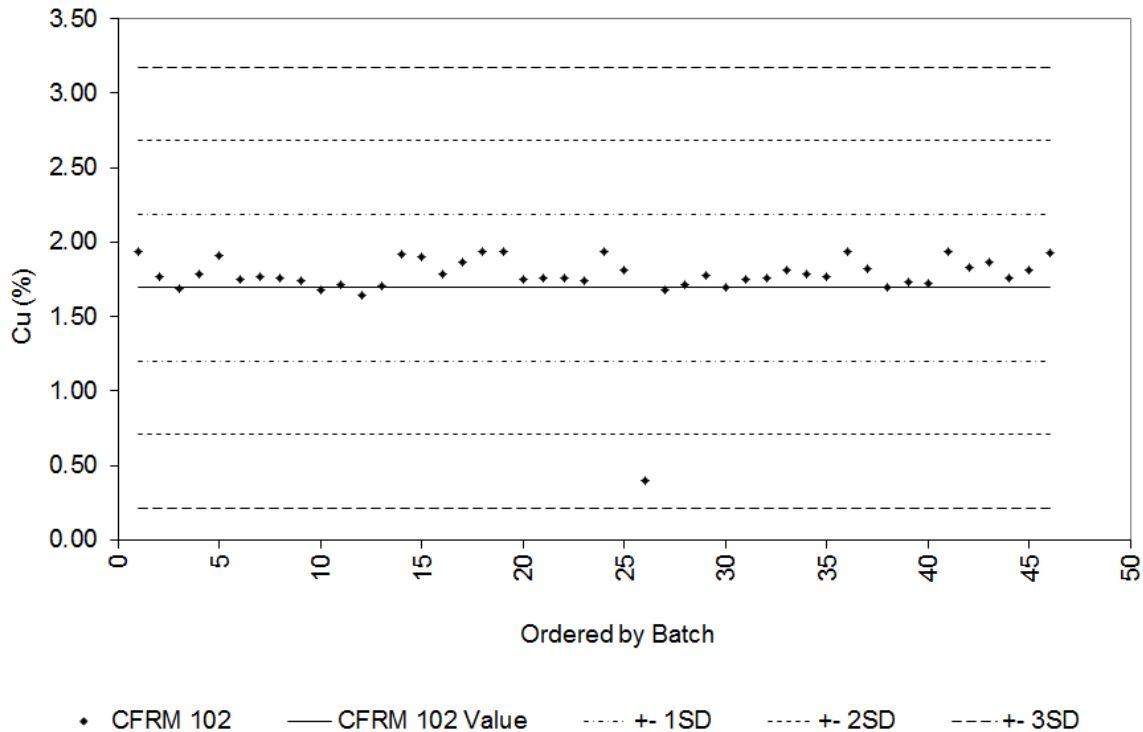
**TABLE 11-3 CF REFERENCE MATERIALS VALUES, MAYVILLE PROPERTY  
Mustang Minerals Corp. – Makwa-Mayville Project**

CRM ID	Ni (%)	Cu (%)
CFRM-100	0.30±0.12	0.35±0.14
CFRM-102	2.45±0.88	1.69±0.98

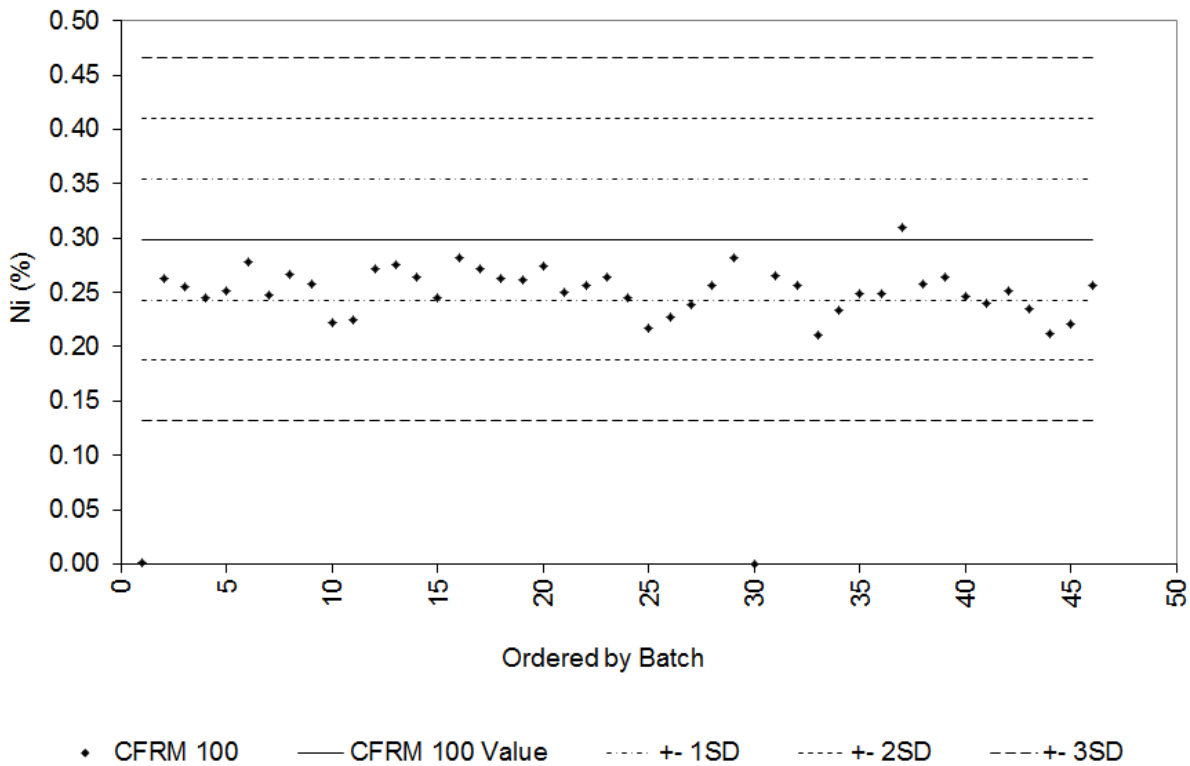
**FIGURE 11-19 COPPER RESULTS FOR CFRM-100, MAYVILLE PROPERTY**



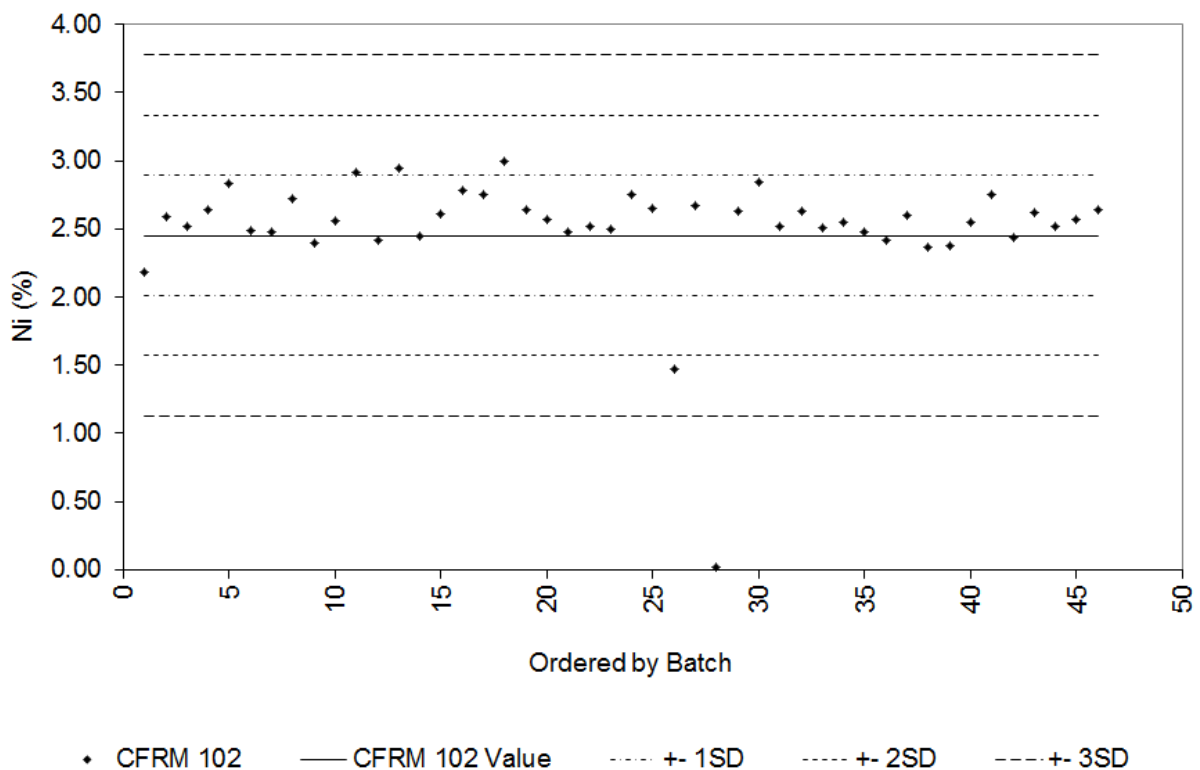
**FIGURE 11-20 COPPER RESULTS FOR CFRM-102, MAYVILLE PROPERTY**



**FIGURE 11-21 NICKEL RESULTS FOR CFRM-100, MAYVILLE PROPERTY**



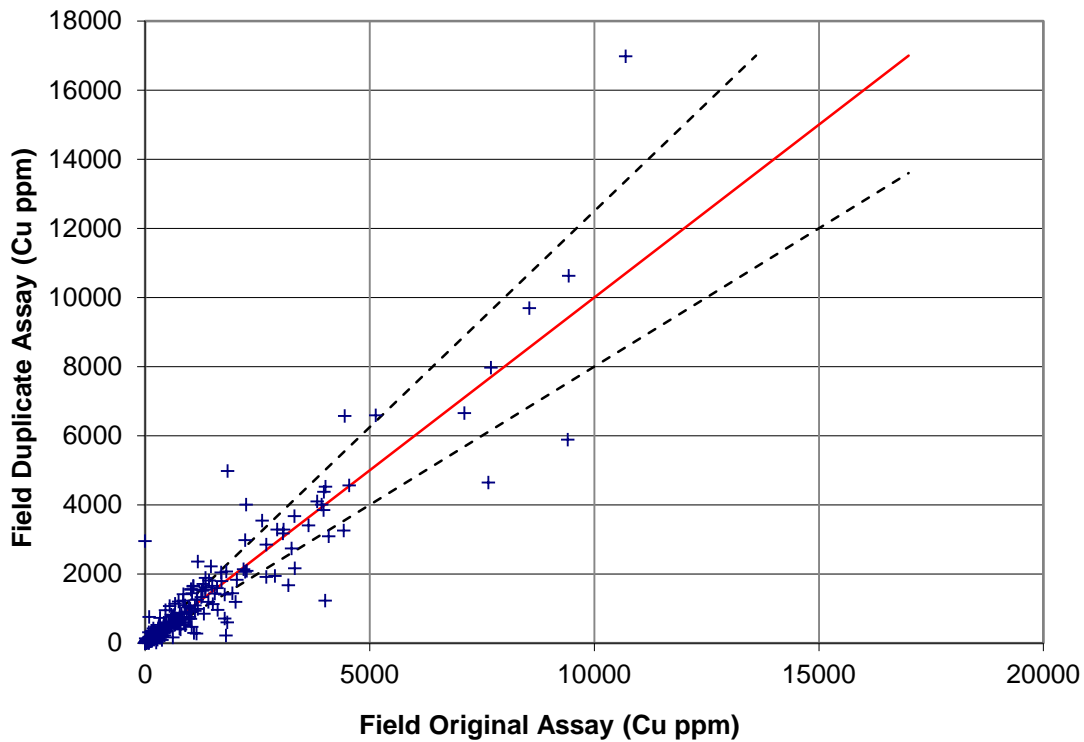
**FIGURE 11-22 NICKEL RESULTS FOR CFRM-102, MAYVILLE PROPERTY**



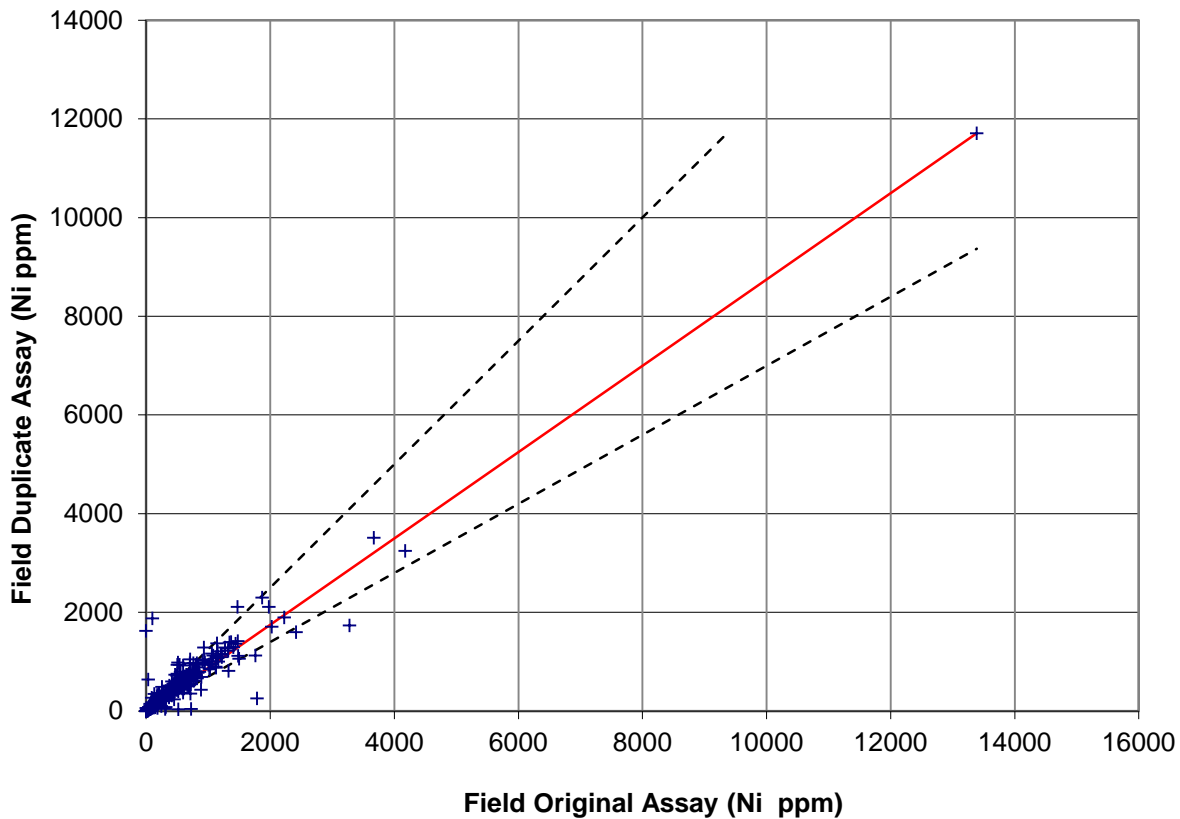
**DUPLICATE SAMPLES**

RPA received results from 502 quartered core duplicates. Results for copper and nickel are presented in Figures 11-23 and 11-24. Several points plot outside the  $\pm 20\%$  thresholds, however, results are acceptable for Mineral Resource estimation purposes.

**FIGURE 11-23 FIELD DUPLICATES COPPER, MAYVILLE PROPERTY**



**FIGURE 11-24 FIELD DUPLICATES NICKEL, MAYVILLE PROPERTY**



**ACCURASSAY INTERNAL QC**

Accurassay employs an internal QC system that tracks CRM and in-house QA standards. A combination of reference materials, including reference materials purchased from CANMET, standards created in-house by Accurassay and tested by round robin with laboratories across Canada, and ISO certified calibration standards purchased from suppliers, are used. Should any of the standards fall outside the warning limits ( $\pm 2SD$ ) re-assays are performed on 10% of the samples analyzed in the same batch and the re-assay values are compared with the original values. If the values from the re-assays match the original assays, the data is certified; if they do not match, the entire batch is re-assayed. Should any of the standards fall outside the control limit ( $\pm 3SD$ ), all assay values are rejected and all of the samples in the batch are re-assayed.

## 12 DATA VERIFICATION

The Makwa and Mayville resource databases were reviewed and verified by RPA during site visits, a series of digital queries, checks of laboratory certificates, and review of Mustang's QA/QC results. Results from the QA/QC are presented in Section 11. All other checks are described in this section. In summary, RPA considers the resource databases reliable and appropriate to prepare a Mineral Resource estimate.

### MAKWA

#### SITE VISIT

The most recent site visit to the Makwa property was carried out by Reno Pressacco, M.Sc., P.Geo., then Micon Principal Geologist and an independent QP, on September 16 to 19 2008, where field procedures for the drilling programs were discussed, representative sections of the mineralization in drill core were examined, and the surface features of the project site were reviewed.

#### **FIELD PROCEDURES**

The accuracy of the drill hole collar locations for drill holes completed by Mustang, Canmine, and MNM were discussed. It was learned that the Mustang drill hole collar locations from the 2004 and 2005 drilling programs were picked up by Pollock and Wright using a GPS survey. Some of the Mustang drill holes from the 2007 and 2008 programs remained to be established by surveying at the time of the site visit.

The accuracy of the location of the MNM and Canmine drill holes, as currently presented in the Mustang database, was considered. Examination of the collar locations in the drill logs suggests that the MNM drill hole co-ordinates were established by survey, while some of the Canmine drill hole co-ordinates were established by measurement from grid pickets and others seem to have been established by survey.

A field spot check of the accuracy of the location of 12 drill hole casings that comprised 10 Mustang drill holes and two Canmine holes was carried out. Cross checking of the field readings against the information contained in a drill hole collar listing found that seven holes correlated well, one hole location contained a significant error, and four holes could not be



cross checked either due to a lack of information, or because the identification of the drill holes in the field could not be made.

As a result of this exercise it was mutually agreed that all the drill hole collar locations should be identified in the field either by placement of a picket with an aluminum tag, or by affixing an aluminum metal tag to the casing with the drill hole name stamped into the metal. As well, it was agreed that the as-drilled location of the drill holes should be confirmed by detailed surveying using the NAD83, Zone 15 co-ordinate system and the drill logs updated with this information.

A survey of the drill hole collar locations was conducted using a backpack-mounted, survey grade GPS instrument in November 2008 by the accredited survey company Isaac and Denchuk and reported to Mustang on December 17, 2008. The collar locations were keyed to the existing topographic benchmarks at the site. A second survey by the same firm was conducted on April 8, 2009 for holes MM09-136 to MM09-144 and a previously missed hole MM07-56. All data from the survey reports has been incorporated into the database.

***DRILL CORE REVIEW AND CHECK SAMPLES:***

Selected intervals of seven drill holes were examined (MM07-87, MM04-08, MM04-09, MM07-52, MM07-17, MM07-18, and MM07-19) to observe the nature of the host rock, the alteration and the style of mineralization. As well, two intersections of mineralization in the “show core” (that core that is presented at such public venues as open houses and conventions) were also reviewed (MM04-06 and MM04-14). The mineralized intervals in the “show core” were clear examples of a typical magmatic segregated nickel-sulphide deposit, however, the nature of the mineralization in the other seven drill holes was significantly different. In the seven drill holes examined, the matrix has been strongly altered to a mixture of what is interpreted as calcite-talc-magnetite wherein the sulphide mineralization occurs as very fine to very, very, fine grained disseminations and patches with occasional short stringer/veinlets. These stringers are clearly late-stage occurrences and are typically one to two millimetres in width, however, on rare occasions the width of the veinlets can achieve five to ten centimetres in size and the veinlets can have very high grades (the one interval observed contained in excess of 8% Ni over a core length of 0.5 ft).

The footwall rocks to the north of the mineralized unit are observed to consist of relatively fresh basalts. These basalts can contain variable concentrations of nickel grades, and the

style of mineralization was observed to be both disseminated/patchy as well as stringer. Elevated levels of palladium and platinum are being encountered in a systematic manner in the hangingwall of the “Main” mineralized zone. This zone (the “Hangingwall Zone”) is expected to require the development of its own domain model.

Two drill holes were selected for check sampling. The mineralized interval in drill hole MM08-130 (402.2 ft to 509 ft) was quarter-cored by Mustang staff at their core logging facility while the pulps from the mineralized interval from drill hole MM07-67 (102.8 ft to 287 ft) were selected from the laboratories’ storage facility. A total of 10 samples from drill hole MM08-130 were submitted to TSL for determination of their nickel, copper, palladium, platinum, and cobalt contents.

A total of 41 samples from drill hole MM07-67 were submitted to Acme Analytical Laboratories Ltd. (Acme) located in Vancouver, British Columbia. The nickel, copper, and cobalt contents were determined using Acme’s 7TD method code (hot four-acid digestion on a 0.5 g split for base-metal sulphide and precious-metal mineralized material followed by an inductively coupled plasma emission spectroscopy (ICP-ES) analysis). The palladium, platinum, and gold contents were determined using Acme’s 3B method code (fire assay fusion of a 30 g aliquot with the metal contents determined by an ICP-ES analysis). At the time, Acme Vancouver had ISO 9001 accreditation.

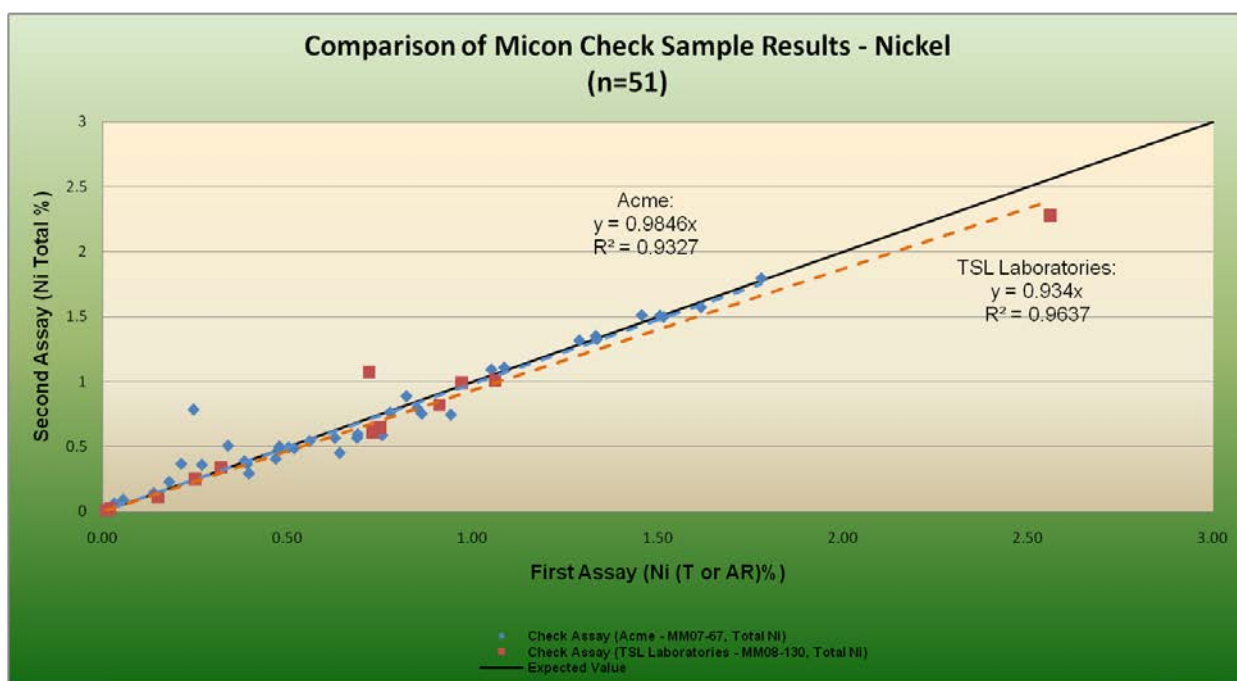
In all, a total of 51 samples were selected in order to provide an independent confirmation of the presence of nickel-copper-palladium-platinum-cobalt-gold values in those samples. The numeric results of Micon’s check assaying of these 51 sample pulps are presented in Table 12-1 and illustrated in Figures 12-1, 12-2, and 12-3. RPA opines that the selection of such a small number of samples cannot be considered as constituting a comprehensive validation of the assay values contained within the database. However, it can be seen that the check sample results obtained by RPA correlate well with the original results obtained by Mustang for nickel and copper. The correlation between the original and check sample results for palladium, however, exhibit a wider variance.

**TABLE 12-1 RESULTS OF RPA CHECK SAMPLES, MAKWA PROPERTY  
Mustang Minerals Corp. – Makwa-Mayville Project**

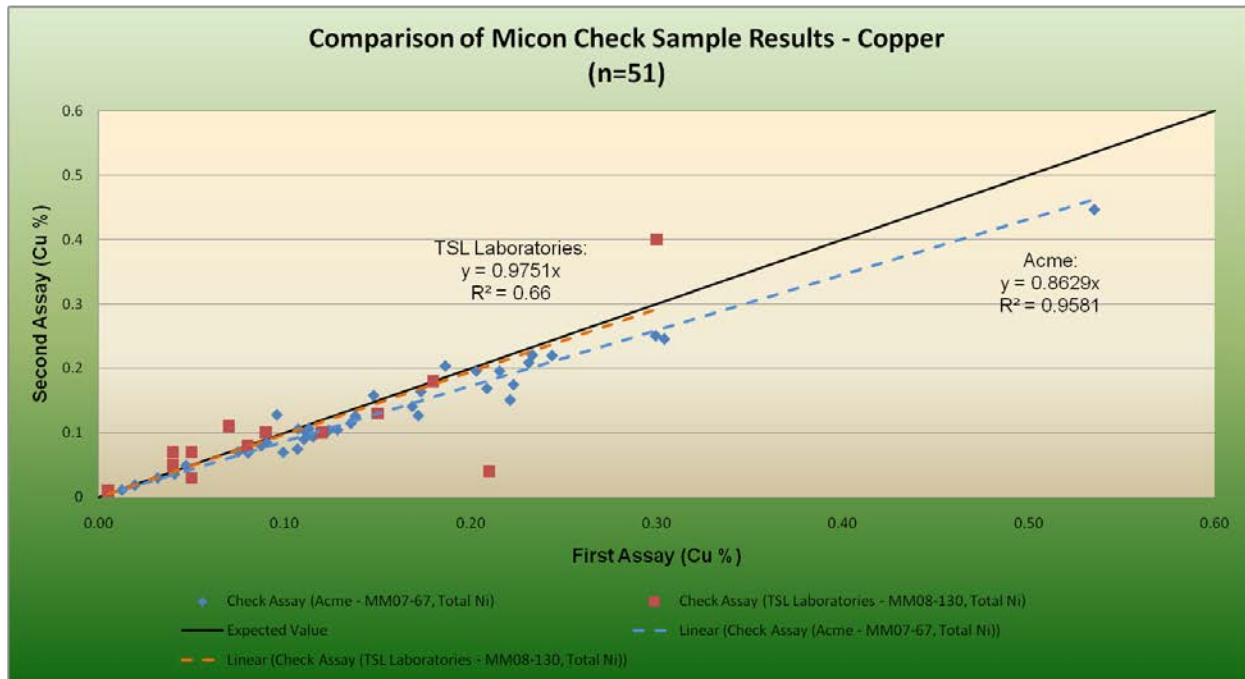
From (m)	To (m)	Sample No.	First Assay (NiT or NiAR)					Micon Check Assay (NiT)							
			Ni (%)	Cu (%)	Pd (g/t)	Pt (g/t)	Au (g/t)	Co (%)	Ni (%)	Cu (%)	Pd (g/t)	Pt (g/t)	Au (g/t)	Co (%)	
<b>Drill Hole MM07-67 (Acme Analytical Laboratories)</b>															
31.33	32.61	380066	0.21	0.10	0.21	0.04	0.00	0.02	380066	0.366	0.07	0.233	0.061	0.003	0.017
32.61	34.14	380067	0.39	0.11	0.20	0.07	0.00	0.02	380067	0.292	0.075	0.227	0.069	0.003	0.015
34.14	35.66	380068	0.64	0.10	0.43	0.18	0.00	0.02	380068	0.45	0.128	0.414	0.124	0.005	0.018
35.66	37.19	380069	0.94	0.22	0.77	0.26	0.00	0.04	380069	0.744	0.151	0.793	0.185	0.006	0.029
37.19	38.71	380071	0.75	0.17	0.59	0.20	0.00	0.03	380071	0.587	0.127	0.567	0.165	0.003	0.023
38.71	40.23	380072	0.69	0.12	0.51	0.16	0.00	0.03	380072	0.566	0.094	0.574	0.153	0.002	0.023
40.23	41.76	380073	0.38	0.05	0.17	0.04	0.00	0.02	380073	0.386	0.049	0.276	0.069	0.002	0.015
41.76	43.28	380074	0.85	0.11	0.58	0.12	0.00	0.03	380074	0.795	0.101	0.773	0.157	0.002	0.03
43.28	44.81	380075	0.52	0.17	0.45	0.27	0.00	0.02	380075	0.485	0.141	0.438	0.244	0.002	0.02
44.81	46.33	380076	0.48	0.08	0.45	0.17	0.00	0.02	380076	0.477	0.069	0.452	0.117	0.002	0.021
46.33	47.85	380077	0.50	0.09	0.46	0.14	0.00	0.02	380077	0.492	0.08	0.487	0.141	0.002	0.022
47.85	49.38	380078	0.56	0.11	0.50	0.15	0.00	0.02	380078	0.541	0.107	0.454	0.108	0.002	0.025
49.38	50.90	380079	0.78	0.14	0.54	0.13	0.01	0.03	380079	0.761	0.126	1.144	0.214	0.002	0.031
50.90	52.43	380081	1.05	0.30	1.10	0.31	0.00	0.04	380081	1.092	0.246	1.676	0.351	0.004	0.041
52.43	53.95	380082	0.86	0.14	0.58	0.16	0.00	0.03	380082	0.751	0.115	0.928	0.16	0.002	0.029
53.95	55.47	380083	0.25	0.09	0.49	0.16	0.00	0.04	380083	0.784	0.085	0.783	0.177	0.002	0.035
55.47	57.00	380084	0.69	0.11	0.32	0.08	0.00	0.03	380084	0.594	0.09	0.57	0.111	0.002	0.026
57.00	58.52	380085	1.29	0.11	0.84	0.18	0.00	0.06	380085	1.316	0.106	1.237	0.161	0.002	0.063
58.52	60.05	380086	1.46	0.15	0.98	0.46	0.00	0.05	380086	1.51	0.158	1.503	0.371	0.005	0.065
60.05	61.57	380087	1.08	0.23	0.84	0.24	0.00	0.04	380087	1.107	0.221	1.24	0.297	0.004	0.042
61.57	63.09	380088	1.78	0.20	1.44	0.30	0.00	0.06	380088	1.794	0.196	1.028	0.171	0.002	0.07
63.09	64.62	380089	1.33	0.17	1.03	0.15	0.00	0.04	380089	1.35	0.164	1.321	0.222	0.005	0.049
64.62	66.14	380091	1.34	0.23	0.66	0.15	0.00	0.04	380091	1.327	0.209	1.23	0.186	0.005	0.046
66.14	67.67	380092	1.51	0.30	1.05	0.27	0.00	0.05	380092	1.506	0.251	1.549	0.214	0.008	0.05
67.67	69.19	380093	1.62	0.22	1.09	0.17	0.00	0.06	380093	1.572	0.175	1.548	0.185	0.006	0.054
69.19	70.71	380094	1.52	0.54	1.28	0.28	0.00	0.05	380094	1.497	0.447	1.648	0.345	0.006	0.05
70.71	72.24	380095	0.82	0.24	0.56	0.24	0.00	0.03	380095	0.887	0.22	0.827	0.27	0.007	0.031
72.24	73.76	380096	0.63	0.21	0.57	0.20	0.00	0.03	380096	0.566	0.169	0.779	0.209	0.006	0.029
73.76	75.29	380097	0.27	0.08	0.57	0.23	0.00	0.01	380097	0.359	0.071	0.613	0.153	0.04	0.016
75.29	76.81	380098	0.39	0.12	0.25	0.08	0.00	0.02	380098	0.366	0.104	0.297	0.07	0.016	0.017
76.81	78.33	380099	0.47	0.13	0.33	0.11	0.01	0.02	380099	0.405	0.105	0.384	0.095	0.013	0.016
78.33	79.86	380101	0.34	0.19	0.47	0.11	0.00	0.02	380101	0.506	0.204	0.516	0.129	0.085	0.022
79.86	81.15	380102	0.48	0.22	0.42	0.14	0.00	0.03	380102	0.5	0.196	0.583	0.161	0.07	0.029
81.15	82.91	380103	0.18	0.02	0.16	0.13	0.00	0.01	380103	0.227	0.019	0.219	0.099	0.014	0.008
82.91	84.43	380104	0.14	0.03	0.31	0.10	0.00	0.01	380104	0.14	0.03	0.317	0.098	0.008	0.009
84.43	85.95	380105	0.06	0.04	0.15	0.07	0.00	0.01	380105	0.09	0.036	0.169	0.073	0.025	0.009
85.95	87.48	380106	0.03	0.01	0.06	0.03	0.00	0.00	380106	0.061	0.011	0.061	0.021	0.011	0.008
<b>Drill Hole MM08-130 (TSL Laboratories)</b>															
136.22	137.77	246171	0.73	0.12	0.71	0.18	0.01	0.03	246171	0.61	0.1	0.54	0.12	0.01	0.1
137.77	138.87	246172	0.72	0.05	0.92	0.19	0.01	0.02	246172	1.07	0.07	1.18	0.17	0.01	0.07
138.87	139.45	246173	2.56	0.08	1.99	0.54	0.03	0.08	246173	2.28	0.08	1.88	0.52	0.025	0.08
139.45	140.60	246174	0.75	0.09	0.77	0.19	0.01	0.02	246174	0.65	0.1	0.65	0.13	0.01	0.1
140.60	142.13	246175	0.97	0.21	1.05	0.23	0.03	0.03	246175	0.99	0.04	1.09	0.23	0.04	0.04
142.13	143.62	246176	1.06	0.30	0.98	0.29	0.12	0.04	246176	1.01	0.4	0.89	0.22	0.52	0.4
143.62	145.12	246177	0.91	0.18	0.86	0.21	0.03	0.03	246177	0.82	0.18	0.76	0.2	0.025	0.18

From (m)	To (m)	Sample No.	First Assay (NiT or NiAR)						Micon Check Assay (NiT)						
			Ni (%)	Cu (%)	Pd (g/t)	Pt (g/t)	Au (g/t)	Co (%)	Ni (%)	Cu (%)	Pd (g/t)	Pt (g/t)	Au (g/t)	Co (%)	
145.12	146.61	246178	0.32	0.04	0.28	0.07	0.01	0.01	246178	0.34	0.05	0.32	0.075	0.005	0.05
146.61	148.13	246179	0.25	0.15	0.22	0.07	0.03	0.02	246179	0.25	0.13	0.23	0.065	0.025	0.13
148.13	149.66	246181	0.15	0.07	0.13	0.03	0.02	0.01	246181	0.11	0.11	0.095	0.035	0.02	0.11
149.66	150.45	246182	0.02	0.01	0.01	0.01	0.01	0.01	246182	0.02	0.01	0.005	0.01	0.005	0.01
150.45	152.10	246183	0.02	0.04	0.01	0.01	0.02	0.01	246183	0.01	0.07	0.005	0.01	0.01	0.07
152.10	153.62	246184	0.01	0.05	0.01	0.01	0.01	0.01	246184	0.01	0.03	0.005	0.01	0.005	0.03
153.62	155.14	246185	0.01	0.01	0.01	0.01	0.01	0.01	246185	0.01	0.01	0.005	0.01	0.005	0.01

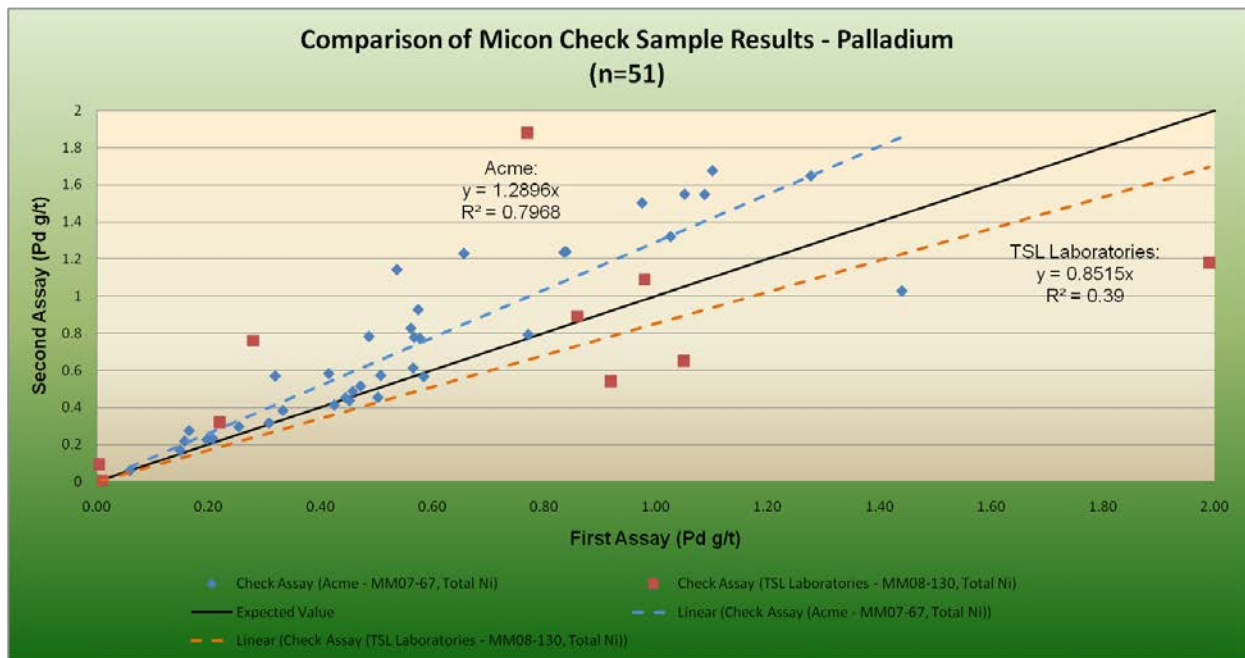
**FIGURE 12-1 COMPARISON OF NICKEL CHECK ASSAY RESULTS, MAKWA PROPERTY**



**FIGURE 12-2 COMPARISON OF COPPER CHECK ASSAY RESULTS, MAKWA PROPERTY**



**FIGURE 12-3 COMPARISON OF PALLADIUM CHECK ASSAY RESULTS, MAKWA PROPERTY**



## **MAYVILLE**

### **SITE VISIT AND DRILL CORE REVIEW**

David Ross, M.Sc., P.Geo., RPA Principal Geologist and an independent QP, visited the Mayville property most recently in December 2012. Drill core from six holes was reviewed and compared with assay results and descriptive log records made by Mustang geologists. RPA found good correlation between mineralized intercepts used to estimate grades in the block model and mineralization observed in the drill core.

### **DATABASE REVIEW**

RPA performed several database checks including tests for unreasonable grades and sample lengths, from/to mix-ups, missing sample numbers, duplicate sample numbers, unusual maximum or minimum values, etc. Drill hole traces were inspected for unreasonable bends and orientations. No significant issues were identified.

### **ASSAY TABLE VERIFICATION**

In 2006, RPA checked the Gemcom assay database against approximately one third of scanned images of the original assay certificates from holes MAY05-01 to MAY05-27. In addition, more than 50% of digital assay certificates were checked against the Gemcom assay database. A few errors for platinum, palladium, and cobalt values were found and corrected. No errors were found for copper and nickel.

In 2012, assays certificates from 15 holes drilled in 2012 were received directly from Accurassay in ASCII format. RPA verified the nickel, copper, gold, platinum, and palladium results and found no significant discrepancies.

### **RPA INDEPENDENT SAMPLING**

In 2006, RPA collected six samples of quartered core for independent analyses at SGS Minerals Services (SGS), Toronto. Sample preparation was by the SGS standard preparation package (PRP90) crushing to 75% passing 2 mm, splitting to 250 g, and pulverizing to 85% passing 75 µm. Analyses used a sodium peroxide fusion/inductively coupled plasma optical emission spectroscopy (ICP-OES) technique. The results are listed in Table 12-2.

In 2012, RPA collected an additional four samples from the 2012 drilling and submitted the quartered core to ActLabs located in Ancaster, Ontario. Sample preparation was by the standard preparation package crushing to 75% passing 2 mm, splitting to 250 g, and pulverizing to 95% passing 105 µm. Analyses of copper and nickel used an ICP-OES technique. Analysis of gold, platinum, and palladium was by fire assay. The results are listed in Table 12-2.

RPA notes that ten samples are not sufficient for statistical comparisons; however, given the small sample set, the agreement is reasonable and confirms the presence of mineralization in the samples. RPA also visually verified mineralization in the drill core for a number of drill holes.

**TABLE 12-2 RPA INDEPENDENT SAMPLING (2006 & 2012), MAYVILLE PROPERTY  
Mustang Minerals Corp. – Mustang-Mayville Project**

HOLE-ID	From (m)	To (m)	Length (m)	Mustang		RPA	
				Ni (%)	Cu (%)	Ni (%)	Cu (%)
MAY05-16	241.40	242.93	1.52	0.22	0.39	0.26	0.47
MAY05-16	242.93	244.45	1.52	0.31	0.55	0.40	0.62
MAY06-69	110.34	111.86	1.52	0.28	0.68	0.24	0.64
MAY06-69	111.86	113.63	1.77	0.21	2.11	0.24	1.89
MAY06-73	90.53	91.93	1.40	0.26	0.64	0.25	0.61
MAY06-72	91.93	92.51	0.58	0.46	12.11	0.31	12.00
MAY12-58	215.60	215.98	0.38	0.14	0.36	0.19	0.40
MAY12-58	215.98	216.50	0.52	0.32	0.42	0.43	0.55
MAY12-57	332.00	333.21	1.21	0.13	0.46	0.14	0.45
MAY12-57	341.00	342.00	1.00	0.36	1.65	0.41	1.01

## **13 MINERAL PROCESSING AND METALLURGICAL TESTING**

### **MAKWA**

As noted previously, Micon prepared a report titled: “Independent Technical Report Presenting Mineral Resource and Reserve Estimates and the Results of the Prefeasibility Study for the Maskwa Property, Manitoba” in May 2008. The information below is a summary of the metallurgical testwork reported in the study.

#### **SAMPLE PREPARATION AND ANALYSIS**

Samples of split drill core totalling approximately 200 kg were selected by Mustang and shipped for mineral processing testwork to the Process Research Associates (PRA) laboratory in Richmond, British Columbia, in May 2007. Subsequently, a low grade sample (37 kg) was sent to PRA for evaluation in October 2007.

Split drill core was crushed and blended into six sub-composite samples. Approximately equal portions of the six sub-composites were mixed to form a single master composite (Master Comp. 1), on which most of the testwork in the program was performed. The low grade sample (LNI 7) was not included in the master composite.

#### **SAMPLE CHARACTERIZATION**

##### **HEAD ASSAYS**

The head assays of the master composite sample and the six sub-composite samples are shown in Table 13-1.



**TABLE 13-1 MASTER COMPOSITE SAMPLE HEAD ASSAYS, MAKWA  
PROPERTY  
Mustang Minerals Corp. – Makwa-Mayville Project**

	Nickel (%)	Sulphide Nickel (%)	Copper (%)	Cobalt (%)	Palladium (g/t)	Platinum (g/t)	Sulphur (%)	Magnesium Oxide (%)
Master Comp. 1	0.64	0.59	0.092	0.018	0.53	0.11	2.05	28.7
HMG 1	0.61	0.61	0.085		0.51		1.94	31.2
LMG 2	0.60	0.58	0.12		0.45		2.23	24.2
HNI 3	0.98	0.96	0.093		0.80		3.14	29.6
HNI 4	0.83	0.80	0.23		0.69		3.17	26.3
LNI 5	0.32	0.30	0.051		0.21		0.80	28.9
LNI 6	0.23	0.21	0.047		0.14		0.82	20.4
LNI 7 <sup>1</sup>	0.21	0.14	0.036		-		0.21	30.2

<sup>1</sup> Not included in Master Comp. 1.

The majority of nickel is contained in sulphide nickel, with the balance assumed to be within the silicate matrix. Platinum and cobalt may offer potential as by-products.

Potentially deleterious elements such as arsenic and mercury were below detection limits of 5 ppm and 3 ppm, respectively, in the head samples. Antimony ranged from 10 ppm to 40 ppm and lead ranged from less than 2 ppm to 20 ppm in the composite samples tested.

Most of the testing was performed on the Master Comp. 1 sample, with variability testing on the original six composites and on the later low grade composite (LNI 7).

#### **MINERALOGY**

The host rock for Master Comp. 1 sample is carbonate (dolomite or magnesite) and magnesium silicates with magnetite as an abundant accessory. The more highly mineralized of the six sub-composite samples were described as altered, mineralized, ultramafic rock composed of talc and serpentine with carbonate and magnetite as the principal accessories. Primary sulphides were pyrrhotite and pentlandite with accessory chalcopyrite.

Sulphide particles were generally between 5 µm and 100 µm and ranged between well-segregated and intimately intergrown. Some partial intergrowth with magnetite was reported although initial magnetic separation studies indicated only minor improvement to nickel recovery.

### **BOND BALL MILL WORK INDEX**

A single Bond Ball Mill Work index test was performed on Master Comp. 1. A Bond Work index of 13.2 kWh/t was obtained. Laboratory grinding tests were carried out on Master Comp. 1 in order to estimate the target grind for the study program. There was considerable variation in the grind times required to reach similar targeted particle size distribution. This suggests significant differences in the hardness of individual minerals, talc and sulphide contents and dissemination. Additional comminution studies were recommended.

### **ACID BASE ACCOUNTING**

ABA testing was carried out on the flotation tailing generated from some of the composites. A positive net neutralizing potential ranged from 118 kg to 226 kg CaCO<sub>3</sub> equivalent per tonne.

Acid generation potential ranged from 2.5 kg to 28.4 kg CaCO<sub>3</sub>/t and the neutralizing potential was 152 kg to 257 kg CaCO<sub>3</sub>/t.

### **FLOTATION**

A series of open cycle, kinetic and cleaning flotation studies were performed.

#### **ROUGHER KINETIC FLOTATION**

A series of kinetic tests were performed on the Master Comp. 1 sample. The first three tests assessed the results of primary grind size against bulk rougher flotation, as shown in Table 13-2.

**TABLE 13-2 MASTER COMP. 1, BULK ROUGHER FLOTATION VERSUS GRIND, MAKWA PROPERTY**  
Mustang Minerals Corp. – Makwa-Mayville Project

Test Number	Grind P <sub>80</sub> (µm)	Final Tailing Grade (%)			Recovery (%)			
		Total Nickel	Sulphide Nickel	Sulphur	Total Nickel	Sulphide Nickel	Sulphur	Mass
F1	57	0.17	0.12	0.91	76	82	61	13
F2	78	0.22	0.16	0.96	72	77	64	19
F3	155	0.28	0.22	1.12	64	68	57	18

Bulk recovery improved with finer grind. Sulphur recovery remained below recovery of sulphide nickel indicating that pyrrhotite did not respond to flotation as well as pentlandite.

Modifying reagent schemes did not show obvious improvement in nickel sulphide recovery compared with the initial, baseline reagent scheme.

#### **OPEN CYCLE CLEANING FLOTATION**

Open cycle flotation testing on the various composite and sub-composite samples resulted in nickel bulk recoveries that ranged between 62% and 86%. Corresponding final concentrate grades varied between 8% Ni and 16% Ni. Nickel recovery appears to be related to the overall sulphide content, particle dissemination and mineral associations, as well as the ratio of sulphide nickel to total nickel (i.e., including nickel in silicates) particularly so for the lower grade samples. The product concentrate grade will be influenced by the ratio of pentlandite to other sulphide minerals (primarily pyrrhotite and chalcopyrite) in the feed, as well as the magnetite and talc contents.

#### **LOCKED CYCLE FLOTATION**

From evaluation of the open cycle flotation test data, two 6-cycle, locked cycle tests were performed on Master Comp. 1. The results showed that the final concentrate and bulk tailing maintained reasonably consistent grades, which generally agreed with the corresponding open cycle program.

The second locked cycle test resulted in a conceptual process flowsheet using a target primary grind particle size of 80% passing 55 µm and comprising rougher flotation and cleaning and a scavenger circuit. A regrind step was included on the rougher cleaner circuit, to regrind the rougher cleaner tails, prior to scavenger cleaner flotation.

The results are shown in Table 13-3.

**TABLE 13-3 MASTER COMP. 1, CONCEPTUAL FLOWSHEET RESPONSE,  
MAKWA PROPERTY  
Mustang Minerals Corp. – Makwa-Mayville Project**

Stream	Cycle Number (Total Nickel %)			Distribution (%)					
	1	3	6	Mass	Total Nickel	Sulphide Nickel	Copper	Cobalt	Palladium
Bulk Tail	0.16	0.12	0.19	44.9	12.9	11.3	9.4	15.0	11.0
1 <sup>st</sup> Cl Sc Tail	0.14	0.13	0.18	51.4	14.4	10.9	9.1	14.0	6.0
Final Concentrate	11.2	10.0	10.3	4.0	72.7	77.8	81.4	71.0	83.0

The conceptual flowsheet developed from the second locked cycle test is shown in Figure 13-1.

Metal recoveries to the final concentrate were approximately 72% for nickel, 81% for copper, 71% for cobalt, and 83% for palladium. Metal grades in the concentrate were:

- Nickel 10.2%
- Copper 2.5%
- Cobalt 0.36%
- Palladium 9.8 g/t
- Platinum 1.5 g/t

The concentrate also contained approximately 5.4% MgO, 33% sulphur, and 35% iron.

In April 2010, PRA (Inspectorate) updated the previous flotation work in a report titled “Confirmatory Flotation Study to Address Grade and Recovery Issues-Maskwa Nickel Project Southeastern Manitoba” prepared for Mustang. The summary from the report follows.

More than 15 variability samples from the Maskwa Nickel Project were tested in separate grinding-flotation tests (F43-F83). Head grades ranged from 0.22% Ni to 1.26% Ni, with 0.01% Cu to 0.23% Cu, 15% MgO to 33% MgO, and 0.13% S to 4.2% S contents. A persistent low level of Co, Pt, Pd, Au, Ag, without any Rh, was detected.

In general, 4 kg tests were conducted in two batch grinds and rougher floats to provide adequate material for a single line of cleaning. Grinding and regrinding were conducted in stainless steel mills. The flowsheet established in 2008 was used in all tests to provide good comparison of the feed materials.

A number of composites and test feed samples were taken from samples stored in the freezer and dating back to work started in 2007-2008. This enabled a range of feed nickel content to be tested with the objective of establishing a grade/recovery relationship.

Product grades (9% Ni to 18% Ni) and recoveries varied with head grades, grind size and mass pulls, while primary tailings usually graded about 0.15% Ni (mainly non-sulphides).

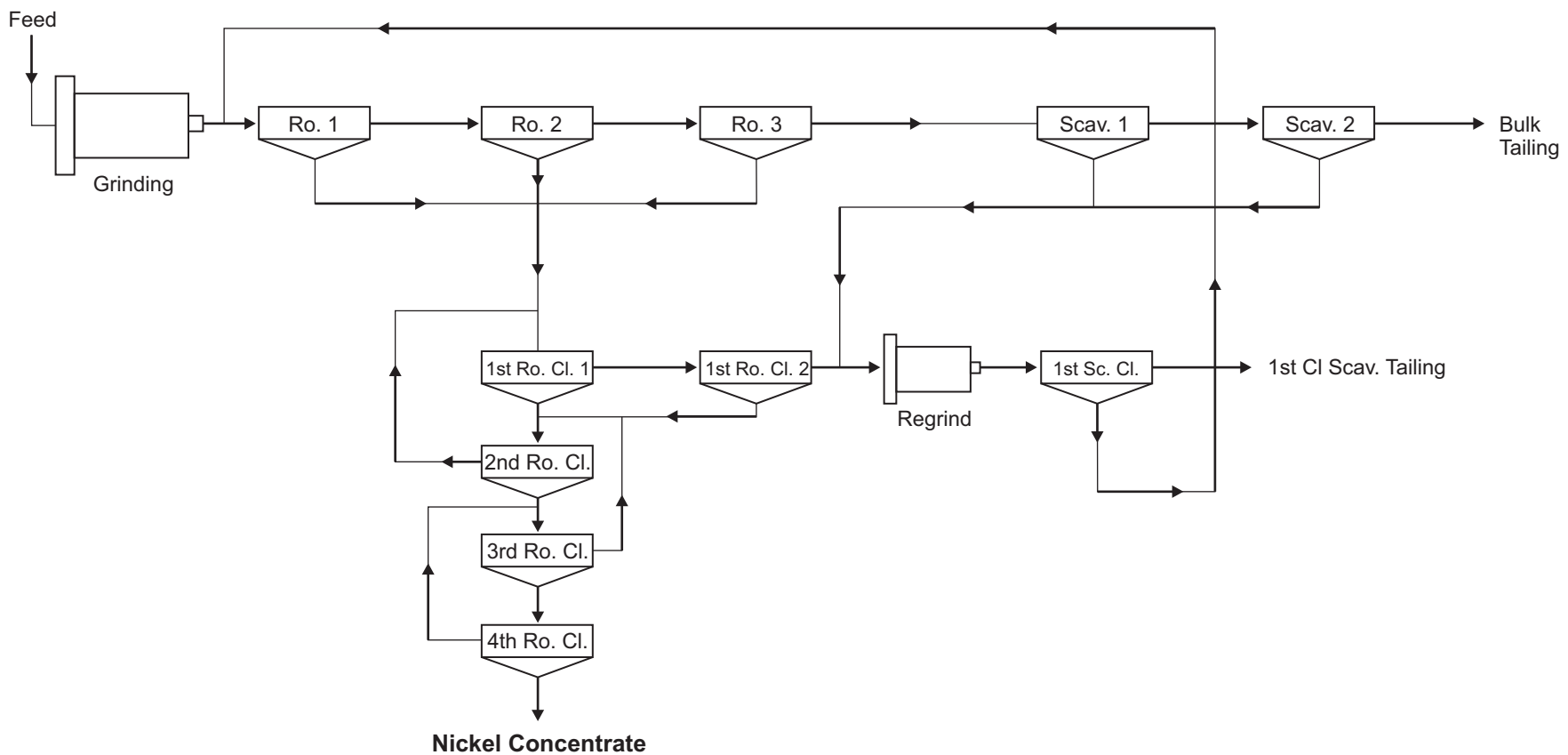


Figure 13-1

**Flotation:**  
 Ro. = Rougher  
 Scav. = Scavenger  
 Cl. = Cleaner

**Mustang Minerals Corp.**  
**Mayville-Makwa Project**  
 Southern Manitoba, Canada  
**Makwa Conceptual Flowsheet**  
 Developed from  
**FLC2 Locked Cycle Test**

Locked-cycle testing of the HW Blend (0.23% Ni) yielded an inferred product grade of 15% Ni at 54% recovery in 1.1% of the mass. Another locked-cycle test on the MZ Blend with a coarser regrind size, achieved 8.6% Ni product grade at 76% recovery in 6.1% of the mass.

The report made the following conclusions and recommendations:

Various sample types and mineralized material grades from the Maskwa Nickel project responded encouragingly to a common flotation procedure in a consistent fashion. A major objective is to push the tailings grades near the 0.10% Ni limit, close to the background level of Ni in silicates, whilst producing a 10% Ni concentrate-grade overall. This can be achieved by extended primary flotation (~40 minutes in total) at  $P_{80}$  ~60  $\mu\text{m}$  to adequately liberate gangue that can be controlled by frequent CMC additions. A fine regrind ( $P_{80}$  ~25  $\mu\text{m}$ ) of scavenged middlings is then required in the cleaner circuit. Much of the less-liberated Ni seems to be associated with pyrrhotite. The recovery of Ni, Cu, Co, Pt, and Pd values is typically on the order of 75% or higher in locked-cycle mode; slightly lesser amounts of Au and Ag also float.

Since 2006, several schemes to improve the flotation results through reagent and configuration variations have generated a reliable flow sheet and a preliminary plant design. During the review of previous results and the latest findings in 2009, a note was made that  $\geq 75\%$  of Ni (liberated & Cu-activated) will float in 10- minutes.

SGS Mineralogical Laboratories in Perth, Western Australia, also carried out tests on Makwa ore. The date of the testwork is 2012, but the work was done to verify the flotation regime used in the prefeasibility study. Sixty-three (63) flotation tests, one locked cycle test and seventeen (17) variability tests were carried out.

The results showed:

- Reduction of mass pull resulted in higher nickel concentrate grade.
- Primary grind size of approximately  $P_{80}$  of 45 micron, with the regrind size having a  $P_{80}$  of 20  $\mu\text{m}$  to 23  $\mu\text{m}$ .
- Variability testing resulted in recoveries ranging from 40% to 70%, with nickel grades ranging from 0.2% to 1.2% in the feed. The associated concentrate grades were in the range of 6% to 10% nickel.
- Mass pull under 8% resulted in nickel concentrate grades up to 10%. Above 10% mass pull nickel concentrate grade did not exceed 4%.

## MAYVILLE

FR Wright & Associates Consulting (FR Wright) performed preliminary flotation testing in early 2005 on a single mineral composite from the Mayville Property. The purpose of the testing was to evaluate the use of sulphide flotation to recover copper and nickel

mineralization. FR Wright concluded that the composite responded to flotation procedures developed for extraction of copper and nickel, and reported open cycle rougher and scavenger flotation recoveries of up to 91% of the nickel and 96% of the copper.

Internal work carried out by PRA for Mustang on Mayville in 2009 and 2010, resulted in the summary shown in Table 13-4 below:

**TABLE 13-4 MAYVILLE FLOTATION TEST SUMMARY**  
**Mustang Minerals Corp. – Makwa-Mayville Project**

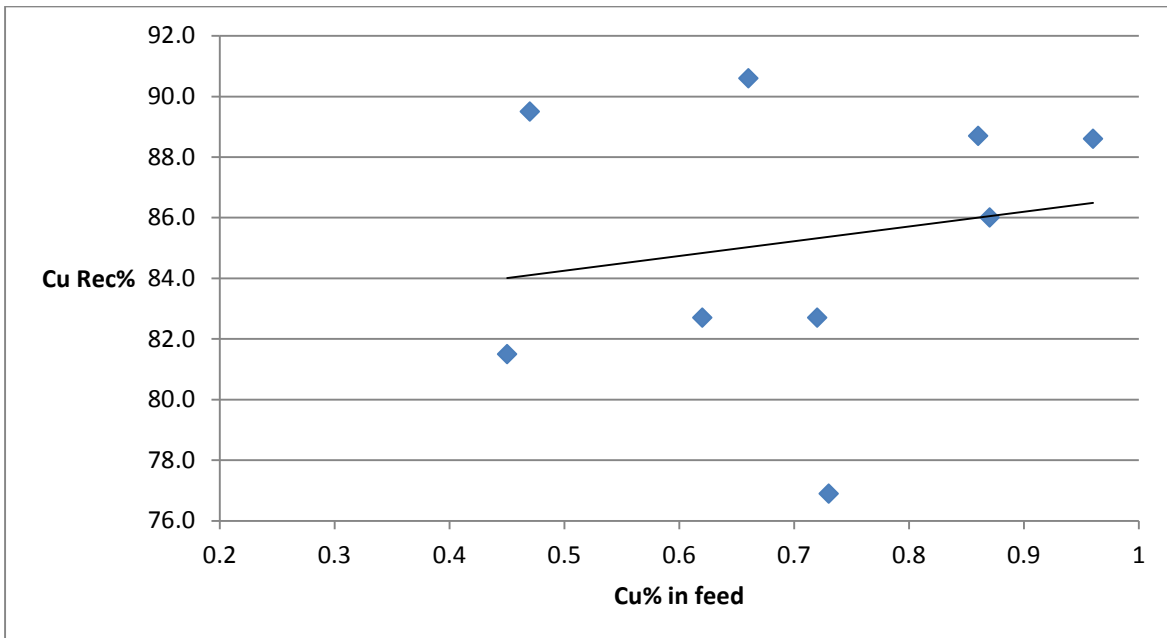
Test #	Feed		Cu Concentrate		Ni Concentrate	
	% Cu	% Ni	% Cu	Recovery(%)	% Ni	Recovery(%)
7	0.87	0.34	32.05	86.0	4.4	57.3
8	0.86	0.34	28.96	88.7	10.2	41.8
9	0.96	0.39	33.22	88.6	9.9	47.3
10	0.47	0.20	29.95	89.5	8.9	31.9
11	0.66	0.26	23.15	90.6	8.2	14.1
12	0.62	0.27	29.77	82.7	9.6	44.4
13	0.72	0.30	30.11	82.7	8.8	44.7
14	0.73	0.32	27.69	76.9	8.7	31.5
15	0.45	0.19	25.81	81.5	7.8	19.9

Based on the data in Table 13-4, Figures 13-2 and 13-3 show the grade/recovery relationships for Mayville copper and nickel concentrates. It appears from the testwork completed to date that separate nickel and copper concentrates can be generated from the Mayville feed material. It can be seen that the trend line for copper (Figure 13-2) shows recoveries ranging from 84% to 86% over a range of 0.4% Cu to 1.0% Cu in the feed. Copper concentrate grades range from 25% Cu to 33% Cu.

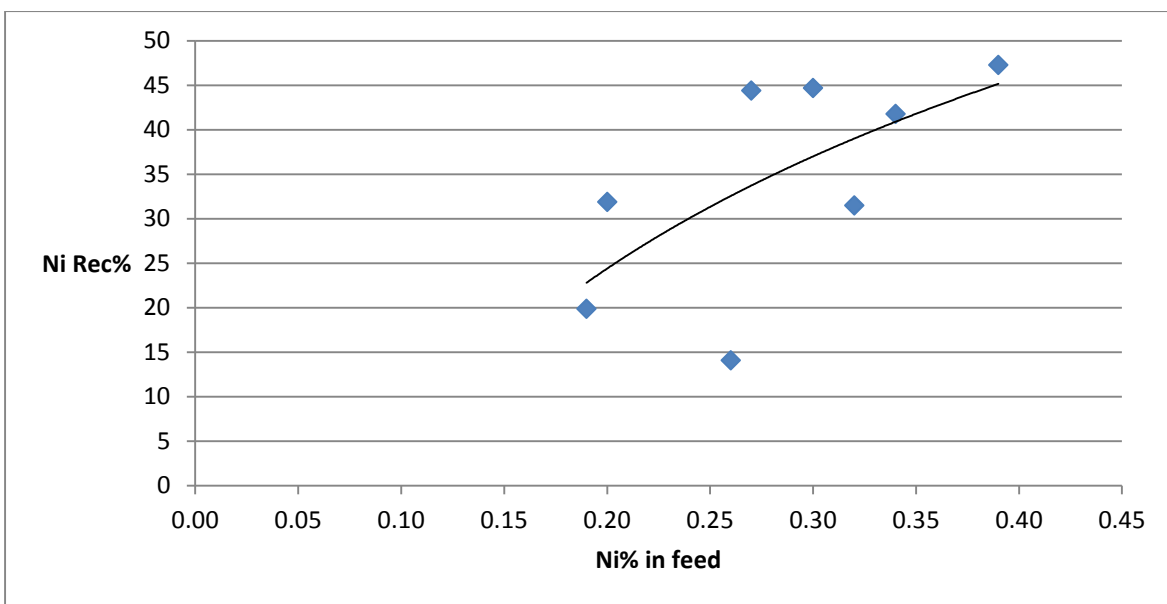
For nickel (Figure 13-3), the trend line recoveries range from 25% to 45% at feed grades ranging from 0.19% Ni to 0.39% Ni. At this early stage of the Project, the feed samples appear to be representative of the Mayville orebody.

Nickel concentrate grades range from 4.4% Ni to 10.2% Ni, based on preliminary testwork. Further testwork should be carried out to optimize the process and determine if any deleterious elements are present in the concentrate.

**FIGURE 13-2 MAYVILLE COPPER GRADE/RECOVERY GRAPH**



**FIGURE 13-3 MAYVILLE NICKEL GRADE/RECOVERY GRAPH**





## 14 MINERAL RESOURCE ESTIMATES

### MAKWA MINERAL RESOURCE ESTIMATE

RPA updated the Mineral Resource for the Makwa deposit using drill hole data available as of October 2009. At an NSR cut-off value of C\$20.64/t, Indicated Mineral Resources are estimated to total 7.20 million tonnes of 0.61% Ni, 0.13% Cu, 0.36 g/t Pd, 0.10 g/t Pt, and 0.01% Co. At the same cut-off, Inferred Mineral Resources are estimated to total 0.67 million tonnes of 0.27% Ni, 0.08% Cu, 0.14 g/t Pd, 0.05 g/t Pt, and 0.02% Co.

The Makwa Mineral Resources were estimated in accordance with the definitions contained in the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards for Mineral Resources and Mineral Reserves (CIM definitions).

### DESCRIPTION OF THE DATABASE

Mustang provided to RPA the digital database wherein drill hole data such as collar location, down hole survey, lithology, density measurements and assays were stored in comma delimited format. This drill hole database contains information from a number of sources including original Falconbridge drilling, drill holes completed by Canmine Resources, and a number of drill holes (144) completed by Mustang during the course of its evaluation of the mineral potential of the Makwa property. As well, the information obtained from 19 geotechnical test pits and 15 drill holes, that were completed in 2009, to examine the overburden conditions at selected sites in the proposed tailings storage and proposed plant site areas, was also included in this database. The data from one drill hole that was completed to obtain additional sample for metallurgical testing (MH-1) were also included in the database. In all, the drill hole database includes 256 drill holes that were completed at a nominal spacing of 100 ft x100 ft (30 m x 30 m) and included information up to and including drill hole MM09-144. Despite the strike of the mineralization being approximately 070°, it was decided to retain the orientation of the cross sections as north-south to honour the volume of drilling that has already been completed.

The drill hole data in this database were stored in Imperial measurement format, in accordance with the historical treatment for this property. However, after consultation with Mustang staff, it was agreed that the drill hole data would be converted into metric format

(UTM, Zone 15, NAD83) to comply with the rest of the engineering data for this Project. The conversion was accomplished using DDH 7443 as a base point. This drill hole is located in the central portions of the data set; consequently, any errors resulting from the transform should be distributed equally from this point. The following sequence of steps was followed to complete the conversion:

**Step 1:** Multiply all XYZ imperial coordinates by 0.3048. This converts to a metric-scaled grid, but it is not in the correct spatial location relative to the remainder of the engineering data.

**Step 2:** Apply the following XY transform to all data points:

$$Y = Y + 5,593,623.685$$

$$X = X + 325,664.002$$

No transformation is required for the Z coordinates, as the metric equivalents of the old imperial elevations were retained for the metric grid.

**Step 3:** Apply a rotation of 2° clockwise, centred upon the collar of DDH7443.

The XY transform that was completed for Step 2 was accomplished using three Falconbridge historical bench marks (T-1, T-2, and T-3) that have survived the passage of time. These bench marks were located in the field (Figure 14-1), and their locations on the metric grid were picked up by survey (Table 14-1). Their original co-ordinates were determined by scaling from an original map of the as mined surface of the open pit that was found in the Mustang files (Figure 14-2).

**TABLE 14-1 SUMMARY OF METRIC SURVEY COORDINATES FOR THE FALCONBRIDGE BENCH MARKS AT MAKWA Mustang Minerals Corp. – Makwa-Mayville Project**

Bench Mark	Northing (Y)	Easting (X)
T-1	5,593,199.238	325,636.191
T-2	5,593,168.727	325,562.663
T-3	5,593,100.575	325,649.000

**FIGURE 14-1 VIEW OF FALCONBRIDGE BENCH MARK T-3, LOOKING NORTHEAST, MAKWA PROPERTY**

Flooded Makwa Open Pit Mine in Background

The drill hole information was modified slightly so as to be compatible with the format requirements of the Gemcom-Surpac v6.1.1 mine planning software and was imported into that software package. A number of additional tables were created during the process of creating a grade block model of the mineralization found at the Makwa deposit, in order to store such information as composite assays, zone composites, and assorted domain codes. A description of the revised database (Table 14-2) and a plan view map showing the drill hole locations (Figure 14-3) follow.

**TABLE 14-2 SUMMARY OF MAKWA DRILL HOLE DATABASE (AS AT  
OCTOBER 14, 2009)  
Mustang Minerals Corp. – Makwa-Mayville Project**

<b>Table Name</b>	<b>Data Type</b>	<b>Table Type</b>	<b>No. Records</b>
assay_capped	interval	time-independent	4,902
assay_raw	interval	time-independent	13,849
assay_raw2	interval	time-independent	13,898
basal_flag_407	interval	time-independent	138
collar			291
litho	interval	time-independent	2,774
minzone_flags	interval	time-independent	377
styles			91
survey			1,381
translation			0

Upon completion of importing the drill hole information into the Gemcom-Surpac mine modelling software, an examination of the drill hole traces revealed that many displayed abrupt and/or large changes in strike. In RPA's experience, these were likely due to errors in the downhole survey readings, due either to operator error or to effects of magnetic rocks (e.g., drill holes MM08-100 and MM08-103 as shown in Figure 14-3). A number of errors such as overlapping sample intervals, duplicate sample intervals and data entry errors were also identified by the mine modelling package upon importing of the data. Consequently, a program of scrubbing of the database was completed and all identified errors were corrected in those drill holes used for the preparation of the Mineral Resource estimate.

As part of the data review, two drill holes were identified for which the results did not correlate well with information from adjoining drill holes. Consequently, these two holes (DDH 105 and MM05-51) were removed from the modelling exercise by adding 1,000 m to the collar elevations. In this manner, the holes are effectively removed from the modelling process, but are retained in the database in the event that possible future information may resolve the discrepancies.



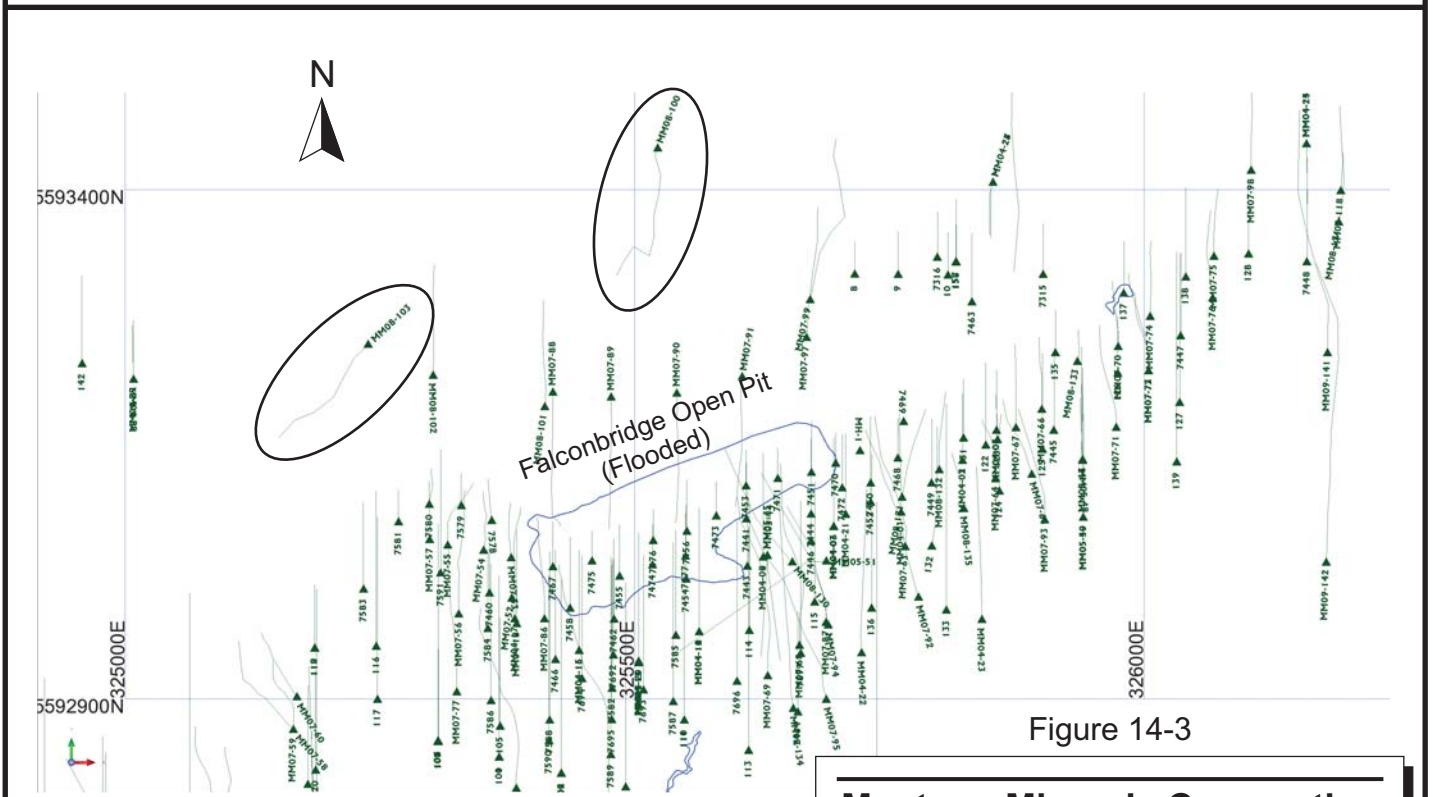
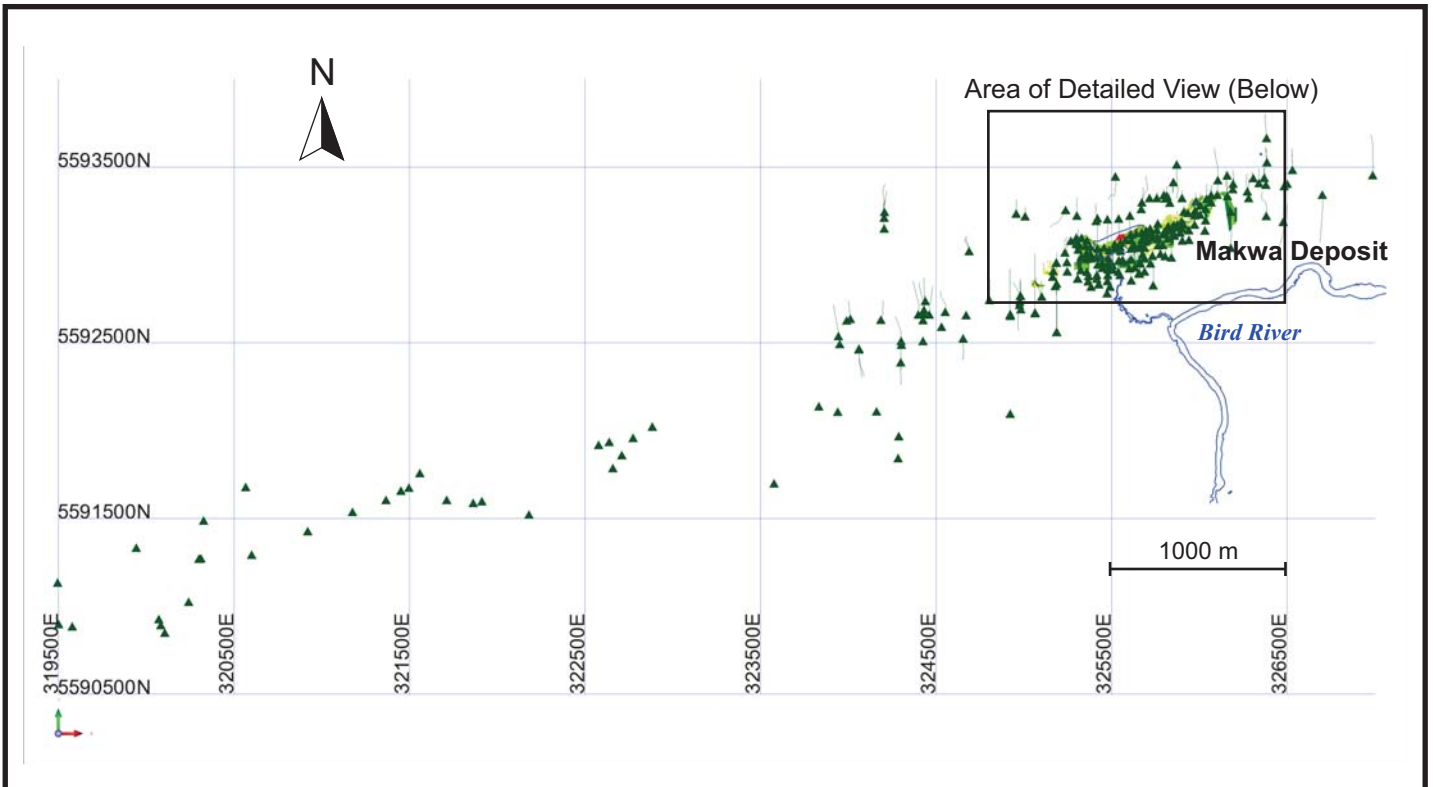


Figure 14-3

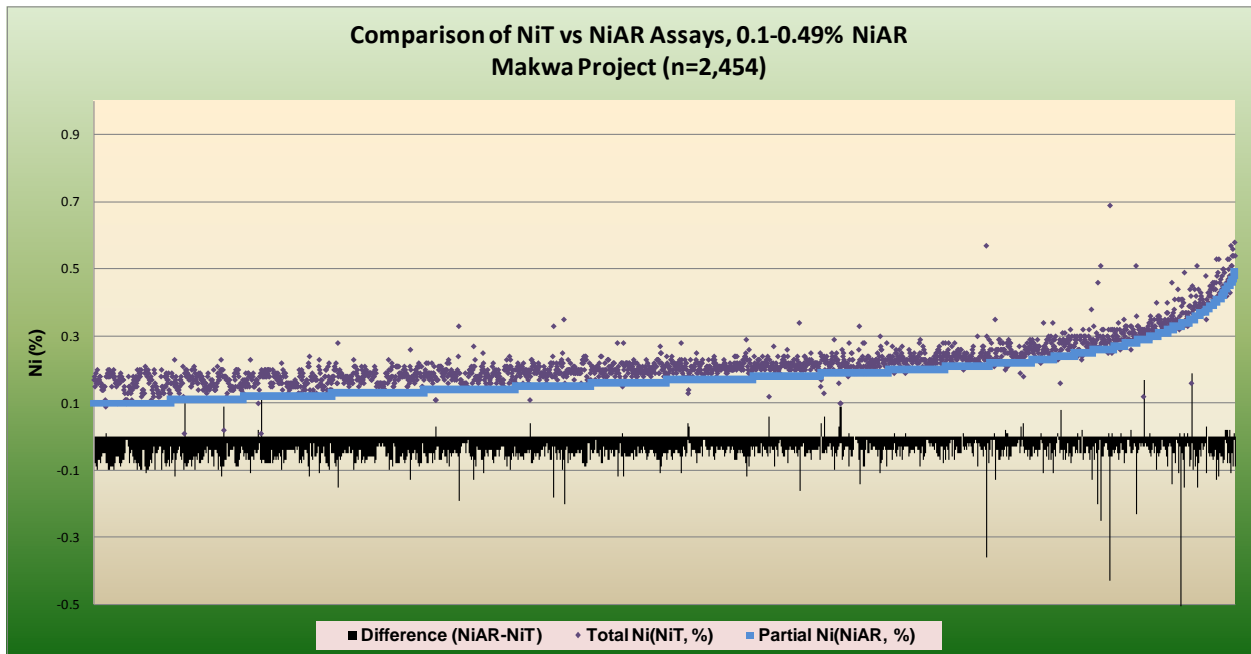
**Mustang Minerals Corporation**  
**Mayville-Makwa Project**  
**Makwa Property**  
 Southern Manitoba, Canada  
**Plan View of Drill Hole Locations**  
 as of August, 2009

Drill Holes MM08-100 and MM08-103 Shown with Oval Outlines

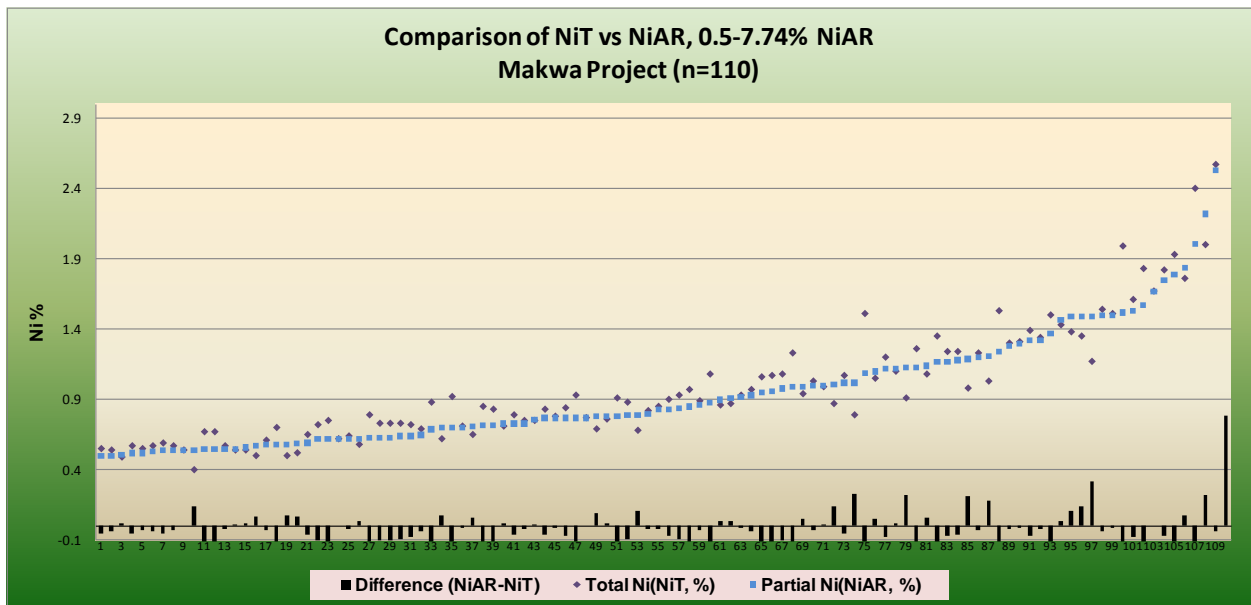
During the review of the assay information, it was discovered that different preparation methods were used in the determination of the nickel assays, by different laboratories and also over the time period since the first and last drilling was conducted. This resulted in nickel assays in the existing database being expressed as either total nickel (NiT, determined by four-acid digestion) or “partial nickel” (NiAR, determined by Aqua Regia digestion and predominately sulphide nickel). Examination of the assay information showed that the majority of the nickel assays in the database were determined using an Aqua Regia digestion; consequently the determination was made that the most cost-efficient corrective measure was to convert the NiT nickel assays to NiAR nickel assays. A program of re-assaying using the NiAR digestion method was conducted using as many of the sample pulps as could be found, which were anticipated to represent holes within the mineralization envelope. The database was amended with the results of these re-assayed samples accordingly. Unfortunately, the sample pulps from a number of samples could not be located, and RPA carried out a comparison of the nickel values for those samples in the database that had nickel assays determined by both methods. In all, 2,564 samples were found to have nickel values that were determined by both four-acid and three-acid digestions. This analysis showed that the average difference in the nickel assays between the two methods decreased as the nickel grade increased; consequently, RPA modified its analysis to examine the differences in the nickel values by NiAR nickel grade. Figure 14-4 presents a comparison of the difference in the nickel values for the 0.1% Ni to 0.49% Ni grade range, while Figure 14-5 presents a comparison of the difference for the 0.50% Ni to 7.74% Ni grade range.

Frequency histograms of the differences in nickel assays between the two digestion methods are presented in Figures 14-6 and 14-7. It can be seen that the average difference between the NiT and NiAR assays for the 0.1% NiAR to 0.49% NiAR grade range is 0.05% Ni while the average difference between NiT and NiAR for the 0.5% NiAR to 7.75% NiAR grade range is 0.03% Ni. As a result of this analysis, RPA applied a constant correction factor of negative 0.05% to 1,586 assays for which only NiT nickel assays were available as an estimate of the NiAR assay values.

**FIGURE 14-4 COMPARISON OF NiT VS. NiAR ASSAYS FOR THE 0.1-0.49% NiAR GRADE RANGE, MAKWA PROPERTY**

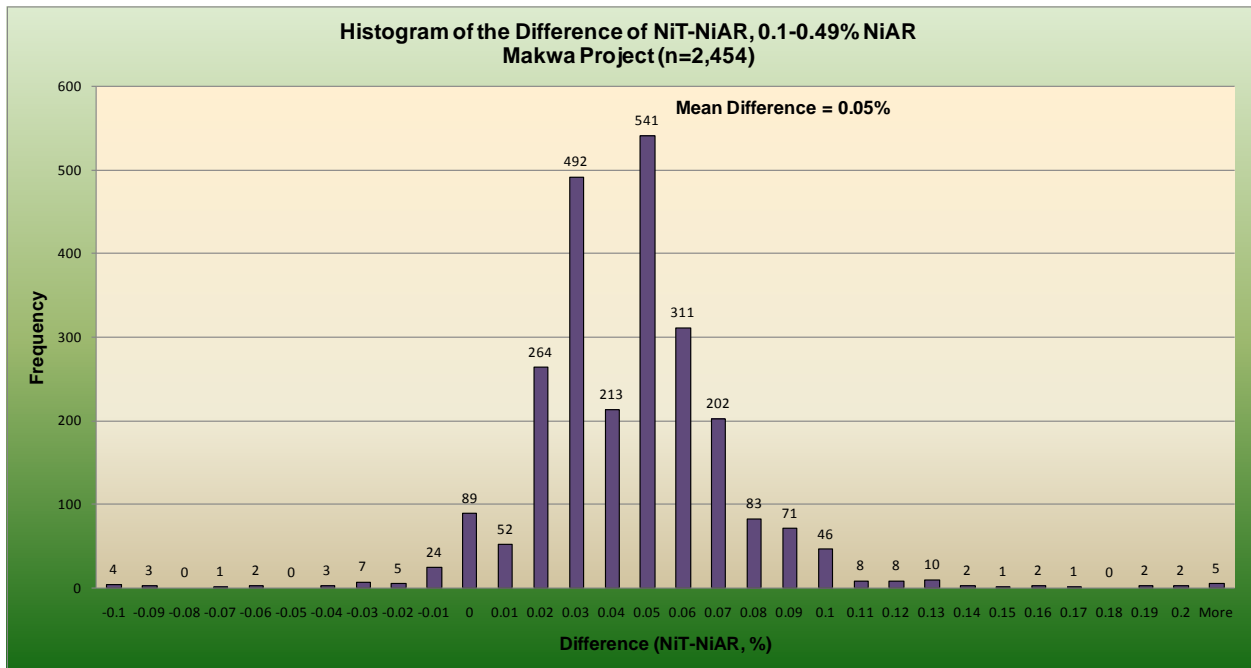


**FIGURE 14-5 COMPARISON OF NiT VS. NiAR ASSAYS FOR THE 0.5-7.74% NiAR GRADE RANGE, MAKWA PROPERTY**

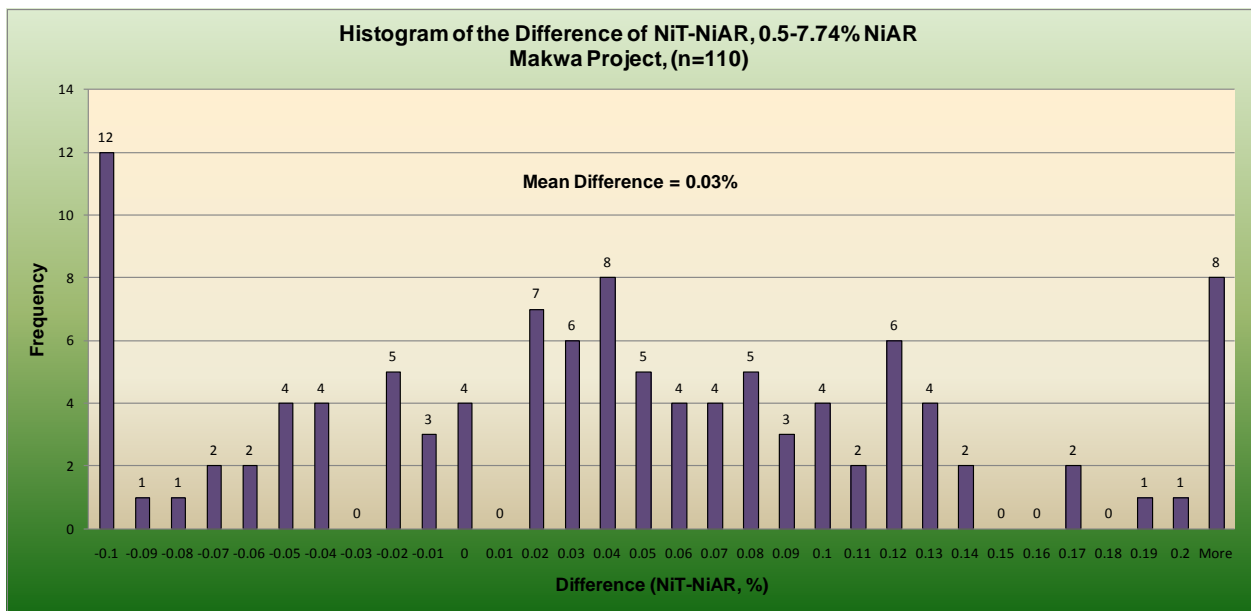




**FIGURE 14-6 HISTOGRAM OF THE DIFFERENCE OF THE 0.1-0.49% NIAR GRADE RANGE, MAKWA PROPERTY**



**FIGURE 14-7 HISTOGRAM OF THE DIFFERENCE OF THE 0.5-7.74% NIAR GRADE RANGE, MAKWA PROPERTY**

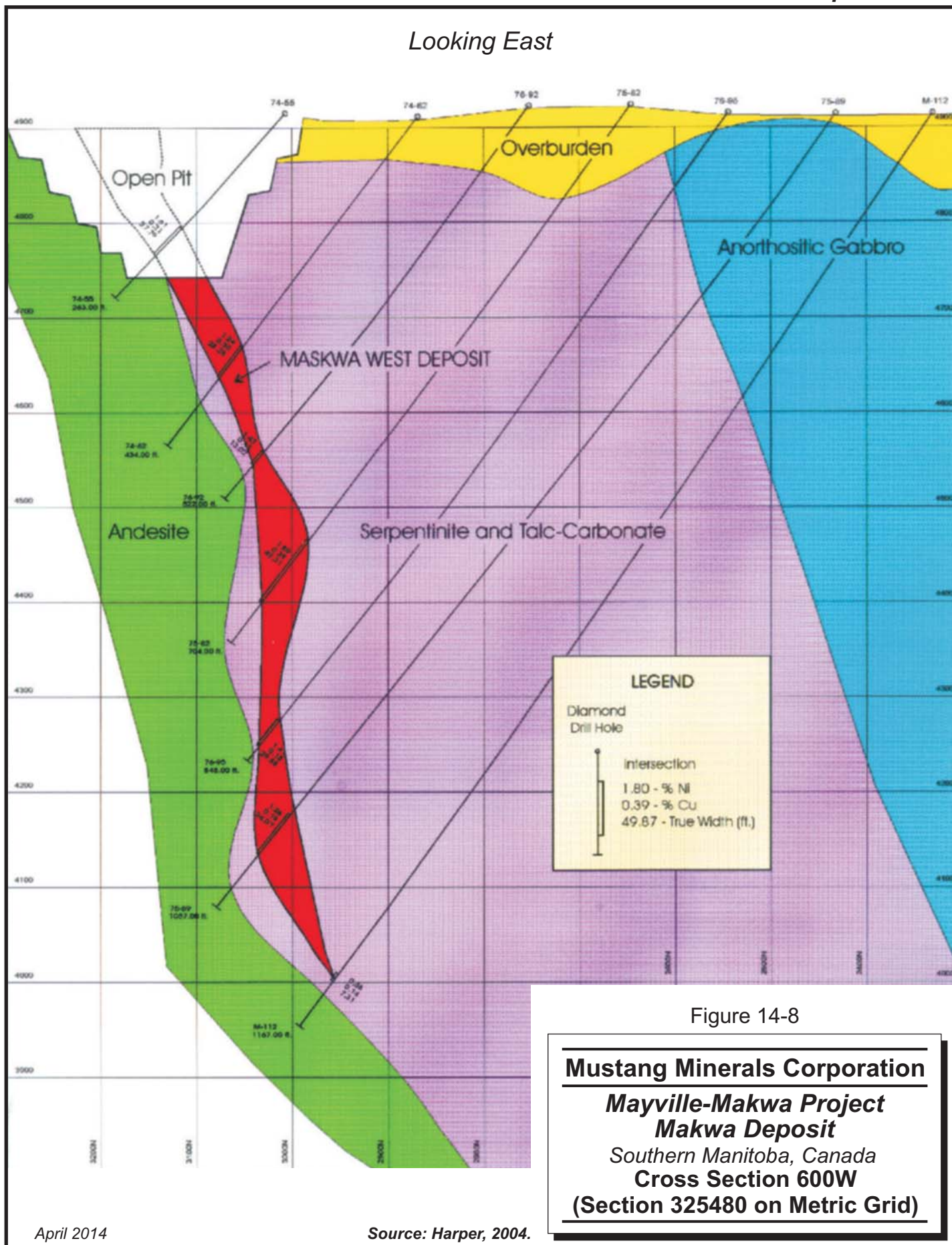


## **GEOLOGICAL, MINERALIZATION AND FAULT DOMAIN INTERPRETATIONS**

Interpretation of the geological and mineralization features associated with the nickel-copper-PGM mineralization found at the Makwa deposit was carried out according to the most current understanding and level of knowledge. Previous workers on the property (e.g., Harper, 2004) have interpreted the deposit as consisting of a lens of relatively high grade nickel mineralization that dips steeply to the southeast and is located along the north contact of an altered intrusion (sill) of ultramafic composition (Figure 14-8). Given the magmatic nature of this mineralization, RPA believes that this geometry implies that the former stratigraphic top of the intrusive system is to the southeast. The ultramafic sill is in contact with an anorthositic gabbro along its southeastern (stratigraphically upper) contact.

During the preparation of a model of the nickel-copper-PGM mineralization in support of a prefeasibility study completed in 2008, Duke et al. essentially reproduced the outline of the deposit using a minimum cut-off grade of 0.2% Ni, but also identified the possibility of the presence of additional low-grade nickel mineralization located in the hanging wall (i.e., stratigraphically above) of the main deposit lens. Additional sampling of available drill core by Mustang staff confirmed that additional low nickel values are indeed present.

On the basis of its review of the drill hole information and discussions carried out during the site visit, RPA agrees that the major host lithology consists of a steeply southeast dipping, assemblage of mafic and ultramafic metavolcanic rocks. From a regional perspective, the overall strike of the stratigraphic package is southwest-northeast and the facing directions (the direction in which the age of the rocks becomes younger) is to the southeast.



RPA began interpretation of the geology and mineralization found at the Makwa deposit by construction of a three-dimensional model of the lithologies found in the deposit area, and agrees in general with the scheme presented by Harper (2004). In general terms, these lithologies comprise a unit of mafic metavolcanic rocks that are located in the footwall of the nickel-copper-PGM mineralization. These mafic metavolcanic rocks are overlain by a sill of ultramafic intrusive rocks measuring approximately 150 m to 175 m in thickness that are in turn overlain by a unit of anorthositic gabbro. The thickness of this anorthositic gabbro unit remains unknown, as its southeastern contact has not been intersected by the available drill holes. The mafic metavolcanic rocks are also indicated to have thicknesses of approximately 150 m to 175 m and are in turn underlain by a second intrusive sill of ultramafic composition, which Mustang correlates with the unit that hosts the Dumbarton zone along strike to the northeast.

This general stratigraphic sequence remains valid in the area of the flooded open pit mine, between sections 325060 E to 325870E. Further to the east of section 325870E, the composition of the footwall unit of the mineralization is observed to change from mafic volcanic to a composition that is dominated by gabbro. Both of these footwall units are observed to be barren of nickel mineralization and have been found to have similar bulk densities; therefore, for simplicity, all of the footwall units were modelled as one single unit of mafic volcanic rocks. In many cases, the upper contact of the host ultramafic unit with the anorthositic gabbro was not intersected by drilling on every section. In these cases, a relatively constant thickness of the host ultramafic intrusion was assumed and the lithologic interpretation for that particular section was prepared accordingly.

Detailed examination of the lithologic codes and the assay values in the zones of nickel-copper-PGM mineralization showed that several styles of nickel mineralization could be observed in the drill hole information. Visual examination indicates that the nickel values associated with the geological code "SULP" are often of the order to two to three times the nickel values of the immediately adjacent samples. While no detailed descriptions of the various lithologic codes used to log the core during the various drilling programs over the years are available, RPA believes that the notation "SULP" refers to a visual observation of the presence of sulphide minerals by the logging geologist, consequently higher metal grades can be expected in these zones. On the basis of observations made during the site visit, RPA believes that the sulphide minerals will consist of varying proportions of pentlandite, chalcopyrite, and pyrrhotite such that some intervals of lower grade

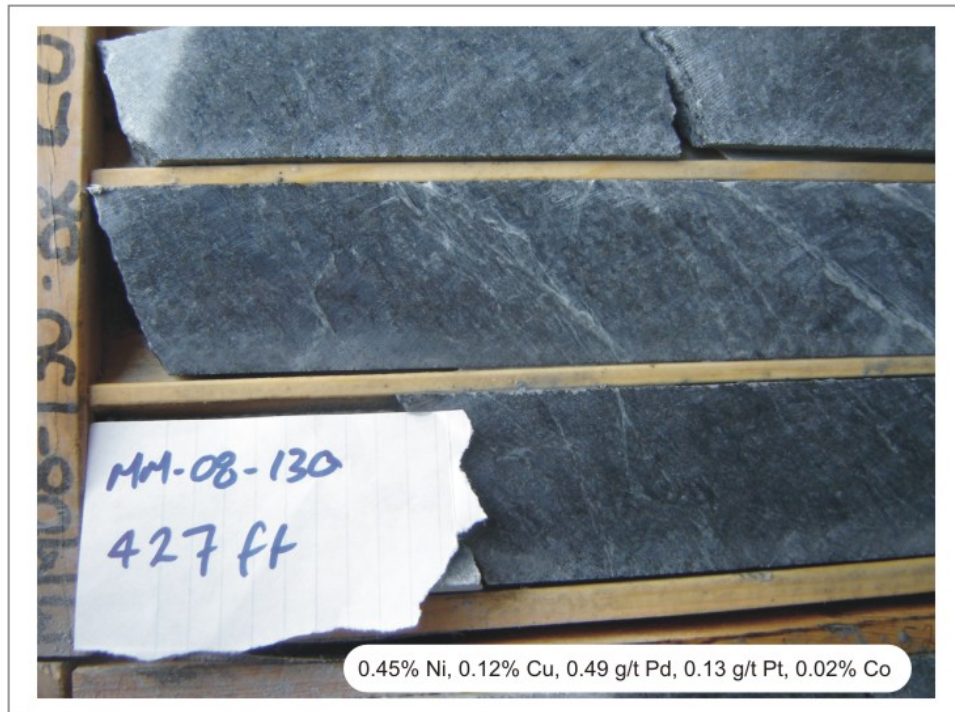
mineralization can be expected within pyrrhotite-rich “SULP” intervals. Examples of the varying styles of mineralization observed by RPA during the site visit are presented in Figures 14-9, 14-10, and 14-11.

RPA proceeded to prepare its interpretation of the mineralized intervals that, while based upon the overall setting as presented by Harper (2004), incorporated the results of additional information obtained from further drilling and sampling by Mustang. Upon review of this new information, RPA believes that the mineralization is most correctly modelled as a nickel-rich lens of semi-massive sulphides that have formed by sulphide-silicate segregation and gravity settling in depressions near the base of an ultramafic intrusion. This nickel-rich lens is surrounded by a lower grade zone of disseminated sulphides. Both the sulphide lens and disseminated mineralization are overlain by a lower grade interval of finely disseminated sulphides that have formed in the hangingwall to the main sulphide lens either due to continued segregation and settling, possible secondary mineralization due to deuteric alteration and hydrothermal movement, or as a result of a second pulse of nickel-bearing magma that has been intruded into the host ultramafic sill (Figure 14-12).

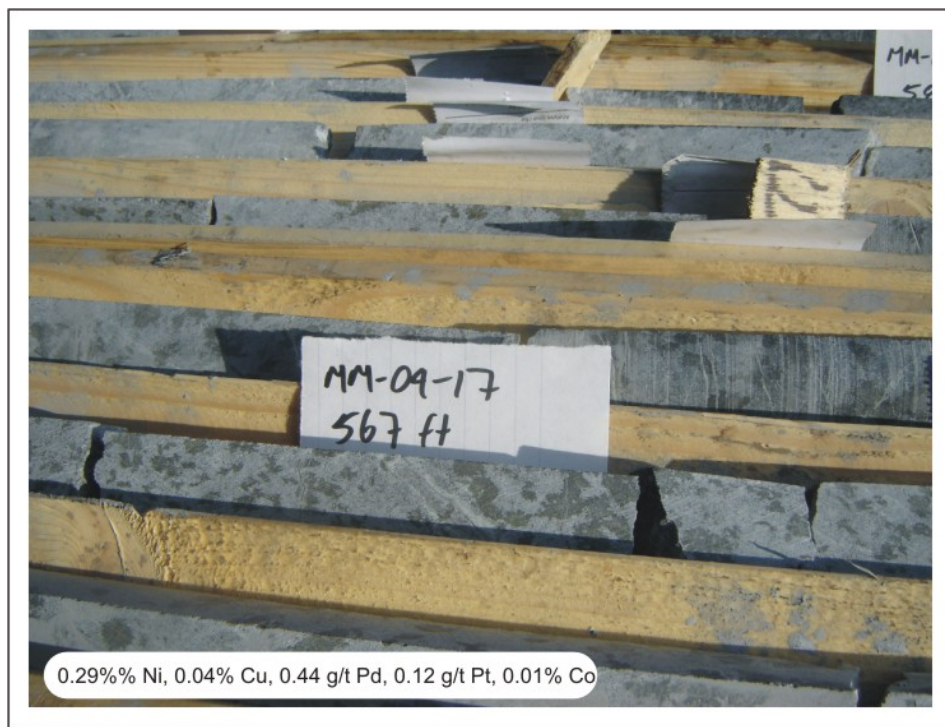
**FIGURE 14-9 VIEW OF HIGH GRADE NICKEL MINERALIZATION (SULPHIDE ZONE), DRILL HOLE MM04-14, MAKWA PROPERTY**



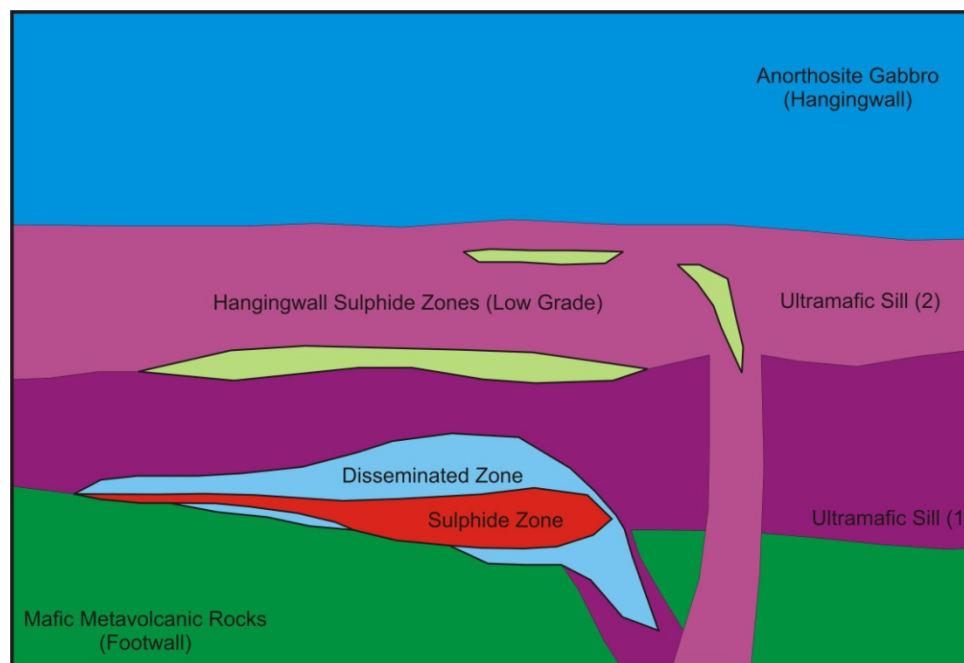
**FIGURE 14-10 VIEW OF MEDIUM GRADE NICKEL MINERALIZATION (DISSEMINATED ZONE, FOOTWALL), DRILL HOLE MM08-130, MAKWA PROPERTY**



**FIGURE 14-11 VIEW OF MEDIUM GRADE NICKEL MINERALIZATION (DISSEMINATED ZONE, HANGINGWALL), DRILL HOLE MM04-17, MAKWA DEPOSIT**



**FIGURE 14-12 SCHEMATIC ILLUSTRATION OF THE INTERPRETED RELATIONSHIPS OF THE MINERALIZED ZONES TO STRATIGRAPHY, MAKWA DEPOSIT**



In respect of the nickel mineralization, the nickel values were displayed on the drill hole traces and were used to establish the outline of the mineralized zone on cross-sections that were oriented in a north-south direction and spaced nominally at 30 m centres (viewing windows of  $\pm 15$  m). The nickel domains were drawn so as to include all occurrences of nickel values that were greater than the breakeven cut-off grade of 0.16% Ni, irrespective of the quantity of sulphides present (i.e., inclusive of massive, semi-massive, stringer, and disseminated sulphide mineralization). In cases where lithological information indicated the presence of metre-scale barren felsic intrusions or other zones of below-cut-off material, these small sections were included with the initial domain model as internal dilution. In the cases where a portion of the drill hole contained within a mineralized wireframe did not have any assay values, zero values were manually entered into the database for those intervals.

The locations of all lithological and mineralized contacts were “snapped” to the observed location in the individual drill holes such that the sectional interpretations “wobbled” in three dimensional space, to either side of the section plane. In the cases where the limit of mineralization was identified by a neighbouring drill hole, the interpretation of the mineralized domain was extended half of the distance to the next drill hole. In the cases where the limit of the mineralization was not identified by drilling (i.e., either along the down-dip or along-

strike projections), the interpretation of the mineralized domain was extended 30 m along that direction. An example of the results of the lithologic and mineralization modelling in cross sectional view is presented in Figure 14-13. The limits and orientations of the resulting solid models of the mineralized domain are presented in plan and longitudinal views in Figures 14-14 and 14-15, respectively.

It can be seen that the mineralization for the Makwa deposit has been identified along a strike length of approximately 1,000 m and to a vertical depth of approximately 350 m beneath the surface. The mineralization is seen to have an overall strike of azimuth 065° and dips steeply to the southeast at dips ranging from -70° to -90°. RPA notes that the depth extents of the favourable host ultramafic unit clearly have not been tested by diamond drilling on an intermittent basis only below a depth of 350 m.



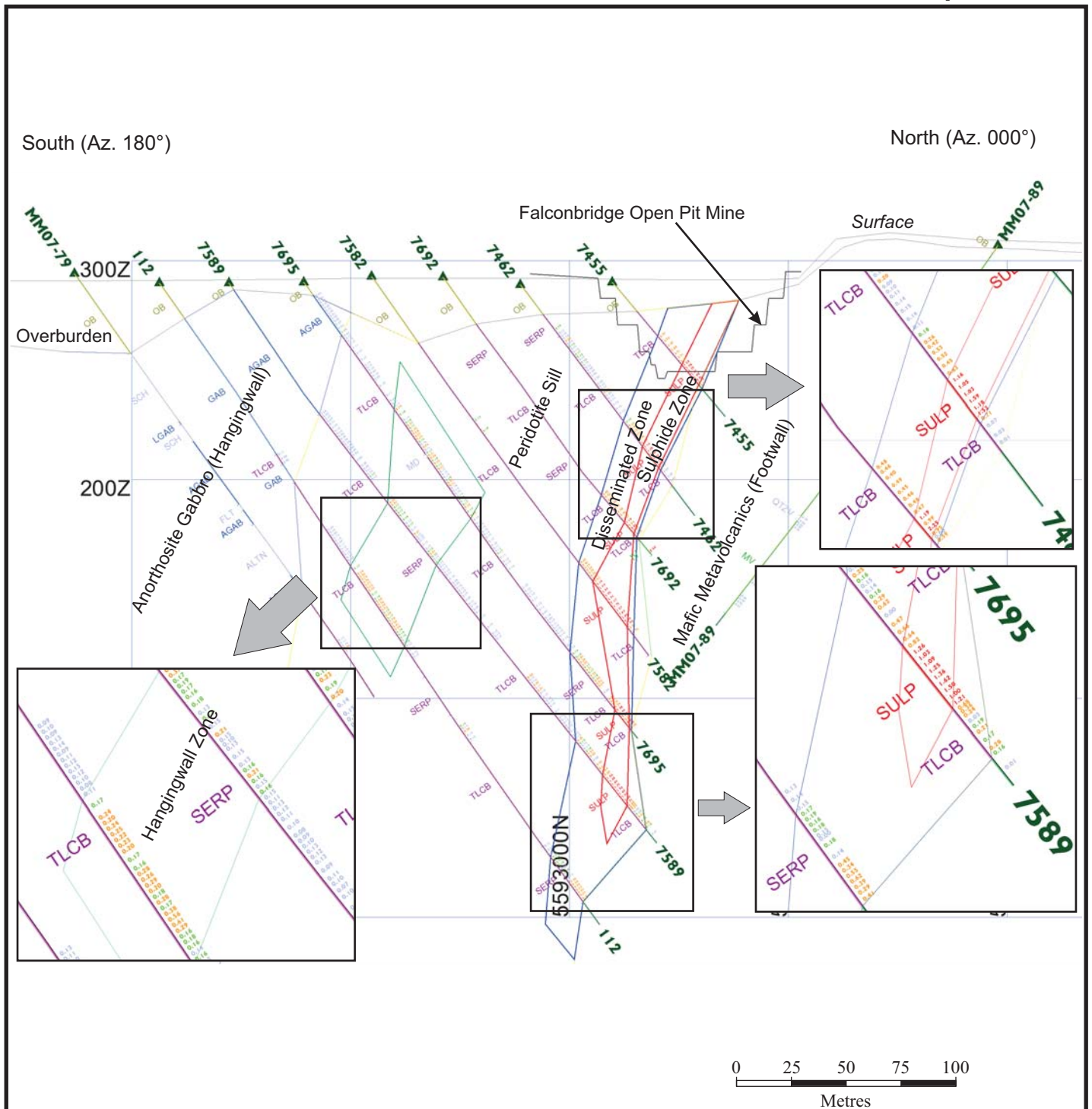


Figure 14-13

**Mustang Minerals Corporation**  
**Mayville-Makwa Project**  
**Makwa Deposit**  
 Southern Manitoba, Canada  
**Cross Section 325480 E**  
**Looking West**

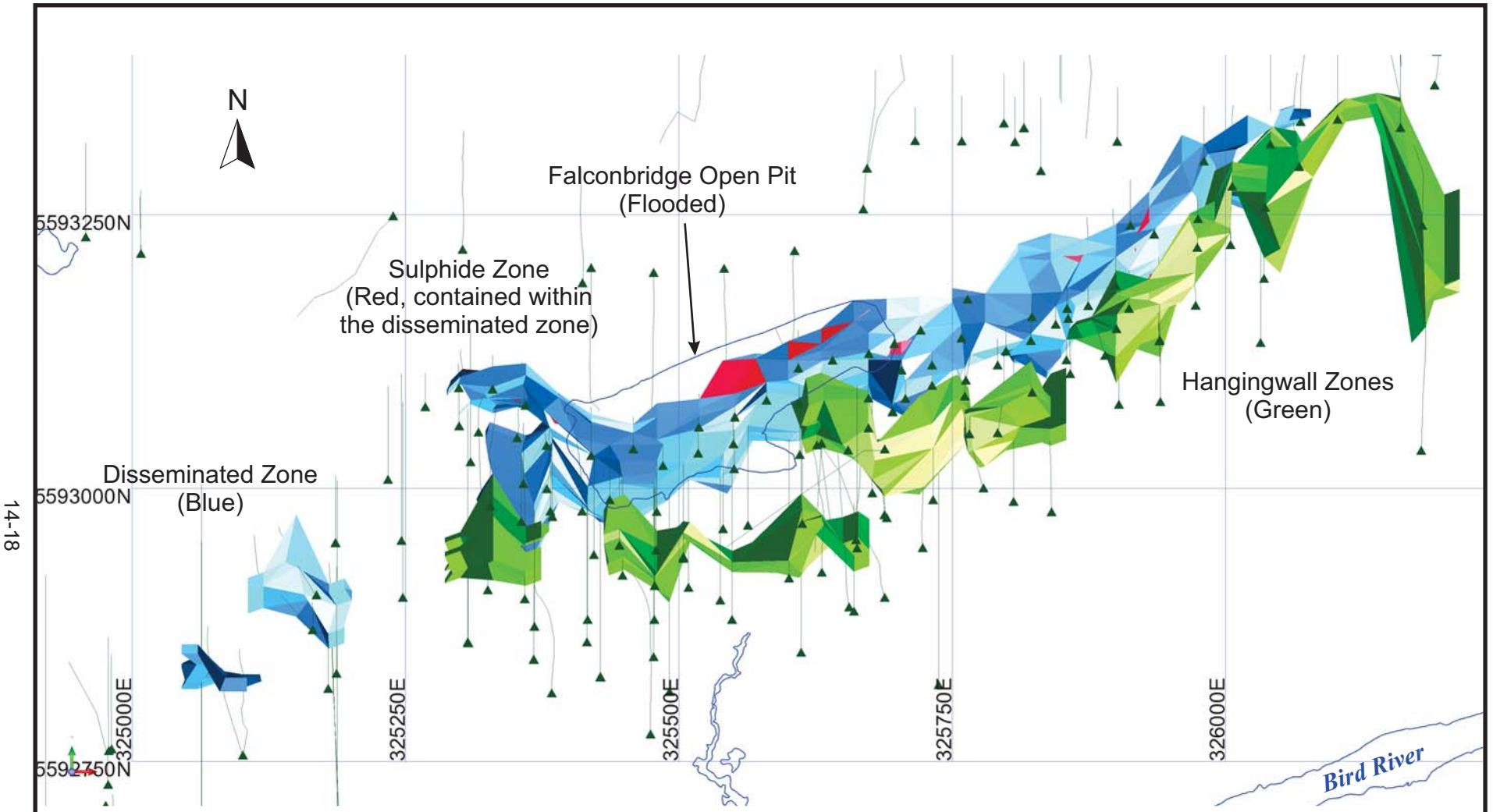


Figure 14-14

**Mustang Minerals Corporation**  
**Mayville-Makwa Project**  
**Makwa Deposit**  
Southern Manitoba, Canada  
**Plan View of the Mineralized**  
**Domain Solid Models**

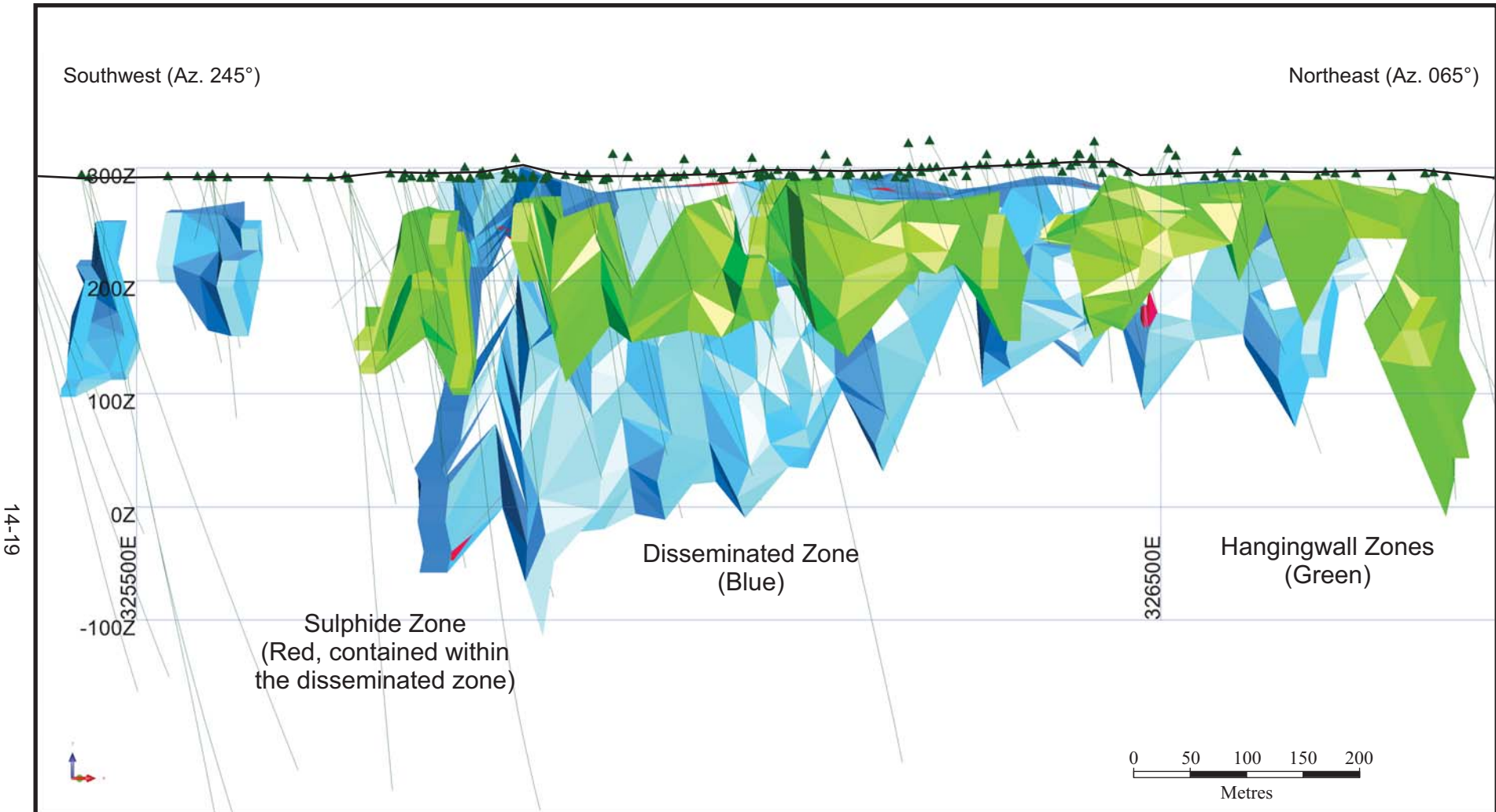


Figure 14-15

**Mustang Minerals Corporation**  
**Mayville-Makwa Project**  
**Makwa Deposit**  
Southern Manitoba, Canada  
**Longitudinal View of the Mineralized Domain Solid Models**

## **CUT-OFF GRADE**

For the purposes of this report, an operating scenario was developed wherein nickel-bearing material was contemplated to be excavated using open pit mining methods. The material was to be processed at a plant, which employs a flowsheet incorporating a flotation process to generate a nickel-rich sulphide concentrate. This concentrate would then be transported to a domestic smelting/refining complex for extraction of the individual payable metals.

The price of nickel is cyclical, responding to the supply and demand relationship and influenced to a degree by market speculation and technical analyses. The nickel metal prices have varied widely since the year 2000. Given the cyclical nature of metal prices, it is not reasonable to utilize the metal price at any one point in time, as it is certain that the price will change in the future. While history has shown that it is impossible to accurately predict what the future metal prices will be, a reasonable alternative is to utilize the average metal price over a specified time period rather than using the metal prices at the close of any particular business day.

In the absence of a more formal metal price forecast, a second alternative is to select a metal price on a cost-of-production basis. On this basis, RPA believes that an appropriate choice of a long-term nickel price for the purposes of this Mineral Resource estimate is US\$8.50/lb. Metal prices for the remaining metals contained within this deposit are presented in Table 14-3.

Given the advanced stage of the Project's history, the completion of a prefeasibility study in 2008, and extensive metallurgical testing in 2009, sufficient information is available to use many of the important input parameters required to prepare a reasonable cut-off grade estimate. These would include operating costs for mining, processing, and general and administration, metallurgical recovery, smelter accountabilities, freight and refining charges, and the like, in respect of a potential open pit mining operation.

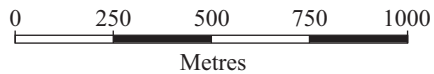
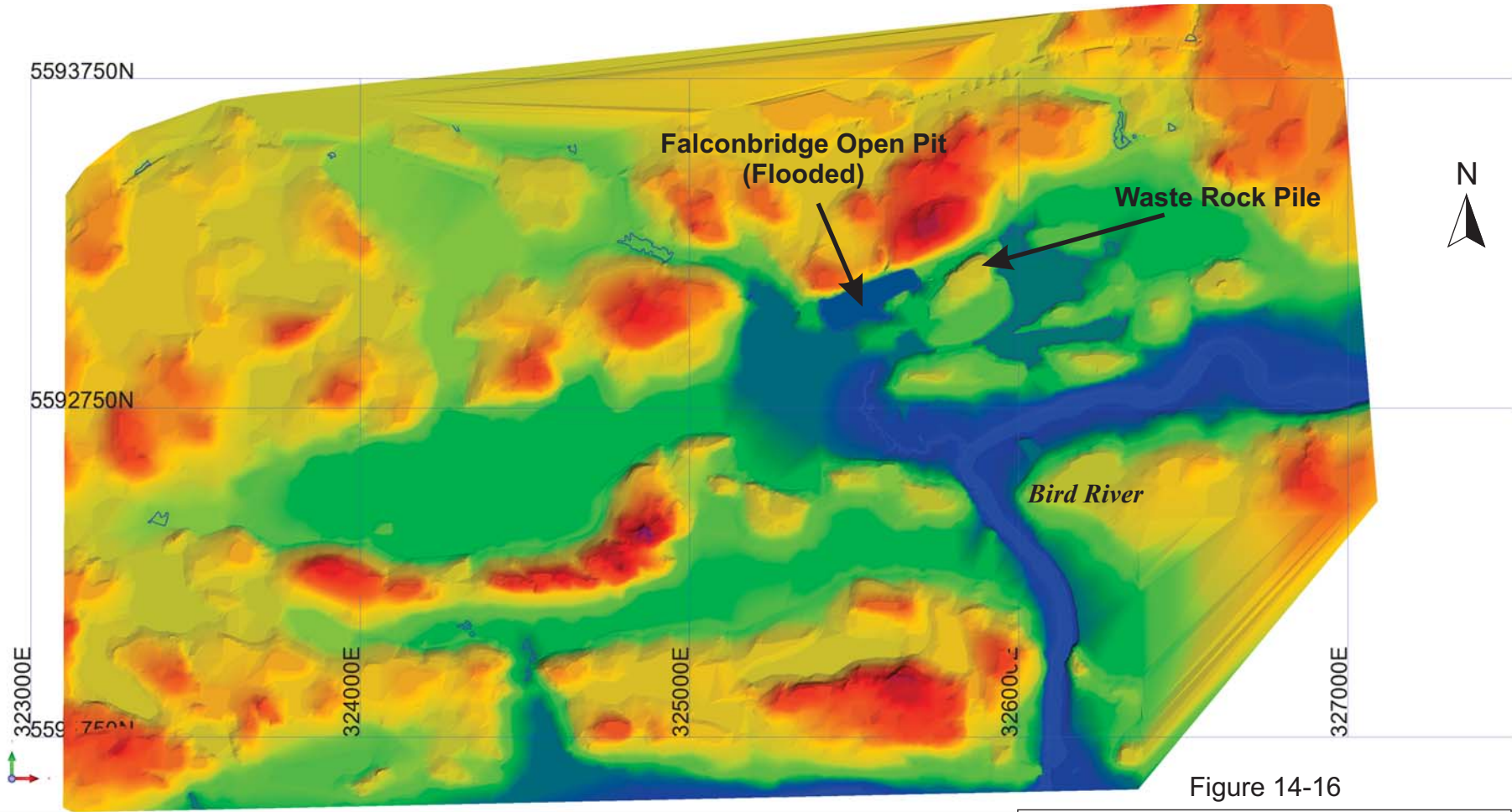
**TABLE 14-3 SUMMARY OF THE INPUT PARAMETERS USED IN ESTIMATION OF A CUT-OFF GRADE AND OPEN PIT OPTIMIZATION, MAKWA DEPOSIT  
Mustang Minerals Corp. – Makwa-Mayville Project**

Item	Sept 2009 Revised	Source
Nickel (US\$/lb)	\$8.50	RPA Long Term
Copper (US\$/lb)	\$3.40	Assumptions
Palladium (US\$/oz)	\$800	
Platinum (US\$/oz)	\$1,800	
Cobalt (US\$/lb)	\$14.00	
Exchange Rate (US\$/C\$)	0.97	

For the purposes of construction of domain models, RPA determined that a cut-off grade of 0.16% Ni is appropriate as it represents typical mineralization with a calculated NSR value close to the estimated Project operating cost.

### **TOPOGRAPHIC SURFACE**

A detailed digital topographic surface was created by Eagle Mapping in 2007 for use in the prefeasibility study. This surface was prepared from ortho-corrected aerial photographs to a one metre level of accuracy using the NAD83, Zone 15 datum and local topographic control points as appropriate. The information was provided to RPA in digital format and was found to cover a large area that included the proposed open pit mine (Figure 14-16).



**Mustang Minerals Corporation**  
**Mayville-Makwa Project**  
**Makwa Property**  
Southern Manitoba, Canada  
**Coloured Topographic Map**  
**of the Makwa Deposit**

## **HISTORICAL MINED OUT SURFACE**

Falconbridge operated an open pit mine during the early 1970s from which the nickel-bearing material was shipped offsite for processing. A copy of a survey plan was discovered in the project files during the RPA site visit that portrayed the as-mined surface near the end of the open pit mine's life. An image of this survey plan is presented in Figure 14-2 earlier in this section.

RPA created a digital model of the Falconbridge open pit mine using the information contained in this survey plan by first digitizing the relevant information such as toes, crests, and ramp locations. The transformation from Imperial to metric units was then carried out according to the procedure described above. The resulting digital model was compared to the location of the open pit mine as determined by the newly acquired digital topographic information (Figure 14-17). It can be seen that a very good fit was achieved.

## **GRADE CAPPING**

Grade capping (or top cutting) was investigated on the raw nickel, copper, palladium, platinum, and cobalt assay values in order to ensure that the possible influence of erratic high values did not unduly bias the grade estimate. All samples contained within the three-dimensional models (Sulphide Zone – Code 402, Disseminated Zone – Code 407, and Hangingwall Zone – Code 403) of the Makwa 0.16% Ni domain models were coded in the database and extracted for analysis.

Normal histograms were generated from these extraction files and the descriptive statistics of the sample data set were generated. The grade cap for each metal, for each separate zone, was selected by examining the histograms for the grade at which outlier assays begin to occur. A comparison of the descriptive statistics for the capped and uncapped raw nickel, copper, palladium, platinum and cobalt assays, along with the capping values, is presented in Table 14-4.

**TABLE 14-4 SUMMARY STATISTICS FOR THE RAW AND CAPPED ASSAY SAMPLES FOR THE SULPHIDE, DISSEMINATED AND HANGINGWALL ZONES, MAKWA DEPOSIT**  
**Mustang Minerals Corp. – Makwa-Mayville Project**

Descriptive Statistics	Nickel		Copper		Palladium		Platinum		Cobalt	
	Raw	Capped	Raw	Capped	Raw	Capped	Raw	Capped	Raw	Capped
<b>Sulphide Zone (402):</b>										
<b>Capping Values</b>	<b>2.7% Ni</b>		<b>0.8% Cu</b>		<b>2.4 g/t Pd</b>		<b>1.2 g/t Pt</b>		<b>0.10% Co</b>	
Arithmetic Mean	0.99	0.98	0.18	0.18	0.67	0.65	0.17	0.17	0.022	0.022
Length-Weighted Mean	1.02	1.02	0.18	0.18	0.63	0.61	0.16	0.16	0.020	0.020
Standard Error	0.02	0.02	0.01	0.00	0.02	0.02	0.01	0.01	0.001	0.001
Median	0.99	0.99	0.14	0.14	0.53	0.53	0.14	0.14	0.020	0.020
Mode	0.25	0.25	0.12	0.12	0.00	0.00	0.00	0.00	0.000	0.000
Standard Deviation	0.60	0.55	0.14	0.14	0.70	0.58	0.18	0.17	0.018	0.017
Coefficient of Variation-Arithmetic	0.60	0.56	0.81	0.77	1.05	0.89	1.08	1.02	0.838	0.790
Coefficient of Variation-Weighted	0.58	0.54	0.79	0.76	1.11	0.94	1.12	1.06	0.895	0.838
Sample Variance	0.36	0.30	0.02	0.02	0.49	0.33	0.03	0.03	0.000	0.000
Kurtosis	5.29	0.00	9.30	5.28	27.45	-0.05	22.00	7.39	17.64	1.292
Skewness	1.30	0.48	2.46	1.98	3.27	0.75	3.16	2.09	2.125	0.760
Range	5.31	2.69	1.12	0.80	8.96	2.40	2.18	1.20	0.220	0.100
Minimum	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Maximum	5.32	2.70	1.12	0.80	8.96	2.40	2.18	1.20	0.220	0.100
Sum	797.88	789.41	142.09	140.95	537.04	518.71	136.64	135.66	17.40	17.280
Count	803	803	803	803	802	803	802	803	802	803
<b>Disseminated Zone (407):</b>										
<b>Capping Values</b>	<b>1.8% Ni</b>		<b>0.7% Cu</b>		<b>2.0 g/t Pd</b>		<b>0.6 g/t Pt</b>		<b>0.08% Co</b>	
Arithmetic Mean	0.33	0.32	0.09	0.08	0.23	0.23	0.07	0.07	0.014	0.014
Length-Weighted Mean	0.32	0.31	0.08	0.08	0.21	0.21	0.06	0.06	0.013	0.013
Standard Error	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.000	0.000
Median	0.26	0.26	0.06	0.06	0.17	0.17	0.05	0.05	0.010	0.010
Mode	0.18	0.18	0.01	0.01	0.00	0.00	0.00	0.00	0.010	0.010
Standard Deviation	0.30	0.22	0.16	0.09	0.34	0.24	0.08	0.07	0.012	0.009
Coefficient of Variation-Arithmetic	0.92	0.68	1.83	1.08	1.43	1.06	1.14	1.01	0.831	0.682



Descriptive Statistics	Nickel		Copper		Palladium		Platinum		Cobalt	
	Raw	Capped	Raw	Capped	Raw	Capped	Raw	Capped	Raw	Capped
Coefficient of Variation-Weighted	0.95	0.69	1.98	1.12	1.58	1.14	1.24	1.08	0.925	0.746
Sample Variance	0.09	0.05	0.02	0.01	0.11	0.06	0.01	0.00	0.000	0.000
Kurtosis	214.96	10.53	322.19	15.06	451.97	9.52	74.16	11.24	85.198	10.378
Skewness	10.83	2.50	15.15	3.09	15.48	2.30	5.91	2.41	6.455	1.923
Range	7.74	1.80	4.04	0.70	10.98	2.00	1.33	0.60	0.220	0.080
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Maximum	7.74	1.80	4.04	0.70	10.98	2.00	1.33	0.60	0.220	0.080
Sum	812.46	797.03	213.27	201.13	573.02	560.92	167.60	165.27	34.930	34.390
Count	2,472	2,472	2,472	2,472	2,447	2,472	2,447	2,472	2,465	2,472
<b>Hangingwall Zone (403):</b>										
<b>Capping Values</b>	<b>1.1% Ni</b>		<b>0.6% Cu</b>		<b>Nil</b>		<b>0.3 g/t Pt</b>		<b>0.07% Co</b>	
Arithmetic Mean	0.21	0.20	0.05	0.04	0.09	---	0.03	0.03	0.013	0.013
Length-Weighted Mean	0.20	0.20	0.04	0.04	0.09	---	0.03	0.03	0.013	0.013
Standard Error	0.00	0.00	0.00	0.00	0.00	---	0.00	0.00	0.000	0.000
Median	0.18	0.18	0.01	0.01	0.05	---	0.02	0.02	0.010	0.010
Mode	0.17	0.17	0.01	0.01	0.00	---	0.01	0.01	0.010	0.010
Standard Deviation	0.12	0.10	0.16	0.08	0.11	---	0.05	0.04	0.010	0.007
Coefficient of Variation-Arithmetic	0.57	0.50	3.38	1.81	1.23	---	1.42	1.07	0.753	0.516
Coefficient of Variation-Weighted	0.59	0.51	4.00	1.97	1.27	---	1.50	1.12	0.790	0.536
Sample Variance	0.01	0.01	0.03	0.01	0.01	---	0.00	0.00	0.000	0.000
Kurtosis	79.37	29.85	299.55	29.41	5.79	---	363.59	7.48	237.40	24.97
Skewness	6.93	4.23	15.45	4.75	2.02	---	13.77	2.07	12.380	3.782
Range	2.07	1.10	3.64	0.65	0.90	---	1.37	0.30	0.250	0.070
Minimum	0.00	0.00	0.00	0.00	0.00	---	0.00	0.00	0.000	0.000
Maximum	2.07	1.10	3.64	0.65	0.90	---	1.37	0.30	0.250	0.070
Sum	341.62	339.15	79.39	69.07	149.75	---	56.05	54.98	22.29	21.90
Count	1,655	1,655	1,655	1,655	1,655	---	1,655	1,655	1,655	1,655

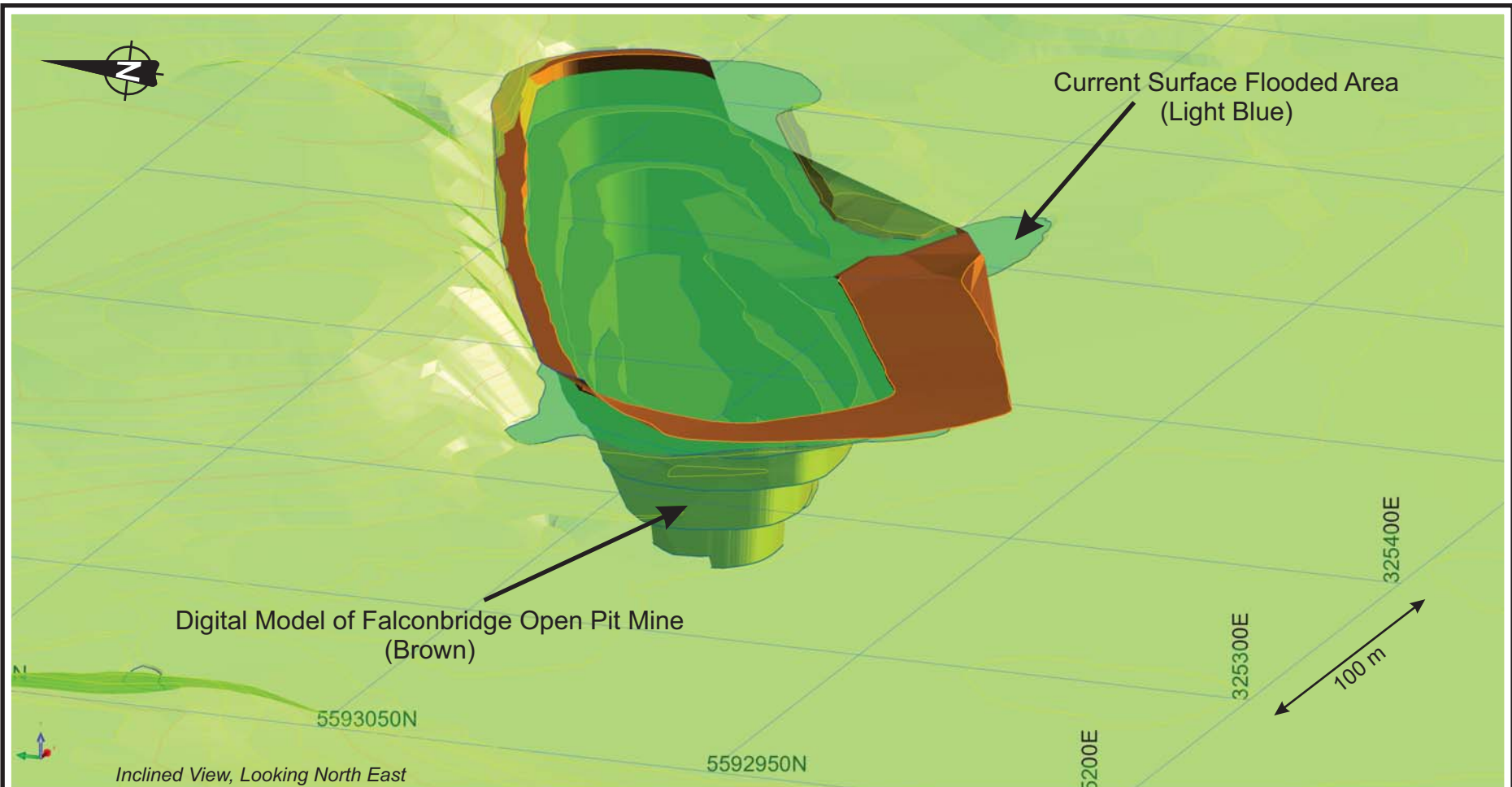


Figure 14-17

**Mustang Minerals Corporation**  
**Mayville-Makwa Project**  
**Makwa Property**  
Southern Manitoba, Canada  
**Comparison of Makwa Digital Open Pit Mine Model to Surface Topography**

## COMPOSITING METHODS

RPA examined the distribution of the lengths of the samples contained within the Makwa deposit 0.16% Ni domain models (Figure 14-18). RPA considered such items as the distribution of raw sample lengths, the relation of the sample lengths to the width of the mineralization, to the anticipated block sizes, and search ellipse criteria that would be utilized for the construction of the grade-block model, and is of the opinion that a composite length of 2.5 m is appropriate for use in resource estimation work.

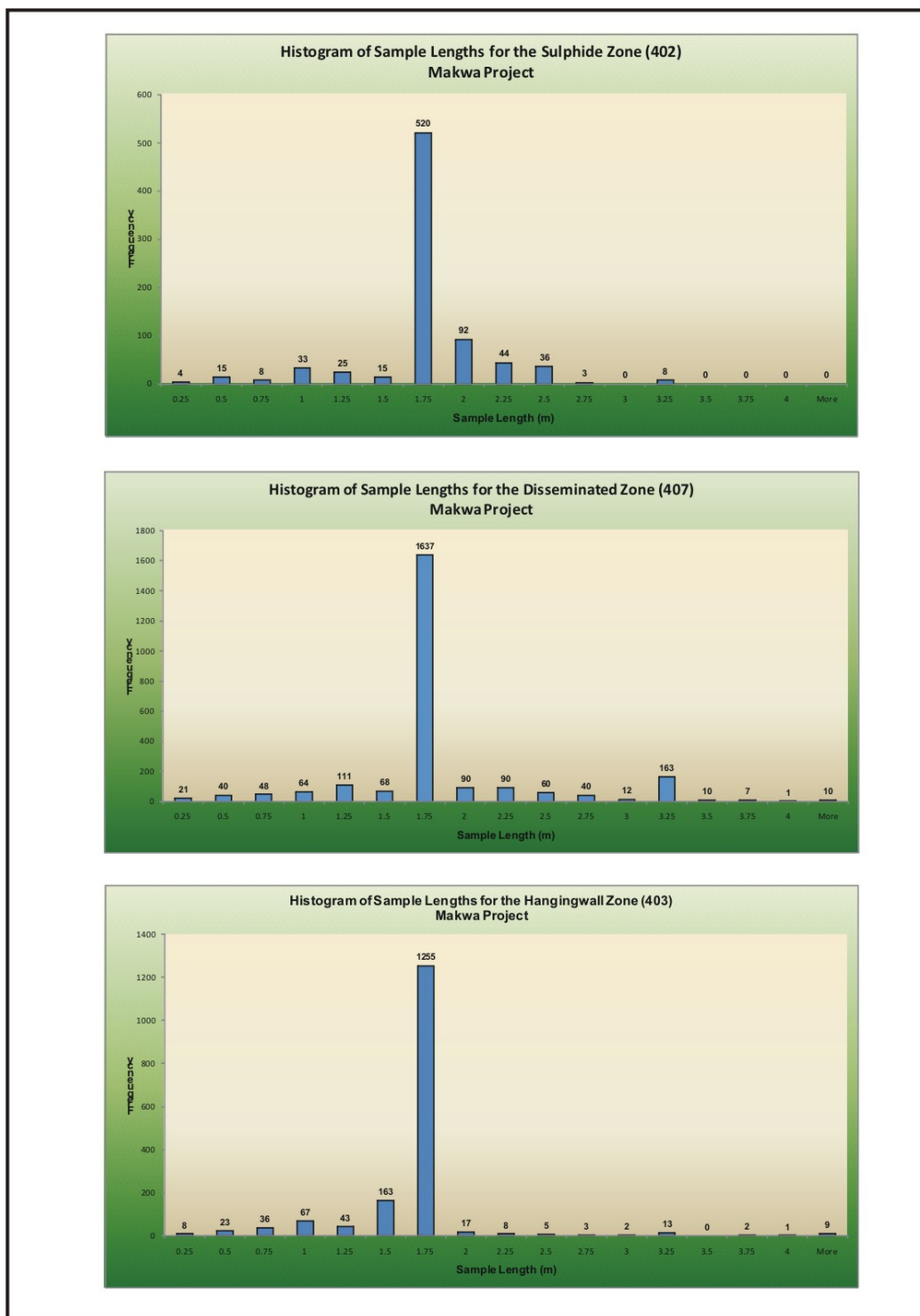
All samples of the uncapped and capped nickel, copper, palladium, platinum, and cobalt assays were composited to an equal length of 2.5 m using the down hole compositing function of the Gemcom-Surpac mine modelling software. In this function, compositing begins at the point in a drill hole at which the zone of interest is encountered and continues down the length of the hole until the end of the zone is reached. As often happens, the thickness of the mineralized zone encountered by any given drill hole is not an even multiple of the composite length. In these cases, if the remaining length was 75% or greater of the composite length (in this case 1.88 m), the composite was accepted as part of the data set. The remaining sample lengths less than 75% of the composite length were discarded from consideration. The descriptive statistics of the capped, composited samples are presented in Table 14-5.

**TABLE 14-5 SUMMARY STATISTICS FOR THE 2.5 M UNCAPPED AND CAPPED, COMPOSITED SAMPLES FOR THE SULPHIDE, DISSEMINATED AND HANGINGWALL DOMAIN MODELS, MAKWA DEPOSIT  
Mustang Minerals Corp. – Makwa-Mayville Project**

Descriptive Statistics	Nickel		Copper		Palladium		Platinum		Cobalt	
	Raw	Capped	Raw	Capped	Raw	Capped	Raw	Capped	Raw	Capped
<b>Sulphide Zone (402):</b>										
Mean	1.03	1.03	0.18	0.18	0.64	0.62	0.17	0.16	0.020	0.020
Standard Error	0.02	0.02	0.01	0.01	0.03	0.02	0.01	0.01	0.001	0.001
Median	1.05	1.05	0.16	0.16	0.56	0.56	0.14	0.14	0.020	0.020
Mode	0.66	0.66	0.12	0.12	0.00	0.00	0.00	0.00	0.000	0.000
Standard Deviation	0.51	0.49	0.12	0.11	0.60	0.54	0.17	0.16	0.016	0.016
Co-efficient of Variation	0.49	0.47	0.64	0.63	0.95	0.87	1.01	0.98	0.783	0.783
Sample Variance	0.26	0.24	0.01	0.01	0.36	0.29	0.03	0.03	0.000	0.000
Kurtosis	1.88	-0.24	3.64	3.14	5.07	-0.63	6.67	4.60	-0.111	-0.111
Skewness	0.56	0.14	1.59	1.50	1.42	0.47	1.90	1.62	0.340	0.340
Range	3.61	2.59	0.75	0.69	4.57	2.40	1.22	0.97	0.089	0.089

Descriptive Statistics	Nickel		Copper		Palladium		Platinum		Cobalt	
	Raw	Capped	Raw	Capped	Raw	Capped	Raw	Capped	Raw	Capped
Minimum	0.11	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Maximum	3.71	2.70	0.75	0.69	4.57	2.40	1.22	0.97	0.089	0.089
Sum	492.67	490.08	86.30	85.87	304.43	295.79	79.04	78.44	9.713	9.713
Count	477	477	477	477	477	477	477	477	477	477
<b>Disseminated Zone (407):</b>										
Mean	0.31	0.31	0.08	0.08	0.21	0.21	0.06	0.06	0.013	0.013
Standard Error	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.000	0.000
Median	0.27	0.27	0.07	0.07	0.17	0.16	0.05	0.05	0.012	0.012
Mode	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.010	0.010
Standard Deviation	0.18	0.18	0.07	0.07	0.20	0.20	0.06	0.06	0.008	0.008
Co-efficient of Variation	0.56	0.56	0.92	0.86	0.95	0.96	0.93	0.92	0.610	0.613
Sample Variance	0.03	0.03	0.01	0.00	0.04	0.04	0.00	0.00	0.000	0.000
Kurtosis	3.63	3.58	14.92	6.13	2.29	2.30	10.36	3.27	0.310	0.301
Skewness	1.36	1.33	2.71	1.87	1.32	1.32	1.86	1.35	0.110	0.109
Range	1.52	1.52	0.80	0.55	1.27	1.27	0.70	0.48	0.052	0.052
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Maximum	1.52	1.52	0.80	0.55	1.27	1.27	0.70	0.48	0.052	0.052
Sum	499.71	498.52	125.47	123.51	330.84	329.58	98.35	97.67	20.221	20.191
Count	1,591	1,591	1,591	1,591	1,581	1,591	1,581	1,591	1,586	1,591
<b>Hangingwall Zone (403):</b>										
Mean	0.20	0.20	0.04	0.04	0.09	0.09	0.03	0.03	0.013	0.013
Standard Error	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Median	0.19	0.19	0.02	0.02	0.06	0.06	0.03	0.03	0.010	0.010
Mode	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.010	0.010
Standard Deviation	0.08	0.08	0.06	0.05	0.09	0.09	0.03	0.03	0.006	0.005
Co-efficient of Variation	0.40	0.39	1.58	1.35	1.08	1.08	0.95	0.93	0.434	0.392
Sample Variance	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.000	0.000
Kurtosis	26.23	22.52	34.74	16.46	3.65	3.65	4.80	3.33	34.677	19.151
Skewness	3.02	2.68	4.89	3.37	1.57	1.57	1.62	1.43	3.777	2.383
Range	1.15	1.08	0.75	0.51	0.73	0.73	0.24	0.21	0.076	0.064
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Maximum	1.15	1.08	0.75	0.51	0.73	0.73	0.24	0.21	0.076	0.064
Sum	193.60	193.06	39.26	37.07	85.19	85.19	31.13	30.96	12.403	12.311
Count	967	967	967	967	967	967	967	967	967	967

**FIGURE 14-18 FREQUENCY HISTOGRAM OF THE RAW ASSAY SAMPLE LENGTHS FOR THE SULPHIDE, DISSEMINATED AND HANGINGWALL ZONES, MAKWA DEPOSIT**



## SPECIFIC GRAVITY

Values for specific gravity of the mineralization were determined by the Mustang field staff as described in the excerpt from Ward (2009):

A significant program to measure specific gravity on original core samples was conducted in November and December 2008, at the suggestion of Mr. Pressacco, at the start of the feasibility study resource estimating process.

MMC [Mustang] staff determined SG values from almost all pieces of rock in a total of 21 randomly selected cores dating from the [2004] through [2007] drilling. Each sample or core was weighed in air and in water to determine SG by the value of “Weight in air/(Weight in air – Weight in water)” using a water bath, wire cage and digital scale. This formula assumes that the SG of water is 1.00. The scale was tared between each measurement.

SG values were determined for a total of 1535 core intervals. Considering that intervals commonly comprised between 4 and 8 pieces of rock, this indicates a superlative effort by the MMC personnel. The SG for each interval was calculated as the arithmetic average of the values determined for the individual pieces within that interval, which could be seen as imprecise but the only practical method with the irregularly shaped pieces. Furthermore, with the significantly sized sample population, errors derived from skewing of data within each interval tend to be mitigated. During the transfer of the raw data to the database, [Ward] noticed a number of obvious errors within the intervals or outliers, and removed these from the calculation used for each interval SG. Outliers [Ward] considered to be values below 2.5 and above 3.5. Finally [Ward] removed one entry with over 5% Ni and SG 3.1, since it skewed the overall population. As a check, the SG of the total population within the ultramafic zone for which assays were available (1063 intervals), was determined by straight average (2.856) and by weighted average (2.852) based on sample interval lengths. The similarity of these values indicates that the treatment is valid.

For each core interval, named according to the database sample number, the corresponding nickel content has been compared (using the “accepted nickel” value). All other intervals, which were not assayed are grouped according to the core logs as ultramafic, hanging wall rock or foot wall rock, for the purpose of determining the SG of these materials. In many drill holes the last few samples are logged as volcanic and therefore these samples were also grouped with the foot wall SG values, even when assayed. A spreadsheet containing the full database information for those holes studied, and data examination, is attached.

A random selection of sample pulps held by TSL was submitted to Accurassay to determine SG by the pycnometer method, involving measured displacement of water. Several pulps went missing and several had no comparison with the samples measured by MMC, resulting in comparative data from 42 samples. Note again that the MMC measurement for a particular sample is the average of the individual results of each piece of rock within the interval, whereas the pulp SG represents a true average of the interval. Analysis of the results shows that on average the MMC value is extremely close, at 2.87, to the average from Accurassay at 2.86, though there are some extreme variations on some individual samples, likely influenced by the MMC procedure.”

These newly acquired SG measurements were merged with the existing SG values in the drill hole database. An analysis of the SG of the various material types was conducted to determine the average SG of the mineralized zones and enclosing unmineralized rocks. The

wireframe models of the Sulphide, Disseminated, and Hangingwall Zones were used to code the database and extract those SG measurements that were contained within the respective wireframe models. Similarly, the SG measurements for the unmineralized wall rocks were also extracted and the SG values of the different rock types were determined.

A total of 2,017 SG values were extracted for analysis and the average SG of the various material types are presented in Table 14-6. RPA used the average SG for each of these material types to code the appropriate codes in the block model. The SG values of all blocks above the topographic surface were assigned a value of zero, as were all blocks that were located above the digital model of the Falconbridge open pit mine.

The SG values of a small number of samples of the overburden materials were determined during the course of a geotechnical testing program.

**TABLE 14-6 SUMMARY OF THE AVERAGE BULK DENSITIES FOR THE MINERALIZED AND UNMINERALIZED MATERIALS, MAKWA DEPOSIT  
Mustang Minerals Corp. – Makwa-Mayville Project**

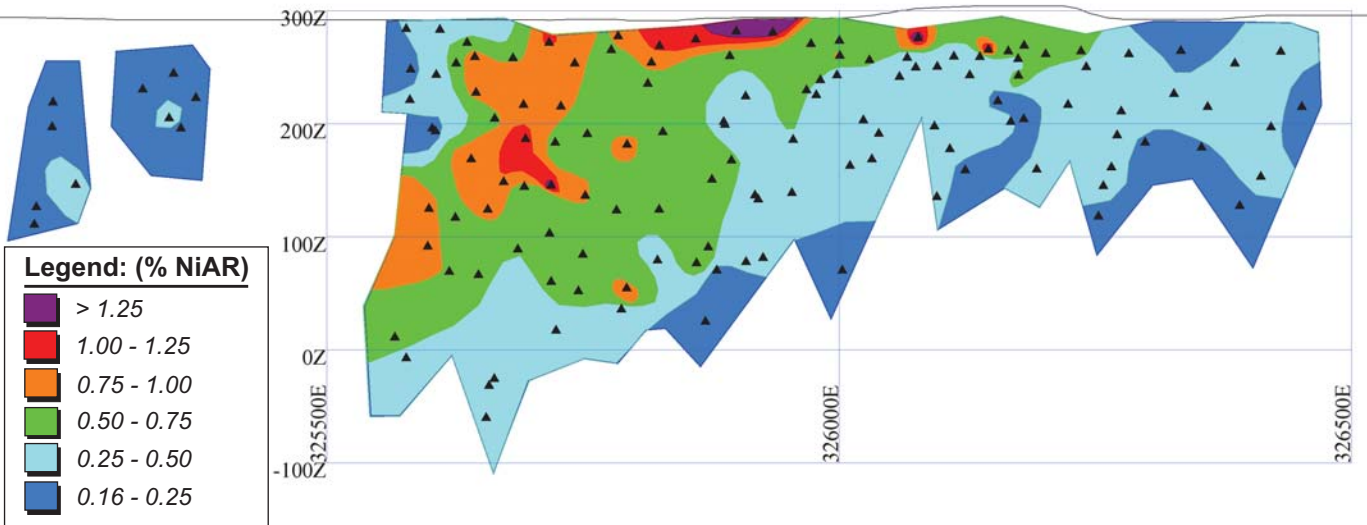
Unit	Average Density	No. Samples
<b>Unmineralized:</b>		
Anorthosite Gabbro	2.79	12
Main Peridotite	2.82	749
Footwall Mafic	2.97	696
Overburden (wet density)	1.84	4
<b>Mineralized:</b>		
Sulphide Zone	2.94	190
Disseminated Zone	2.88	301
Hangingwall Zone	2.78	69
<b>Total</b>	<b>2.86</b>	<b>2,017</b>

### TREND ANALYSIS

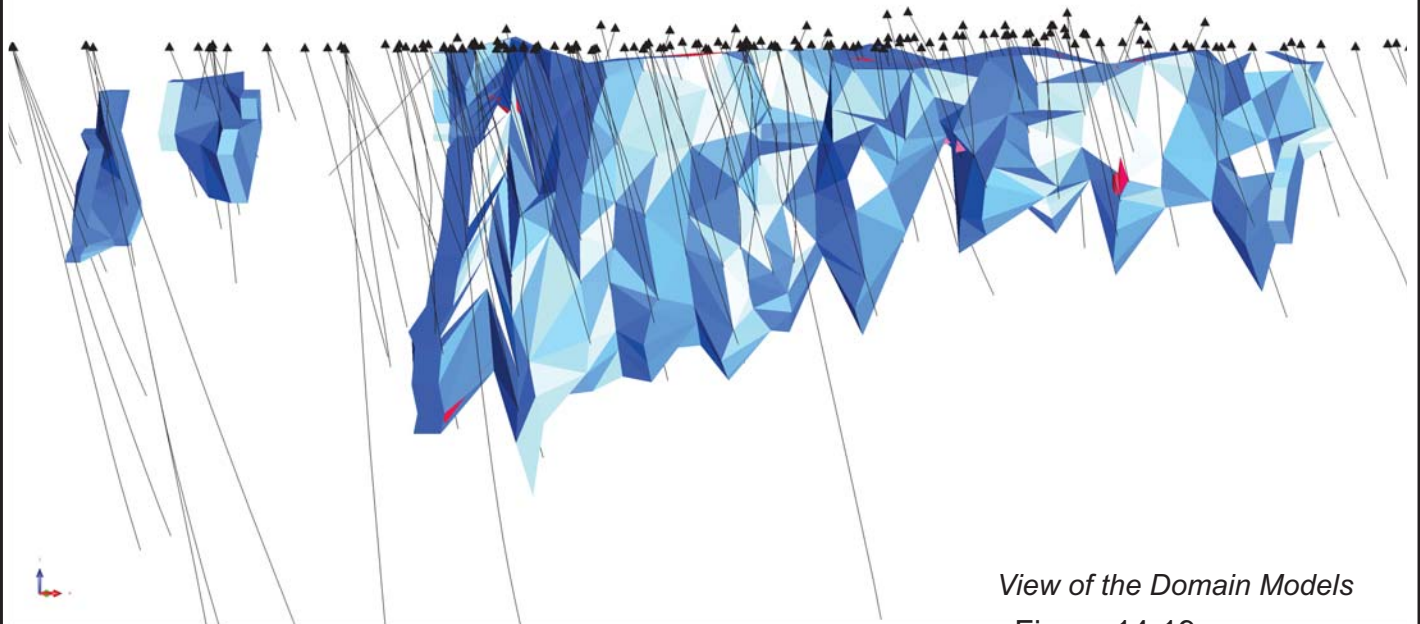
As an aid to development of a variography study of the continuity of the nickel and copper grades at Makwa, RPA conducted a short study of the overall trends that may be present. For this exercise, a data file was prepared that contained the average nickel and copper grade for each drill hole that pierced the combined Sulphide and Disseminated domain model, and was used to create a weighted average zone composite of the nickel and copper grades for each zone. The resulting nickel and copper grades were contoured on a longitudinal projection and the results are shown in Figures 14-19 and 14-20, respectively.

Southwest (Az. 245°)

Northeast (Az. 065°)



Contoured Nickel (AR) Grades  
Sulphide + Disseminated Zones, Makwa Project  
(Looking Northwest (Azimuth 335°))



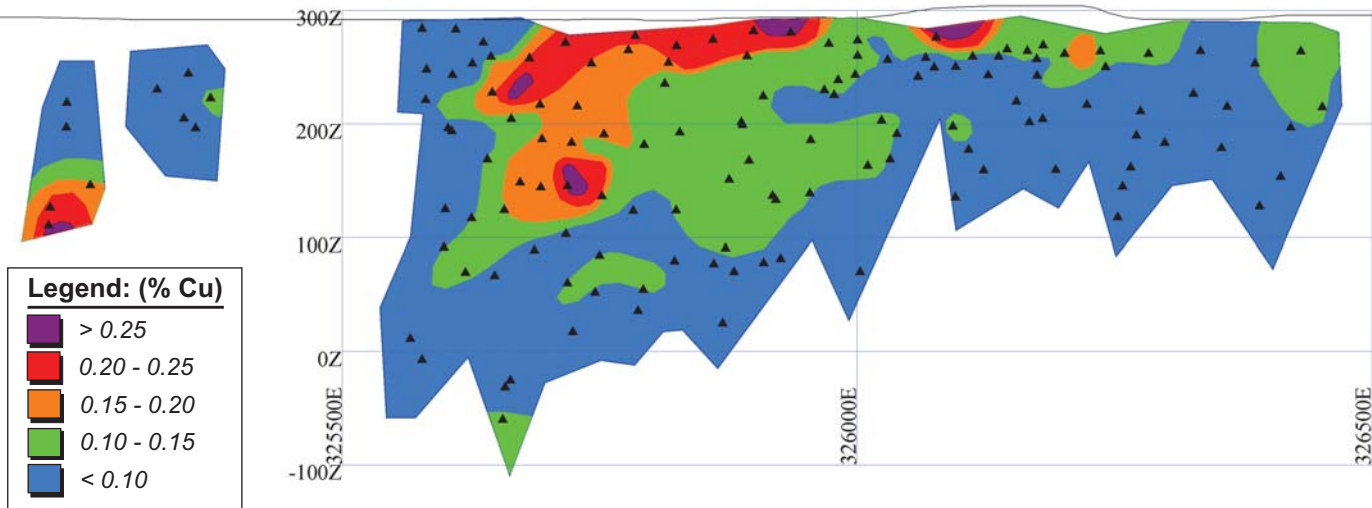
View of the Domain Models  
Figure 14-19

**Mustang Minerals Corporation**  
**Mayville-Makwa Project**  
**Makwa Deposit**  
Southern Manitoba, Canada  
**Longitudinal Projection Showing  
the Distribution of Nickel Grades**

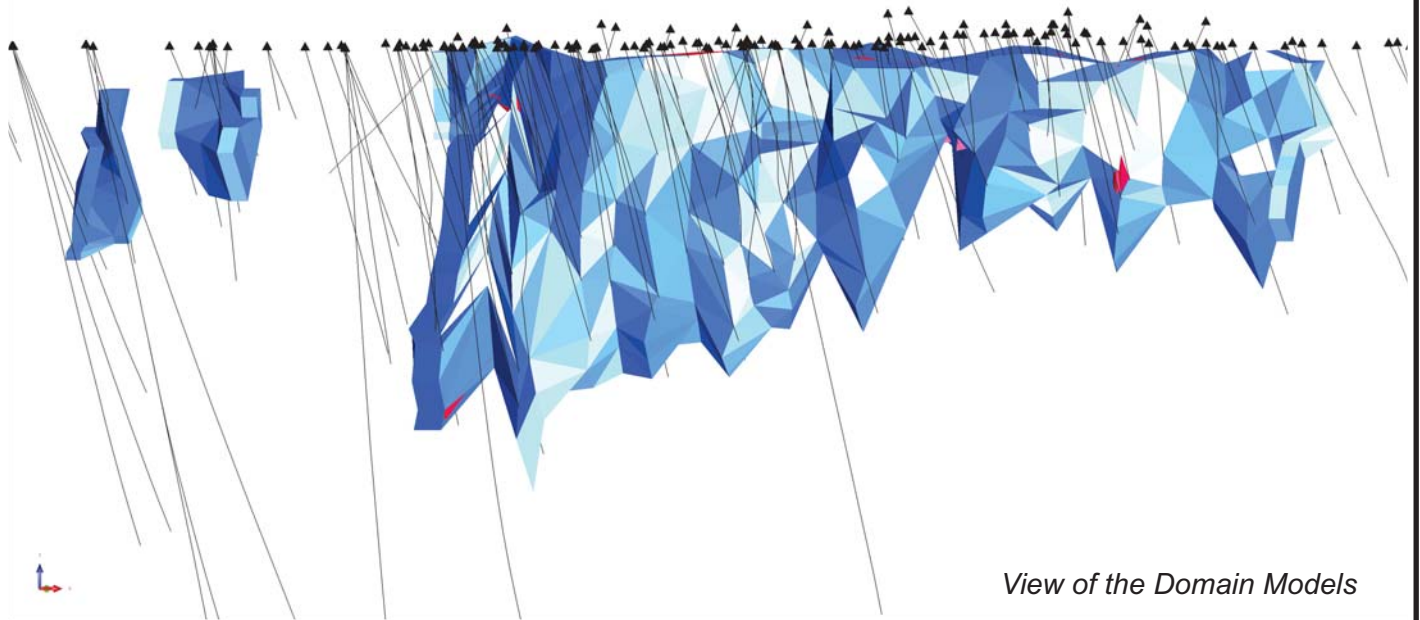


Southwest (Az. 245°)

Northeast (Az. 065°)



Contoured Copper Grades  
Sulphide + Disseminated Zones, Makwa Project  
(Looking Northwest (Azimuth 335°))



View of the Domain Models

Figure 14-20

**Mustang Minerals Corporation**  
**Mayville-Makwa Project**  
**Makwa Deposit**  
 Southern Manitoba, Canada  
**Longitudinal Projection Showing**  
**the Distribution of Copper Grades**

## VARIOGRAPHY

The analysis of the variographic parameters of the mineralization found in the three mineralized domains began with the construction of downhole and omni-directional variograms using the capped, 2.5 m composited sample data with the objective of determining the global nugget (C0) for the nickel data set. An evaluation of any anisotropies that may be present in the data resulted in successful variograms for the three principal directions with model fits ranging from reasonable to good for the Sulphide and Disseminated zones. A greater degree of difficulty was experienced in achieving good variogram model fits for the Hangingwall Zone, and it is believed that this is related to the segmented and discontinuous nature of the solid model for this zone. It is important to note that the segmentation observed in the solid model for the Hangingwall Zone is due to a combination of various factors including discontinuous assay coverage, drill hole spacing, (possible) faulting, and true discontinuity of the mineralization. A summary of the results of this variography analysis is presented in Table 14-7.

**TABLE 14-7 SUMMARY OF VARIOGRAPHIC PARAMETERS WITHIN THE  
SULPHIDE, DISSEMINATED AND HANGINGWALL DOMAIN MODELS, MAKWA  
DEPOSIT  
Mustang Minerals Corp. – Makwa-Mayville Project**

Item	Nickel (D2)	Copper (D4)	Palladium (D6)	Platinum (D8)	Cobalt (D10)
	<b>Sulphide Zone (Code 402):</b>				
Variogram Type	Spherical	Spherical	Spherical	Spherical	Spherical
<b><u>NUGGET:</u></b>					
Nugget (Downhole)	0.060	0.005	0.068	0.011	0.000008
Sill (C1-Downhole)	0.118	0.007	0.195	0.023	0.00001
Range (m)	17.5	27.9	34.7	54.5	8
Nugget (OmniDirectional)	<b>0.027</b>	<b>0.004</b>	<b>0.034</b>	<b>0.005</b>	<b>0.000023</b>
Sill (C1- OmniDirectional)	<b>0.195</b>	<b>0.009</b>	<b>0.254</b>	<b>0.021</b>	<b>0.0016</b>
Range (m)	<b>17.8</b>	<b>17.6</b>	<b>49.0</b>	<b>44.3</b>	<b>37</b>
<b><u>ANISOTROPIES:</u></b>					
<b><u>Major Axis:</u></b>					
Orientation	-70° → 140°	-70° → 140°	-70° → 140°	-70° → 140°	-70° → 140°
Angular Tolerance	30°	45°	60°	60°	45°
Sill (C1)	0.177	0.011	0.272	0.023	0.00024
Range (m)	70	63	63	57	90
<b><u>Semi Major Axis:</u></b>					
Orientation	0° → 230°	0° → 230°	0° → 230°	0° → 230°	0° → 230°
Angular Tolerance	30°	30°	45°	45°	45°
Sill (C1)	0.216	0.009	0.225	0.018	0.00023
Range (m)	30	65	41	39	101

Item	Nickel (D2)	Copper (D4)	Palladium (D6)	Platinum (D8)	Cobalt (D10)
<b>Minor Axis:</b>					
Orientation	+20° → 140°	+20° → 010°	+20° → 140°	+20° → 140°	+20° → 140°
Angular Tolerance	45°	45°	45°	45°	45°
Sill (C1)	0.173	0.013	0.075	0.008	0.0001
Range (m)	11	18	14	9	9
<b>SEARCH ELLIPSE:</b>					
Major Axis (Pass 2, Short Range)	70m@140°(-70°)	65m@140°(-70°)	65m@140°(-70°)	60m@140°(-70°)	100m@230°(0°)
Semi-Major Axis	30m@230°(0°)	65m@230°(0°)	40m@230°(0°)	40m@230°(0°)	90m@140°(-70°)
Minor Axis	10m@140°(+20°)	20m@140°(+20°)	15m@140°(+20°)	10m@140°(+20°)	10m@140°(+20°)
Major/Semi-Major Ratio	2.3	1	1.6	1.5	1.1
Major/Minor Ratio	7	3.25	4.3	6	10
Number of Points					
Range for Pass 1 (Long Range)					
Minimum Number of Points	2	2	2	2	2
Maximum Number of Points	8	8	8	8	8
Search Ellipse Type	Quadrant	Quadrant	Quadrant	Quadrant	Quadrant
<b>Disseminated Zone (Code 407):</b>					
Variogram Type	Spherical	Spherical	Spherical	Spherical	Spherical
<b>NUGGET:</b>					
Nugget (Downhole)	0.011	0.002	0.010	0.0006	0.00001
Sill (C1-Downhole)	0.018	0.003	0.021	0.0019	0.00002
Range (m)	25	19	27	29	19
Nugget (OmniDirectional)	<b>0.010</b>	<b>0.002</b>	<b>0.004</b>	<b>0.0004</b>	<b>0.000011</b>
Sill (C1-OmniDirectional)	<b>0.021</b>	<b>0.002</b>	<b>0.032</b>	<b>0.0024</b>	<b>0.00005</b>
Range (m)	<b>29</b>	<b>24</b>	<b>23</b>	<b>24</b>	<b>39</b>
<b>ANISOTROPIES:</b>					
<b>Major Axis:</b>					
Orientation	-70° → 140°	-70° → 230°	-70° → 140°	-70° → 140°	-70° → 140°
Angular Tolerance	30°	45°	45°	45°	45°
Sill (C1)	0.022	0.002	0.038	0.003	0.000047
Range (m)	51	49	42	44	44
<b>Semi Major Axis:</b>					
Orientation	0° → 230°	0° → 230°	0° → 230°	0° → 230°	0° → 230°
Angular Tolerance	45°	45°	45°	60°	45°
Sill (C1)	0.021	0.002	0.034	0.003	0.000056
Range (m)	53	32	23	32	38
<b>Minor Axis:</b>					
Orientation	+20° → 140°	+20° → 140°	+20° → 140°	+20° → 140°	+20° → 140°
Angular Tolerance	45°	45°	45°	45°	45°
Sill (C1)	0.022	0.002	0.038	0.003	0.000051
Range (m)	17	19	28	27	39

Item	Nickel (D2)	Copper (D4)	Palladium (D6)	Platinum (D8)	Cobalt (D10)
<b><u>SEARCH ELLIPSE:</u></b>					
Major Axis (Pass 2, Short Range)	55m@230°(0°)	50m@140°(-70°)	40m@140°(-70°)	45m@140°(-70°)	45m@140°(-70°)
Semi-Major Axis	50m@140°(-70°)	30m@230°(0°)	25m@230°(0°)	30m@230°(0°)	40m@230°(0°)
Minor Axis	15m@140°(+20°)	20m@140°(+20°)	25m@140°(+20°)	30m@140°(+20°)	40m@140°(+20°)
Major/Semi-Major Ratio	1.1	1.7	1.6	1.5	1.1
Major/Minor Ratio	3.7	2.5	1.61	1.51	1.11
Number of Points					
Range for Pass 1 (Long Range)					
Minimum Number of Points	2	2	2	2	2
Maximum Number of Points	8	8	8	8	8
Search Ellipse Type	Quadrant	Quadrant	Quadrant	Quadrant	Quadrant
<b>Hangingwall Zone (Code 403):</b>					
Variogram Type	Spherical	Spherical	Spherical	Spherical	Spherical
<b><u>NUGGET:</u></b>					
Nugget (Downhole)	<b>0.001</b>	0.001	0.002	0.0001	0.000014
Sill (C1-Downhole)	<b>0.004</b>	0.001	0.004	0.0004	0.000008
Range (m)	<b>10</b>	14	9	8	16
Nugget (OmniDirectional)	0.002	<b>0.001</b>	<b>0.0006</b>	<b>0.0001</b>	<b>0.000013</b>
Sill (C1-OmniDirectional)	0.004	<b>0.002</b>	<b>0.006</b>	<b>0.0006</b>	<b>0.000013</b>
Range (m)	15	<b>29</b>	<b>10</b>	<b>12</b>	<b>33</b>
<b><u>ANISOTROPIES:</u></b>					
<b><u>Major Axis:</u></b>					
Orientation	-70° → 140°	-70° → 140°	-70° → 140°	-70° → 140°	-70° → 140°
Angular Tolerance	30°	45°	60°	45°	45°
Sill (C1)	0.007	0.003	0.007	0.0008	0.000025
Range (m)	30	35	12	13	92
<b><u>Semi Major Axis:</u></b>					
Orientation	0° → 230°	0° → 230°	0° → 230°	0° → 230°	0° → 230°
Angular Tolerance	60°	60°	60°	45°	45°
Sill (C1)	0.005	0.002	0.007	0.0008	0.000015
Range (m)	16	70	18	19	113
<b><u>Minor Axis:</u></b>					
Orientation	+20° → 140°	+20° → 140°	+20° → 140°	+20° → 140°	+20° → 140°
Angular Tolerance	45°	45°	30°	45°	30°
Sill (C1)	0.004	0.002	0.001	0.0004	0.000012
Range (m)	8	26	11	11	7
<b><u>SEARCH ELLIPSE:</u></b>					
Major Axis (Pass 2, Short Range)	30m@140°(-70°)	35m@140°(-70°)	20m@230°(0°)	20m@230°(0°)	115m@230°(0°)
Semi-Major Axis	20m@230°(0°)	35m@230°(0°)	12m@140°(-70°)	15m@140°(-70°)	90m@140°(-70°)
Minor Axis	10m@140°(+20°)	25m@140°(+20°)	10m@140°(+20°)	10m@140°(+20°)	10m@140°(+20°)
Major/Semi-Major	1.5	1	1.7	1.3	1.3

Item	Nickel (D2)	Copper (D4)	Palladium (D6)	Platinum (D8)	Cobalt (D10)
Ratio					
Major/Minor Ratio	3	1.4	2	2	11.5
Number of Points					
Range for Pass 1 (Long Range)					
Minimum Number of Points	2	2	2	2	2
Maximum Number of Points	8	8	8	8	8
Search Ellipse Type	Quadrant	Quadrant	Quadrant	Quadrant	Quadrant

### BLOCK MODEL CONSTRUCTION

An upright, rotated, whole block model (i.e., blocks receive information such as lithological assignments and estimated metal grades on the basis of whether the block centroid is contained entirely within the volume under consideration) with the long axis of the blocks oriented along an azimuth 070° (i.e., parallel to the trend of the mineralization) was constructed using the Gemcom-Surpac v6.1.1 software package and the parameters presented in Table 14-8. A number of attributes were also created to store such information as metal grades by the various interpolation methods, distances to, and number of, informing samples, domain codes, and resource classification codes. A summary of these attributes is presented in Table 14-9.

Given the advanced stage of the Makwa deposit, sufficient information relating to the most appropriate open pit mining rate(s) and equipment selection is available to guide in the selection of block dimensions. In consideration of the envisioned mining rate and related mining fleet, block dimensions that measured ten metres along strike, five metres across strike, and five metres in height were considered appropriate.

**TABLE 14-8 MAKWA BLOCK MODEL PARAMETERS**  
Mustang Minerals Corp. – Makwa-Mayville Project

Type	Y (across-dip)	X (along strike)	Z (down-dip)
Minimum Coordinates	5,592,300	324,800	-300
Maximum Coordinates	5,593,400	326,800	400
User Block Size	5	10	5
Min. Block Size	5	10	5
Rotation	-20.000	0.000	0.000

**TABLE 14-9 MAKWA BLOCK MODEL ATTRIBUTES**  
**Mustang Minerals Corp. – Makwa-Mayville Project**

Attribute Name	Type	Decimals	Default Value	Description
co_cap_id2	Real	2	0	Cobalt capped by Inverse Distance, Power 2
co_cap_nn	Real	2	0	Cobalt capped by Nearest Neighbour
co_cap_ok	Real	2	0	Cobalt capped by Ordinary Kriging
cu_cap_id2	Real	2	0	Copper capped by Inverse Distance, Power 2
cu_cap_nn	Real	2	0	Copper capped by Nearest Neighbour
cu_cap_ok	Real	2	0	Copper capped by Ordinary Kriging
density	Real	2	2.86	Gabbro=2.79, Main Peridotite=2.82, FW Mafic=2.97, Massive Zone=2.94, Disseminated Zone=2.88, HW Zone=2.78
kvar_co	Real	1	0	Kriging variance, Cobalt
kvar_cu	Real	1	0	Kriging variance, Copper
kvar_ni	Real	1	0	Kriging variance, Nickel
kvar_pd	Real	1	0	Kriging variance, Palladium
kvar_pt	Real	1	0	Kriging variance, Platinum
litho	Integer	-	0	Ovb=102, Gabbro=110, Peridotite=114, FW Mafic=104, FW UM Intrusive=113
min_zone	Integer	-	0	Massive Zone=402, Disseminated Zone=407, HW Zone=403
ni_avg_dist	Real	1	0	Average Distance of Informing Samples, Nickel
ni_cap_id2	Real	2	0	Nickel capped by Inverse Distance, Power 2
ni_cap_nn	Real	2	0	Nickel capped by Nearest Neighbour
ni_cap_ok	Real	2	0	Nickel capped by Ordinary Kriging
ni_nearest	Real	1	0	Distance to Nearest Informing Sample, Nickel
no_sample_ni	Integer	-	0	Number of Informing Samples, Nickel
pass_no	Integer	-	0	Long Range=1, Short Range=2
pd_cap_id2	Real	2	0	Palladium capped by Inverse Distance, Power 2
pd_cap_nn	Real	2	0	Palladium capped by Nearest Neighbour
pd_cap_ok	Real	2	0	Palladium capped by Ordinary Kriging
pt_cap_id2	Real	2	0	Platinum capped by Inverse Distance, Power 2
pt_cap_nn	Real	2	0	Platinum capped by Nearest Neighbour
pt_cap_ok	Real	2	0	Platinum capped by Ordinary Kriging

Nickel, copper, palladium, platinum, and cobalt grades were interpolated into the individual blocks for each of the mineralized domains using the Ordinary Kriging, Inverse Distance to the power 2, and Nearest Neighbour interpolation methods. A two-pass approach was used wherein the information from the variography analysis described above was used to establish the parameters of the search ellipse for the short range pass. The size of the search ellipse was increased for the long-range pass in order to achieve a filling of all blocks within the nickel domain model. Details regarding the search ellipse parameters have been presented in Table 14-7 above.

“Hard” domain boundaries were used along the contacts of the mineralized domain models in which only data contained within the separate domain models were allowed to be used to estimate the grades of the blocks, and only those blocks within the domain limits were allowed to receive grade estimates. The capped, composited grades of all the drill hole intersections for the respective domains were used to derive an estimate of a block’s grade for those locations situated between drill hole pierce points. In this manner, lower grade or barren assay results that occur within the domain boundary were allowed to influence the estimated block grades and act as internal dilution.

### **BLOCK MODEL VALIDATION**

Validation efforts for the Mineral Resource estimate at the Makwa deposit consisted of a comparison of the average block grades for the capped metal values against the respective informing composite samples. As well, the volumes reported from the block model were compared to the volumes of the solid model of the three mineralized domain models. The reconciliation report is presented in Table 14-10. It can be seen that there is a good correlation for the average block grades estimated using the three interpolation methods, and between the average estimated block grades and the informing composite samples. As well, there is a good fit between the reported volumes for the mineralized domain model and the block model.

**TABLE 14-10 COMPARISON OF BLOCK MODEL REPORTS TO CAPPED COMPOSITE SAMPLES AND GEOLOGICAL DOMAIN MODELS, MAKWA DEPOSIT  
Mustang Minerals Corp. – Makwa-Mayville Project**

Tonnes (000)	Volume (000)	Nickel (%)			Copper (%)			Palladium (g/t)			Platinum (g/t)			Cobalt (%)		
		ID <sup>2</sup>	OK	NN	ID <sup>2</sup>	Ok	NN	ID <sup>2</sup>	Ok	NN	ID <sup>2</sup>	OK	NN	ID <sup>2</sup>	OK	NN
<b>Sulphide Zone (402):</b>																
2,972	1,132	1.06	1.05	1.06	0.18	0.18	0.18	0.69	0.67	0.68	0.18	0.18	0.18	0.02	0.02	0.02
Composite Averages		1.03	1.03	1.03	0.18	0.18	0.18	0.62	0.62	0.62	0.16	0.16	0.16	0.02	0.02	0.02
Solid Model	1,137	Difference (BM-Solid): -4,288 m <sup>3</sup> x 2.94 = -12,600 tonnes (-0.4%)														
<b>Disseminated Zone (407):</b>																
11,975	4,255	0.32	0.32	0.32	0.08	0.08	0.08	0.22	0.22	0.22	0.06	0.06	0.06	0.01	0.01	0.01
Composite Averages		0.31	0.31	0.31	0.08	0.08	0.08	0.21	0.21	0.21	0.06	0.06	0.06	0.01	0.01	0.01
Solid Model	4,228	Difference (BM-Solid): +27,719 m <sup>3</sup> x 2.88 = +79,800 tonnes (+0.7%)														
<b>Hangingwall Zone (403):</b>																
8,887	3,200	0.20	0.20	0.20	0.04	0.04	0.04	0.07	0.07	0.07	0.02	0.02	0.02	0.01	0.01	0.01
Composite Averages		0.20	0.20	0.20	0.04	0.04	0.04	0.09	0.09	0.09	0.03	0.03	0.03	0.01	0.01	0.01
Solid Model	3,205	Difference (BM-Solid): -4,706 m <sup>3</sup> x 2.78 = -13,100 tonnes (-0.1%)														

\*Note: Sums may not add due to rounding.



## **MINERAL RESOURCE CLASSIFICATION CRITERIA**

The Mineral Resources in this report were estimated in accordance with the CIM definitions. The mineralized material was classified into either the Indicated or Inferred Mineral Resource category on the basis of the search ellipse ranges presented in Table 14-7 above. For the Sulphide and Disseminated zones, those blocks which received interpolated grades that were within the nickel variogram ranges were classified as Indicated Mineral Resources (i.e., those blocks informed with the short-range pass). Due to the poor fits that were obtained for the variogram models and due to the segmented nature of the Hangingwall Zone, all blocks were classified as Inferred Mineral Resources.

## **OPEN PIT OPTIMIZATION**

As described above, the envisioned exploitation scenario for the nickel mineralization contained in the Makwa deposit involves extraction by open pit mining methods and processing the material to produce a nickel-bearing concentrate, using a conventional grinding and flotation process. The concentrates would subsequently be shipped to a domestic smelting/refining complex for final processing into nickel metal and recovery of the other payable metals. An optimized open pit shell was developed by RPA using the Whittle software packages that applied the Lerchs-Grossmann optimization algorithm. The resulting pit shape was used as a reporting criterion in the preparation of the statement of the Mineral Resource estimate for the Makwa deposit. A plan view of the resulting pit shape is presented in Figure 14-21.

14-42

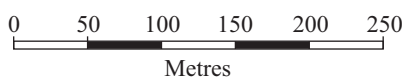
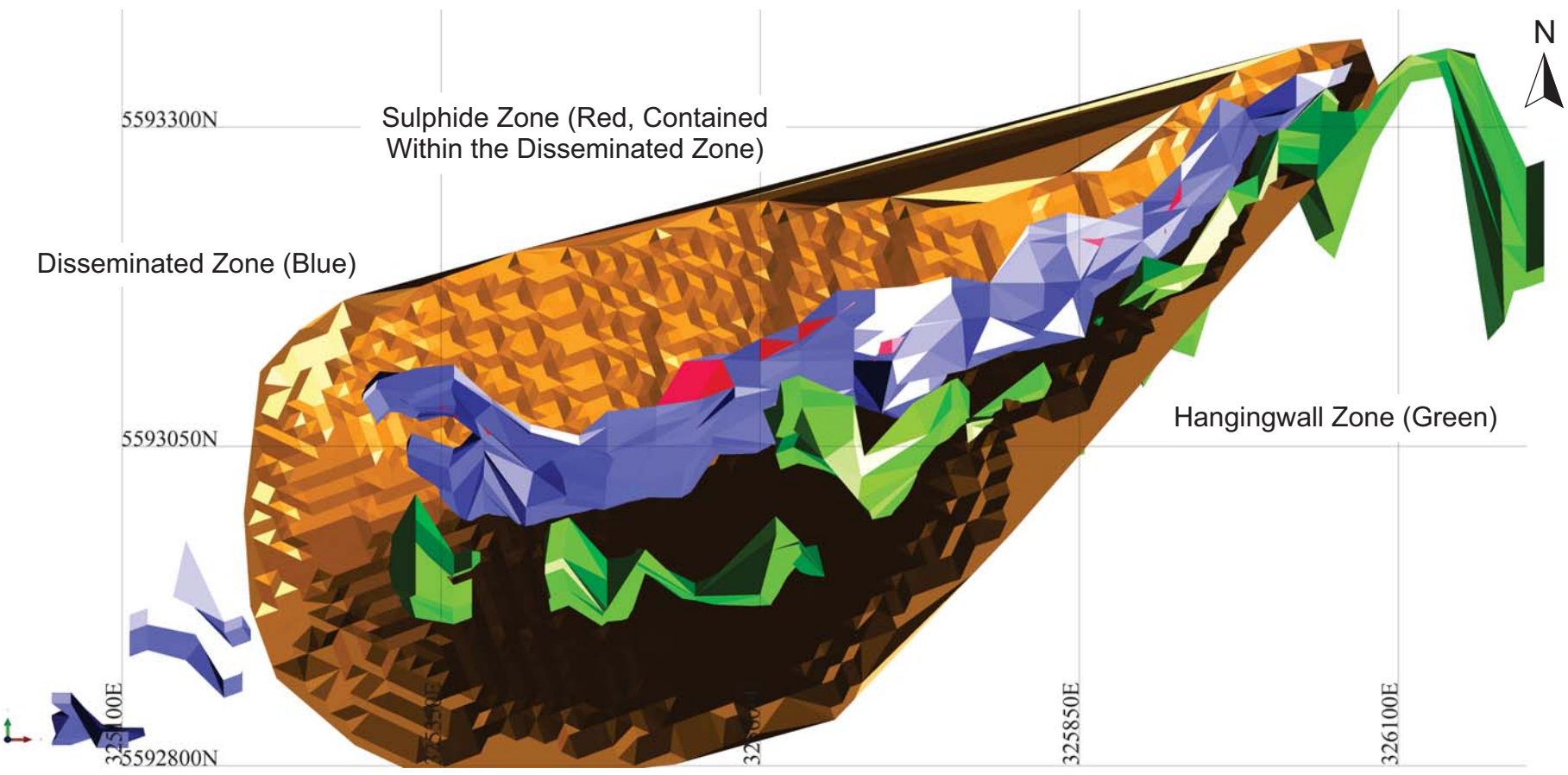


Figure 14-21

**Mustang Minerals Corporation**  
**Mayville-Makwa Project**  
**Makwa Deposit**  
Southern Manitoba, Canada  
**Plan View of the Optimized Open Pit Shell and Mineralized Domains**

## MINERAL RESOURCE ESTIMATE

As a result of the concepts and processes described above, the Mineral Resources for the Makwa nickel-copper-PGM deposit include all blocks that are located within the Sulphide, Disseminated, and Hangingwall domain models, which have an NSR value of greater than \$20.64/tonne (being the sum of the mining, processing, G&A costs presented in Table 14-3) and that are contained within the optimized open pit shell. Ordinary Kriging was used for grade interpolation. The estimated Mineral Resources for the Makwa deposit are set out in Table 14-11.

**TABLE 14-11 ESTIMATED MINERAL RESOURCES FOR THE MAKWA DEPOSIT - OCTOBER 14, 2009**  
**Mustang Minerals Corp. – Makwa-Mayville Project**

Category	Zone	Tonnes	Ni (%)	Cu (%)	Pd (g/t)	Pt (g/t)	Co (%)
Indicated	Sulphide (402)	2,290,000	1.10	0.19	0.65	0.18	0.02
Indicated	Disseminated (407)	4,900,000	0.38	0.10	0.23	0.07	0.01
<b>Total Indicated</b>		<b>7,200,000</b>	<b>0.61</b>	<b>0.13</b>	<b>0.36</b>	<b>0.10</b>	<b>0.01</b>
Inferred	Hangingwall (403)	673,000	0.27	0.08	0.14	0.05	0.02

Notes:

1. CIM definitions have been followed for classification of Mineral Resources.
2. Sums may not add due to rounding.
3. Mineral Resources are reported using a \$20.64 NSR cut-off.
4. The Mineral Resources are estimated using metal prices of US\$3.40/lb Cu and US\$8.50/lb Ni, estimated recoveries and smelter terms, and a US\$/C\$ exchange rate of 0.97.
5. The NSR factors used are: \$87.33 per % Ni, \$29.65 per % Cu, \$38.25 per % Co, \$0.14 per g/t Pt and 0.08 per g/t Pd.

Fluctuation in metal or commodity prices, results of additional drilling, metallurgical testing, receipt of new information and production and the evaluation of mine plans subsequent to the date of any mineral resource estimate may require revision of such an estimate.

RPA has considered the Mineral Resource estimates in light of known environmental, permitting, legal, title, taxation, socio-economic, marketing, political, and other relevant issues and has no reason to believe at this time that the Mineral Resources will be materially affected by these items.

## PREVIOUS RESOURCE ESTIMATES AT MAKWA

All mineral resources reported in this section are provided for informational purposes only and are superseded by the current Mineral Resource estimate contained in Section 14 of this report.

### **RPA 2005 ESTIMATE**

RPA was engaged by Mustang to prepare a mineral resource estimate for the Makwa deposit that incorporated all drilling information available to the end of 2004. RPA's mineral resource estimate did not include cobalt, platinum, and palladium values.

The details of RPA's estimate have been fully disclosed by Evans, 2005, and a summary of the RPA mineral resource estimates, using the categories outlined by the CIM definitions, are presented in Table 14-12.

**TABLE 14-12 SUMMARY OF THE 2005 MINERAL RESOURCE ESTIMATE FOR THE MAKWA PROJECT**  
Mustang Minerals Corp. – Makwa-Mayville Project

Classification	Tonnes	Nickel (%)	Copper (%)	Nickel (lb)	Copper (lb)
<b>Indicated</b>					
Open pit	5,230,000	0.68	0.15	78,750,000	17,060,000
Underground	790,000	1.11	0.14	19,310,000	2,460,000
<b>Total</b>	<b>6,020,000</b>	<b>0.74</b>	<b>0.15</b>	<b>98,060,000</b>	<b>19,520,000</b>
<b>Inferred</b>					
Open pit	320,000	0.54	0.09	3,810,000	650,000
Underground	230,000	1.04	0.14	5,270,000	720,000
<b>Total</b>	<b>550,000</b>	<b>0.75</b>	<b>0.11</b>	<b>9,080,000</b>	<b>1,370,000</b>

Source: Evans, 2005

### **MICON INTERNATIONAL LIMITED 2007 ESTIMATE**

Micon, with input from Met-Chem, completed a preliminary economic assessment for the Makwa deposit on January 23, 2007 in order to determine the economic feasibility of bringing the Makwa Project into production. Micon utilized the grade-block model prepared by RPA. The details pertaining to the construction of the RPA grade-block model were examined, as well as the input parameters utilized to arrive at an outline of a potentially economic open pit shell. Micon believed that the historical estimate was relevant to the purposes of RPA's scope of work at the time and that the estimate could be relied upon as a basis for further work.

Micon used the Lerchs-Grossmann open pit optimization algorithm contained within the Surpac Vision software package. Micon re-estimated the resource to 8,055,700 t at 0.64% nickel and 0.13% copper in the Indicated category and 992, 500 t at 0.49% nickel and 0.09% copper in the Inferred category (see Table 14-13). This estimate was prepared by Mr. Reno Pressacco, M.Sc. (A), P.Geo.

Micon attributed the changes in the pit shell (i.e., mineralization that can be profitably mined) to its including value from platinum, palladium and cobalt and the utilization of a steeper wall angle that lowered the strip ratio. Note that cobalt, platinum, and palladium values were considered to be in the inferred category only due to the limited available analyses.

**TABLE 14-13 SUMMARY OF THE 2007 MINERAL RESOURCE ESTIMATE FOR THE MAKWA PROJECT**  
**Mustang Minerals Corp. – Makwa-Mayville Project**

	<b>Tonnes t (000)</b>	<b>Nickel (%)</b>	<b>Copper (%)</b>	<b>Cobalt (%)</b>	<b>Platinum (g/t)</b>	<b>Palladium (g/t)</b>
<b>Indicated Resource</b>						
Ni-Cu open pit	8,056	0.64	0.13			
<b>Inferred Resources</b>						
Co-Pt-Pd open pit	8,056			0.02	0.16	0.60
<b>Inferred Resources</b>						
Open pit	993	0.46	0.09	0.02	0.09	0.36
Waste	33,161					

**WARDROP ENGINEERING INC. 2007 ESTIMATE**

In September 2007, Wardrop updated the mineral resource estimate for Makwa. Wardrop developed a block model using available drill hole information to August 1, 2007. The Wardrop Mineral Resource estimate is listed in Table 14-14.

**TABLE 14-14 SUMMARY OF THE MINERAL RESOURCE ESTIMATE FOR THE MAKWA PROPERTY (AS AT SEPTEMBER 1, 2007)  
Mustang Minerals Corp. – Makwa-Mayville Project**

Category	Thousand t	Nickel (%)	Copper (%)	Cobalt (%)	Platinum (g/t)	Palladium (g/t)
Measured	586	0.77	0.17	0.005	0.05	0.16
Indicated	9,534	0.59	0.12	0.016	0.11	0.39
Inferred	832	0.40	0.09	0.017	0.10	0.34

Notes:

1. Mineral Resources, which are not Mineral Reserves do not have demonstrated economic viability. The estimate of Mineral Resources may be materially affected by environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues.
2. The quantity and grade of reported Inferred Resources in this estimation are uncertain in nature and there has been insufficient exploration to define these Inferred Resources as an indicated or measured mineral resource and it is uncertain if further exploration will result in upgrading them to an indicated or measured category.

## MAYVILLE MINERAL RESOURCE ESTIMATE

RPA updated the Mineral Resource for the M2 Deposit using drill hole data available as of November 27, 2013. At an NSR cut-off value of C\$15/t, Indicated Mineral Resources are estimated to total 26.6 million tonnes of 0.44% Cu, 0.18% Ni, 0.05 g/t Au, 0.05 g/t Pt, and 0.14 g/t Pd. At the same cut-off, Inferred Mineral Resources are estimated to total 5.2 million tonnes of 0.48% Cu, 0.19% Ni, 0.04 g/t Au, 0.06 g/t Pt, and 0.15 g/t Pd.

This Mineral Resource estimate is based on work done in early 2013, and reported in Ross, 2013. For the current report, RPA has updated the NSR factors, preliminary pit shell, and cut-off NSR value. Most sections reported below were copied verbatim from Ross, 2013.

## RESOURCE DATABASE

Mustang maintains the drill hole data in a customized GeolInfo Tools Database. RPA received the Mayville drill data in Excel format, and subsequently exported, compiled and parsed the data as required, and imported it into Gemcom GEMS (GEMS) software for modelling and evaluation.

Listed below is a summary of records directly related to the resource estimate. Holes outside the resource area are not included in this summary:

- Holes: 103
- Surveys: 443
- Assays: 7,610
- Lithology: 1,134
- Composites: 1,814
- Density measurements: 1,454

The most recent hole used in the resource database was MAY12-60. As noted above in Section 10, Drilling, Mustang drilled an additional 17 holes totalling 3,262 m on the Mayville property since the resource estimate by RPA dated December 31, 2012. Several holes were drilled in or near the resource area. RPA reviewed these holes in section and level plan and confirmed that they would have only a minor impact on the local grade estimate and that overall the previous block model is still valid and current.

Section 12, Data Verification, describes the verification steps made by RPA. In summary, no discrepancies were identified and RPA is of the opinion that the Gemcom drill hole database is valid and suitable to estimate Mineral Resources for the Project.

## **GEOLOGICAL INTERPRETATION AND 3D SOLIDS**

Due to a substantial amount of new drilling and a better understanding of the controls on mineralization, the geological interpretation and three dimensional wireframe models were rebuilt for this resource update. RPA created west-looking vertical sections and level plans spaced 50 m apart, as well as vertical and inclined longitudinal sections parallel to the mineralization. Wireframe models of the mineralized zones were built using 3D wobbly polylines on each cross-section. At model extremities, polylines were extrapolated 25 m or more beyond the last drill hole section or constrained by geology. Polylines were joined together in 3D using tie lines and the continuity was checked using the longitudinal section and level plans.

The wireframes were modelled at a C\$15/t NSR cut-off. Narrow intercepts were “bulked out” to a two metre true thickness where required. Polylines were mostly “snapped” to assay intervals, however, in some cases partial assays were used under the assumption that the mineralized material was more intense and higher grade near the mineralization contact.

The M2 Deposit was modelled as two main zones plus several smaller zones. A description of each zone follows:

- The Main Zone (MZ) is the largest zone, measuring 1,200 m long by up to 600 m deep by 2.3 m to 56 m thick. It outcrops at surface, is intersected by 74 drill holes, and includes some of the highest grade zones in the deposit.
- The Footwall Zone (FZ) is located to the north of the Main Zone and measures 700 m long by 500 m deep by 2.8 m to 95 m thick. It is intersected by 36 drill holes.
- The East Zone (EZ\_A, \_B, \_C) is a series of three stacked sub-zones located east of the Main Zone. It measures 100 m long by 200 m deep by 2.3 m to 20.7 m thick and is intersected by seven drill holes.
- In addition to the above, there are fourteen additional smaller sub-zones located in the immediate hanging wall or footwall of the main mineralized bodies. Most measure approximately 50 m by 50 m by several metres thick.

Intercept grade, true thickness, and grade times thickness (GT) values were plotted in vertical longitudinal sections. Sharp decreases in grade and/or thickness indicated that block grades would be best estimated within “resource panels” using hard boundaries. Using an NSR cut-off value of C\$20/t, resource panels were outlined on the inclined longitudinal section and the wireframe models were clipped where required.

## STATISTICAL ANALYSIS

Assay values located inside the wireframes were tagged with domain identifiers and exported for statistical analysis. Results were used to help verify the modelling process. Basic statistics by zone are summarized in Table 14-15.

**TABLE 14-15 DESCRIPTIVE STATISTICS OF RESOURCE ASSAY VALUES,  
MAYVILLE PROPERTY  
Mustang Minerals Corp. – Makwa-Mayville Property**

	Length (m)	Ni (%)	Cu (%)	Au (ppb)	Pt (ppb)	Pd (ppb)
<b>Main Zone (MZ)</b>						
No. of Cases	1,676	1,676	1,676	1,676	1,676	1,676
Minimum	0.07	0.00	0.00	0	0	0
Maximum	2.74	3.33	20.15	6,690	25,940	15,246
Median	1.52	0.14	0.37	41	34	117
Arithmetic Mean	1.26	0.23	0.57	69	77	175
Standard Deviation	0.40	0.30	0.97	223	654	434
Coefficient of Variation	0.31	1.32	1.69	3.2	8.5	2.5



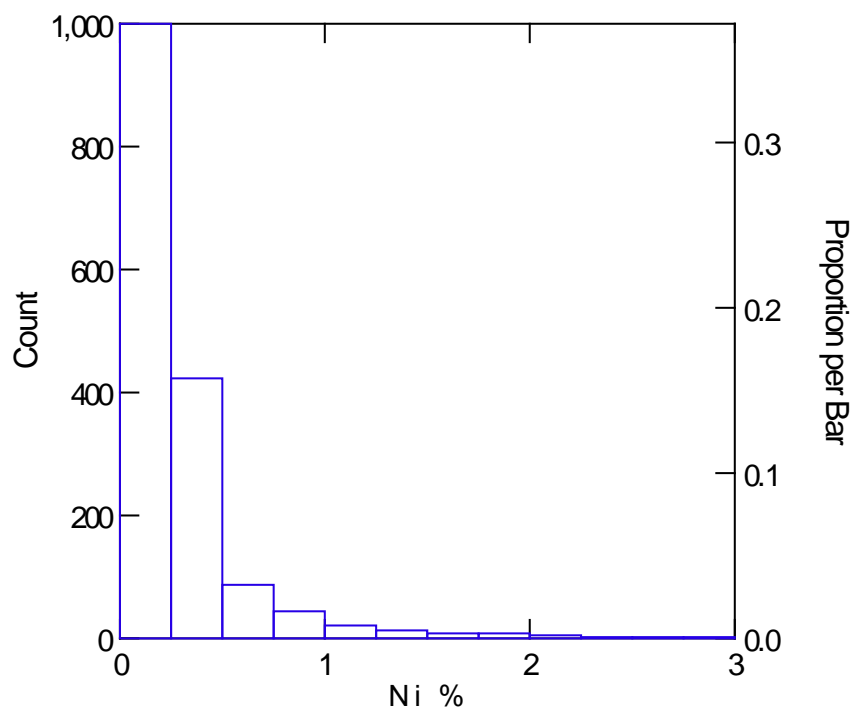
<b>Footwall Zone (FW)</b>						
No. of Cases	835	835	835	835	835	835
Minimum	0.12	0.00	0.00	0	0	0
Maximum	2.44	2.97	6.96	2,420	1,251	1,486
Median	1.50	0.14	0.33	36	42	119
Arithmetic Mean	1.25	0.21	0.45	49	56	149
Standard Deviation	0.37	0.25	0.49	99	72	146
Coefficient of Variation	0.29	1.20	1.09	2.0	1.3	1.0
<b>East Zone A (EZ_A)</b>						
No. of Cases	61	61	61	61	61	61
Minimum	0.12	0.02	0.04	0	0	6.50
Maximum	2.59	2.71	3.26	720	770	1,950
Median	1.50	0.16	0.47	69	40	120
Arithmetic Mean	1.26	0.27	0.70	106	75	215
Standard Deviation	0.54	0.42	0.70	125	116	303
Coefficient of Variation	0.43	1.53	1.00	1.2	1.6	1.4
<b>East Zone B (EZ_B)</b>						
No. of Cases	36	36	36	36	36	36
Minimum	0.18	0.00	0.03	0	0	0
Maximum	2.14	1.45	10.80	1,220	4,370	1,120
Median	1.36	0.25	0.89	84	60	161
Arithmetic Mean	1.22	0.30	1.40	177	220	232
Standard Deviation	0.50	0.26	2.03	306	738	217
Coefficient of Variation	0.41	0.87	1.45	1.7	3.4	0.9
<b>East Zone C (EZ_C)</b>						
No. of Cases	9	9	9	9	9	9
Minimum	0.52	0.15	0.29	65	29	78
Maximum	1.53	0.37	0.87	280	232	370
Median	1.52	0.22	0.46	160	54	140
Arithmetic Mean	1.27	0.22	0.55	163	99	160
Standard Deviation	0.39	0.07	0.24	78	88	87
Coefficient of Variation	0.31	0.33	0.43	0.5	0.9	0.5
<b>Miscellaneous Zones</b>						
No. of Cases	133	133	133	133	133	133
Minimum	0.15	0.01	0.02	0	0	0
Maximum	1.83	1.16	2.60	147	644	1,006
Median	1.40	0.12	0.31	36	37	101
Arithmetic Mean	1.21	0.15	0.41	44	58	135
Standard Deviation	0.38	0.13	0.33	29	82	132
Coefficient of Variation	0.31	0.85	0.80	0.6	1.4	1.0

### CUTTING HIGH-GRADE VALUES

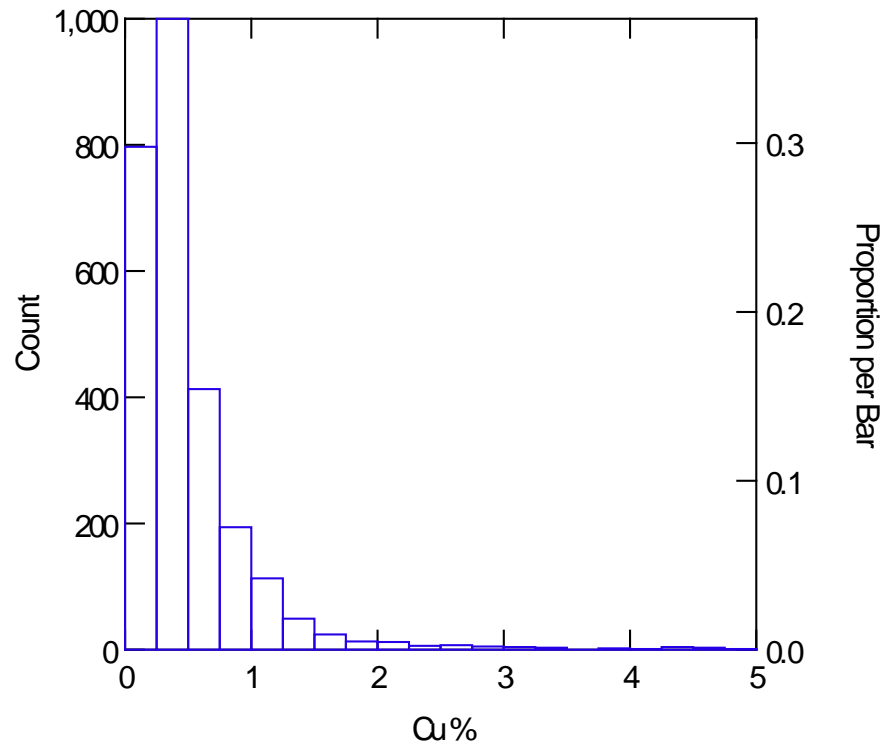
Where the assay distribution is skewed positively or approaches log-normal, erratic high-grade assay values can have a disproportionate effect on the average grade of a deposit. One method of treating these outliers in order to reduce their influence on the average grade is to cut or cap them at a specific grade level. In the absence of production data to calibrate the cutting level, inspection of the assay distribution can be used to estimate a “first pass” cutting level.

Review of the resource assay histograms within the wireframe domains and a visual inspection of high-grade values on vertical sections suggest cutting erratic values to 2.5% Cu, 1.5% Ni, 400 ppb Au, 350 ppb Pt, and 700 ppb Pd. Histograms of resource assays within the wireframe boundaries are shown in Figures 14-22 and 14-23 for nickel and copper. Basic statistics by zone for the capped resource assays are summarized in Table 14-16.

**FIGURE 14-22 HISTOGRAM OF NICKEL RESOURCE ASSAYS, MAYVILLE PROPERTY**



**FIGURE 14-23 HISTOGRAM OF COPPER RESOURCE ASSAYS, MAYVILLE PROPERTY**



**TABLE 14-16 DESCRIPTIVE STATISTICS OF CUT RESOURCE ASSAY VALUES, MAYVILLE PROPERTY**  
Mustang Minerals Corp. – Makwa-Mayville Property

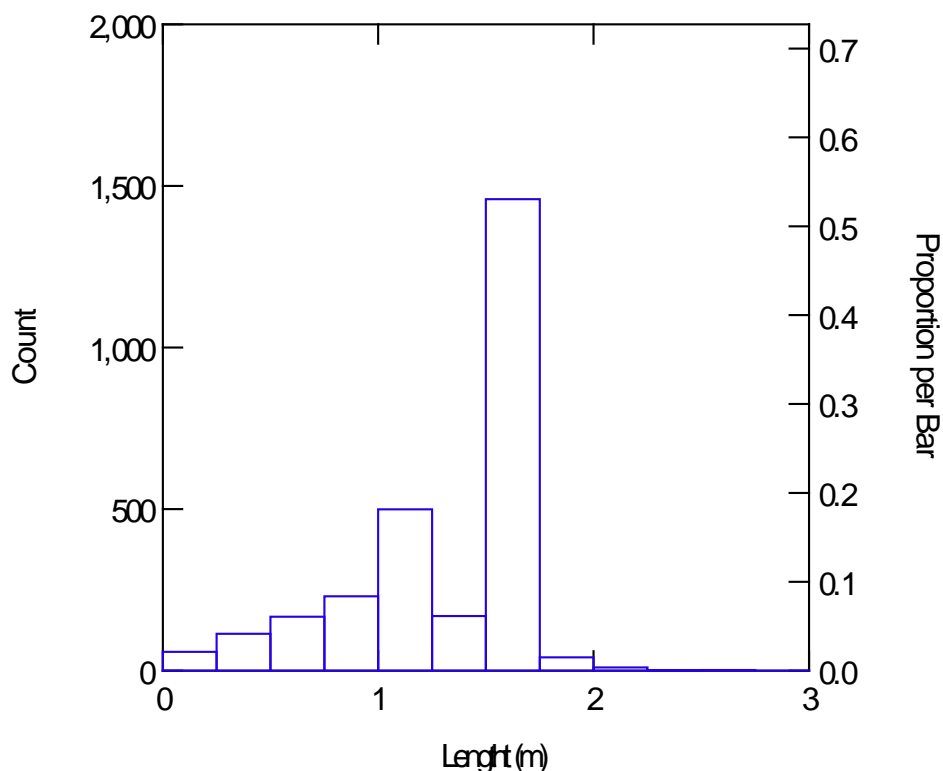
	Ni (%)	Cu (%)	Au (ppb)	Pt (ppb)	Pd (ppb)
<b>Main Zone (MZ)</b>					
No. Cut					
No. of Cases	1,676	1,676	1,676	1,676	1,676
Minimum	0.00	0.00	0	0	0
Maximum	1.50	2.50	400	350	700
Median	0.14	0.37	41	34	117
Arithmetic Mean	0.22	0.51	58	52	155
Standard Deviation	0.25	0.46	61	61	136
Coefficient of Variation	1.14	0.90	1.0	1.2	0.9
<b>Footwall Zone (FW)</b>					
No. Cut					
No. of Cases	835	835	835	835	835
Minimum	0.00	0.00	0	0	0
Maximum	1.50	2.50	400	350	700
Median	0.14	0.33	36	42	119
Arithmetic Mean	0.20	0.43	46	54	144
Standard Deviation	0.22	0.38	43	49	117
Coefficient of Variation	1.07	0.87	0.9	0.9	0.8

	Ni (%)	Cu (%)	Au (ppb)	Pt (ppb)	Pd (ppb)
<b>East Zone A (EZ_A)</b>					
No. Cut					
No. of Cases	61	61	61	61	61
Minimum	0.02	0.04	0	0	7
Maximum	1.50	2.50	400	350	700
Median	0.16	0.47	69	40	120
Arithmetic Mean	0.25	0.67	100	68	183
Standard Deviation	0.30	0.60	100	82	169
Coefficient of Variation	1.21	0.89	1.0	1.2	0.9
<b>East Zone B (EZ_B)</b>					
No. Cut					
No. of Cases	36	36	36	36	36
Minimum	0.00	0.03	0	0	0
Maximum	1.45	2.50	400	350	700
Median	0.25	0.89	84	60	161
Arithmetic Mean	0.30	1.00	113	85	219
Standard Deviation	0.26	0.69	123	82	171
Coefficient of Variation	0.87	0.68	1.1	1.0	0.8
<b>East Zone C (EZ_C)</b>					
No. Cut					
No. of Cases	9	9	9	9	9
Minimum	0.15	0.29	65	29	78
Maximum	0.37	0.87	280	232	370
Median	0.22	0.46	160	54	140
Arithmetic Mean	0.22	0.55	163	99	160
Standard Deviation	0.07	0.24	78	88	87
Coefficient of Variation	0.33	0.43	0.5	0.9	0.5
<b>Miscellaneous</b>					
No. Cut					
No. of Cases	133	133	133	133	133
Minimum	0.01	0.02	0	0	0
Maximum	1.16	2.50	147	350	700
Median	0.12	0.31	36	37	101
Arithmetic Mean	0.15	0.41	44	54	133
Standard Deviation	0.13	0.32	29	61	119
Coefficient of Variation	0.85	0.79	0.6	1.1	0.9

## COMPOSITING

Within the wireframe models, sample lengths range from seven centimetres to 2.74 m, with an average of 1.3 m. Most samples ranged from one metre to 1.5 m lengths (Figure 14-24). Given this distribution, and considering the width of the mineralization and current drill hole spacing, RPA chose to composite to two metre lengths. Basic composite statistics by zone are summarized in Table 14-17.

**FIGURE 14-24 HISTOGRAM OF SAMPLE LENGTHS, MAYVILLE PROPERTY**



**TABLE 14-17 DESCRIPTIVE STATISTICS OF COMPOSITE VALUES, MAYVILLE PROPERTY**

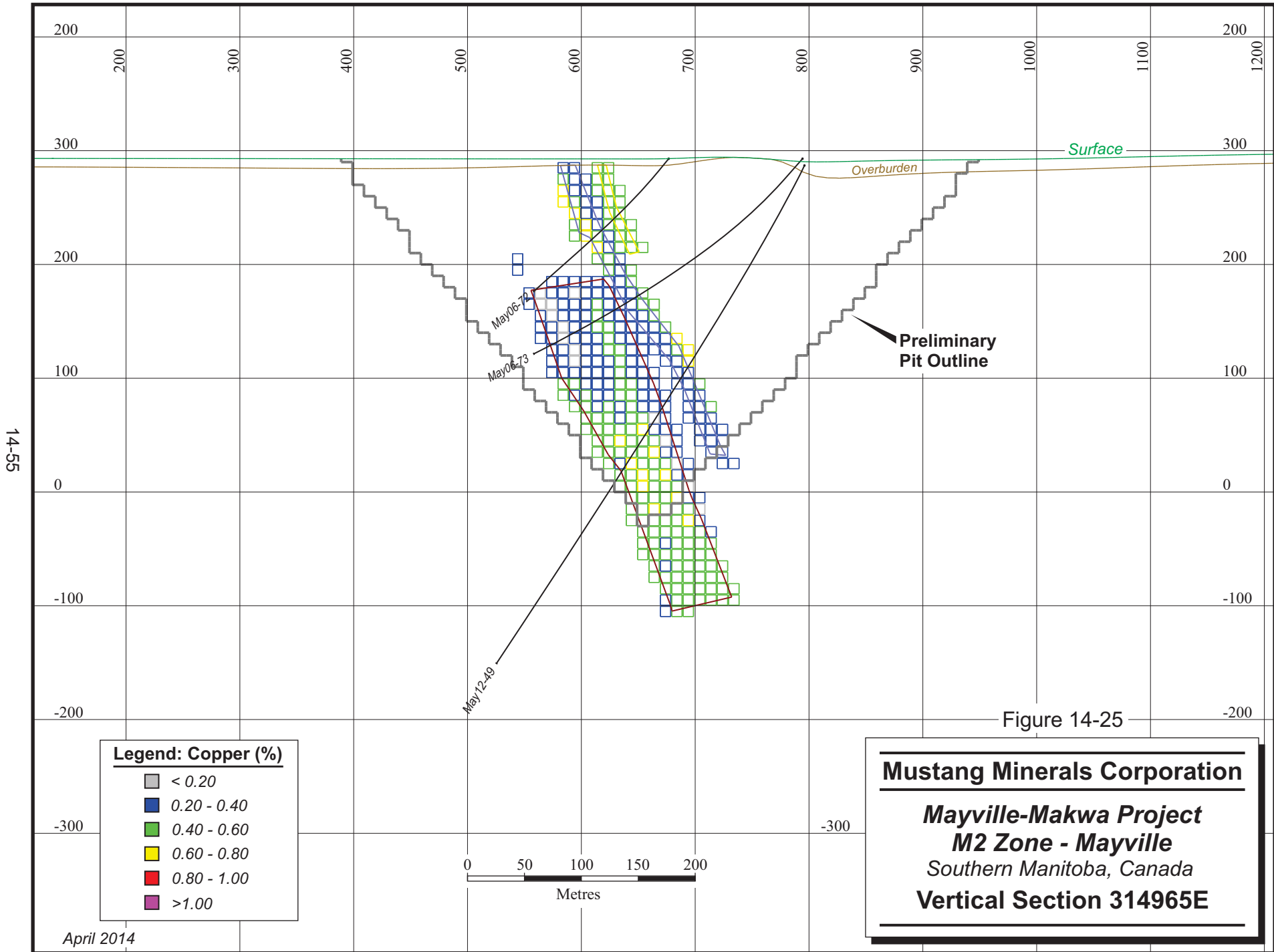
**Mustang Minerals Corp. – Makwa-Mayville Property**

	Ni (%)	Cut Ni (%)	Cu (%)	Cut Cu (%)	Au (ppb)	Cut Au (ppb)	Pt (ppb)	Cut Pt (ppb)	Pd (ppb)	Cut Pd (ppb)
<b>Main Zone (MZ)</b>										
No. of Cases	1,076	1,076	1,076	1,076	1,076	1,076	1,076	1,076	1,076	1,076
Minimum	0.00	0.00	0.00	0.00	0	0	0	0	0	0
Maximum	1.75	1.26	3.97	2.11	1,692	400	19,068	317	3,478	606
Median	0.15	0.15	0.39	0.39	43	43	38	38	122	121
Arithmetic Mean	0.19	0.19	0.49	0.47	61	55	75	49	151	143
Standard Deviation	0.15	0.14	0.38	0.32	98	46	591	44	151	95
Coefficient of Variation	0.78	0.74	0.78	0.68	1.6	0.8	7.9	0.9	1.0	0.7
<b>Footwall Zone (FW)</b>										
No. of Cases	532	532	532	532	532	532	532	532	532	532
Minimum	0.00	0.00	0.00	0.00	3	3	0	0	0	0
Maximum	1.13	0.95	2.57	2.16	1,225	311	695	271	662	478
Median	0.14	0.14	0.33	0.33	37	37	44	44	122	122
Arithmetic Mean	0.18	0.18	0.41	0.41	48	45	54	52	135	134
Standard Deviation	0.13	0.12	0.30	0.28	66	32	49	38	81	75
Coefficient of Variation	0.71	0.69	0.73	0.69	1.4	0.7	0.9	0.7	0.6	0.6

	Ni (%)	Cut Ni (%)	Cu (%)	Cut Cu (%)	Au (ppb)	Cut Au (ppb)	Pt (ppb)	Cut Pt (ppb)	Pd (ppb)	Cut Pd (ppb)
<b>East Zone (EZ_A)</b>										
No. of Cases	42	42	42	42	42	42	42	42	42	42
Minimum	0.03	0.03	0.09	0.09	0	0	3	3	12	12
Maximum	0.54	0.46	1.94	1.60	468	366	770	350	635	466
Median	0.14	0.14	0.50	0.50	69	69	41	41	116	116
Arithmetic Mean	0.18	0.17	0.60	0.58	88	85	71	61	160	151
Standard Deviation	0.13	0.12	0.37	0.33	93	83	123	69	126	105
Coefficient of Variation	0.71	0.66	0.62	0.58	1.1	1.0	1.7	1.1	0.8	0.7
<b>East Zone B (EZ_B)</b>										
No. of Cases	30	30	30	30	30	30	30	30	30	30
Minimum	0.00	0.00	0.00	0.00	0	0	0	0	0	0
Maximum	0.58	0.58	3.42	1.94	1,030	372	2,626	279	377	340
Median	0.17	0.17	0.67	0.67	61	61	49	49	140	140
Arithmetic Mean	0.19	0.19	0.76	0.68	102	75	132	53	150	149
Standard Deviation	0.15	0.15	0.70	0.51	192	88	472	53	111	108
Coefficient of Variation	0.79	0.79	0.93	0.75	1.9	1.2	3.6	1.0	0.7	0.7
<b>East Zone C (EZ_C)</b>										
No. of Cases	7	7	7	7	7	7	7	7	7	7
Minimum	0.16	0.16	0.31	0.31	75	75	29	29	102	102
Maximum	0.30	0.30	0.87	0.87	280	280	180	180	234	234
Median	0.19	0.19	0.50	0.50	181	181	85	85	131	131
Arithmetic Mean	0.21	0.21	0.57	0.57	167	167	90	90	140	140
Standard Deviation	0.05	0.05	0.21	0.21	74	74	58	58	47	47
Coefficient of Variation	0.25	0.25	0.38	0.38	0.4	0.4	0.6	0.6	0.3	0.3
<b>Miscellaneous</b>										
No. of Cases	88	88	88	88	88	88	88	88	88	88
Minimum	0.04	0.04	0.07	0.07	13	13	7	7	18	18
Maximum	0.39	0.39	1.24	1.24	139	139	471	257	423	423
Median	0.12	0.12	0.30	0.30	38	38	36	36	103	103
Arithmetic Mean	0.14	0.14	0.38	0.38	42	42	55	51	127	126
Standard Deviation	0.06	0.06	0.22	0.22	23	23	67	48	86	84
Coefficient of Variation	0.45	0.45	0.60	0.60	0.5	0.5	1.2	0.9	0.7	0.7

## INTERPOLATION PARAMETERS

Grade interpolations for nickel, copper, gold, platinum, and palladium Pt were made using an inverse distance squared (ID<sup>2</sup>) algorithm with a minimum of two and a maximum of twelve composites per block estimate. Hard boundaries were used to limit the use of composites between zones. The first pass search ellipse was 100 m by 100 m by 30 m oriented in the plane of mineralization. A second pass with a search ellipse of 200 m by 200 m by 60 m was used to fill all blocks within the wireframes. Figures 14-25 to 14-29 illustrate the results.



**Legend: Copper (%)**

- < 0.20
- 0.20 - 0.40
- 0.40 - 0.60
- 0.60 - 0.80
- 0.80 - 1.00
- >1.00

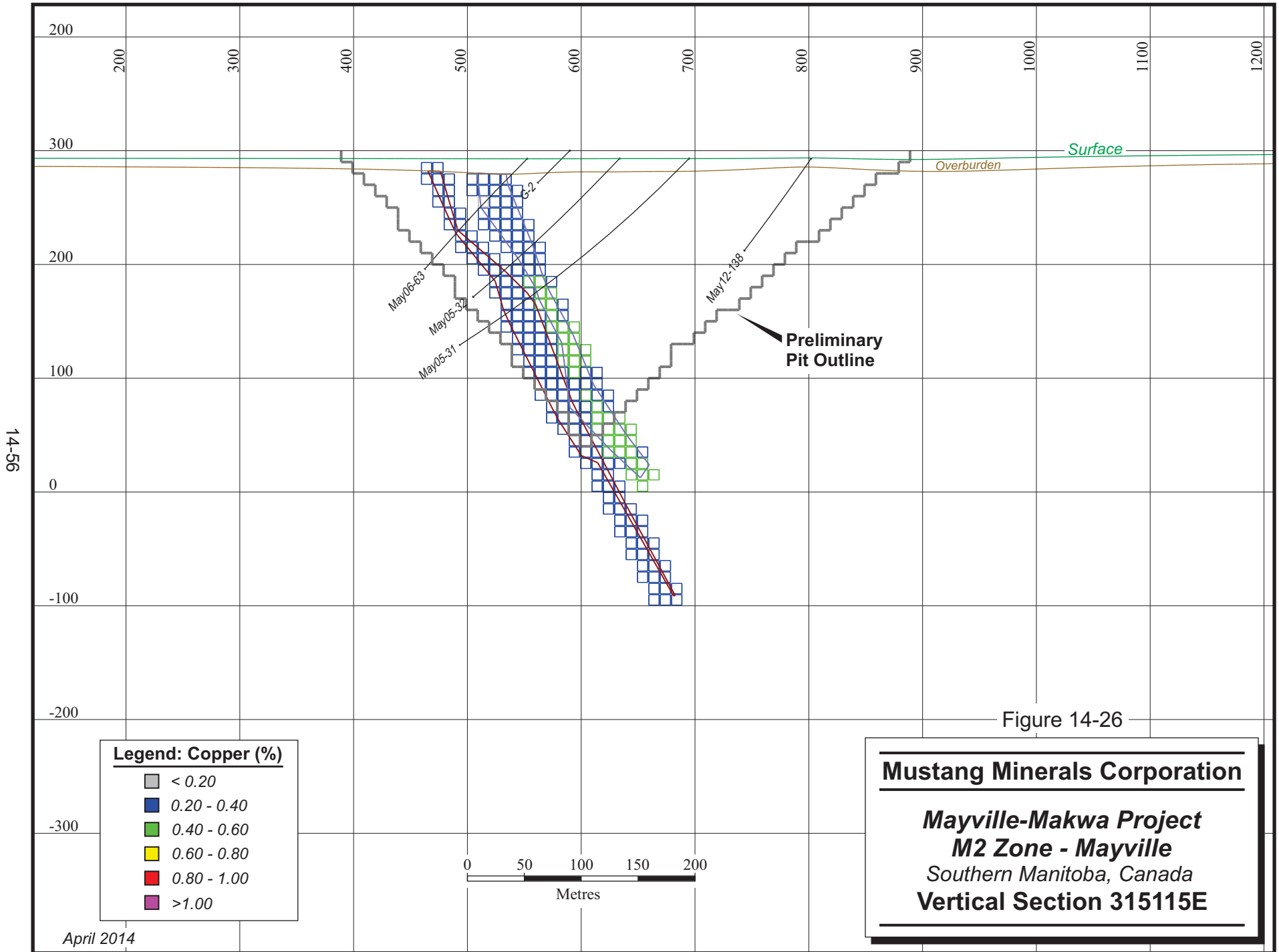
**Mustang Minerals Corporation**

**Mayville-Makwa Project**

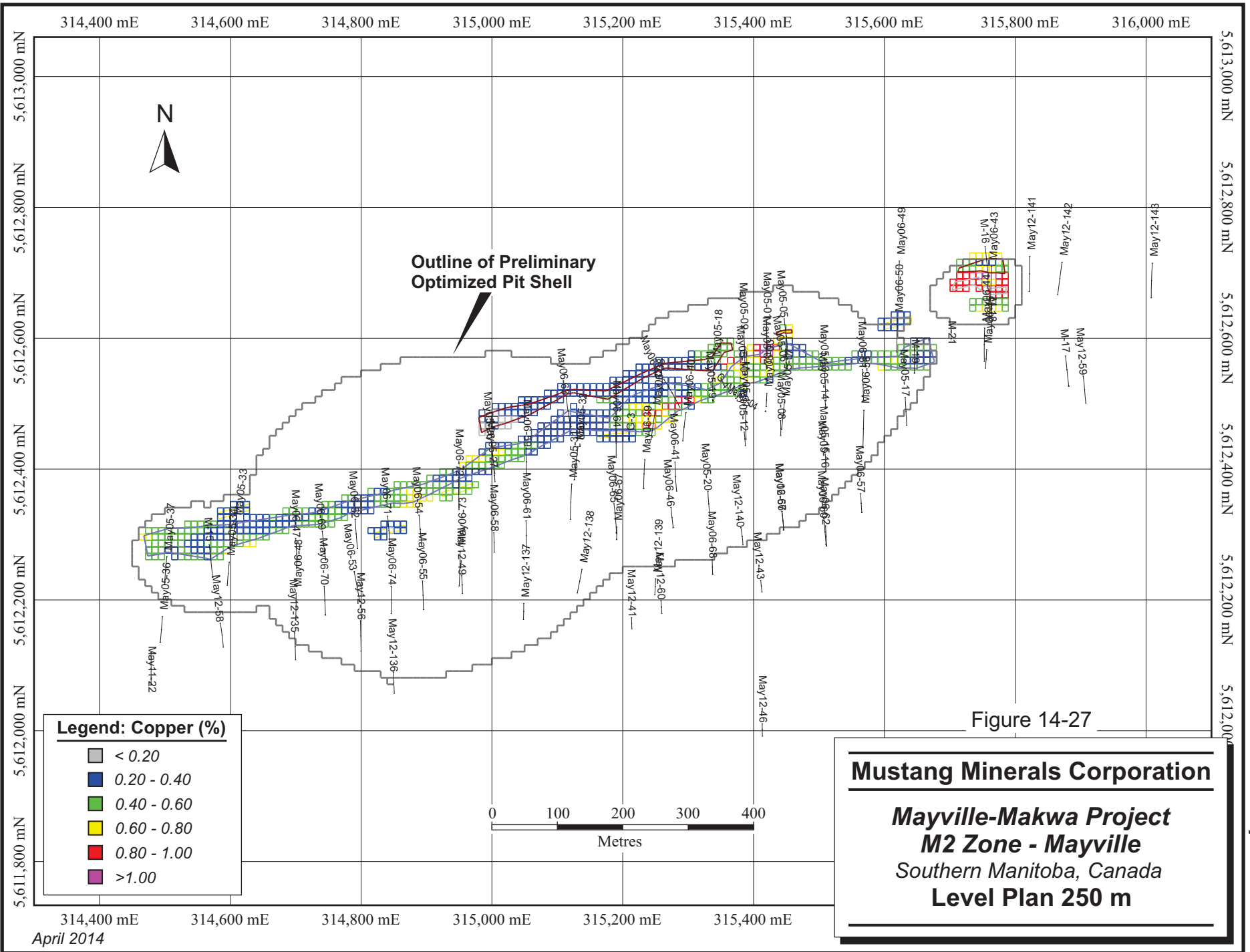
**M2 Zone - Mayville**

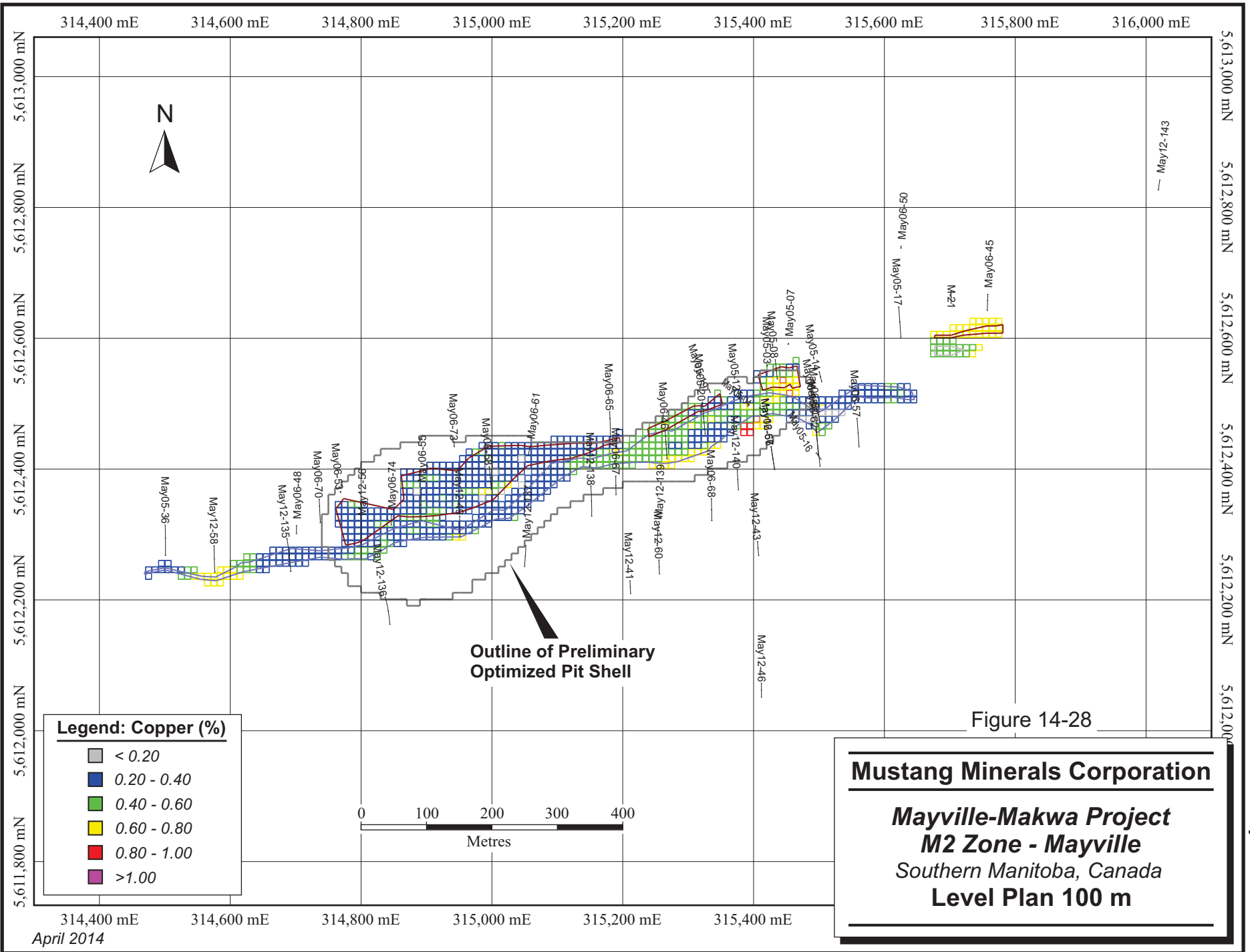
Southern Manitoba, Canada

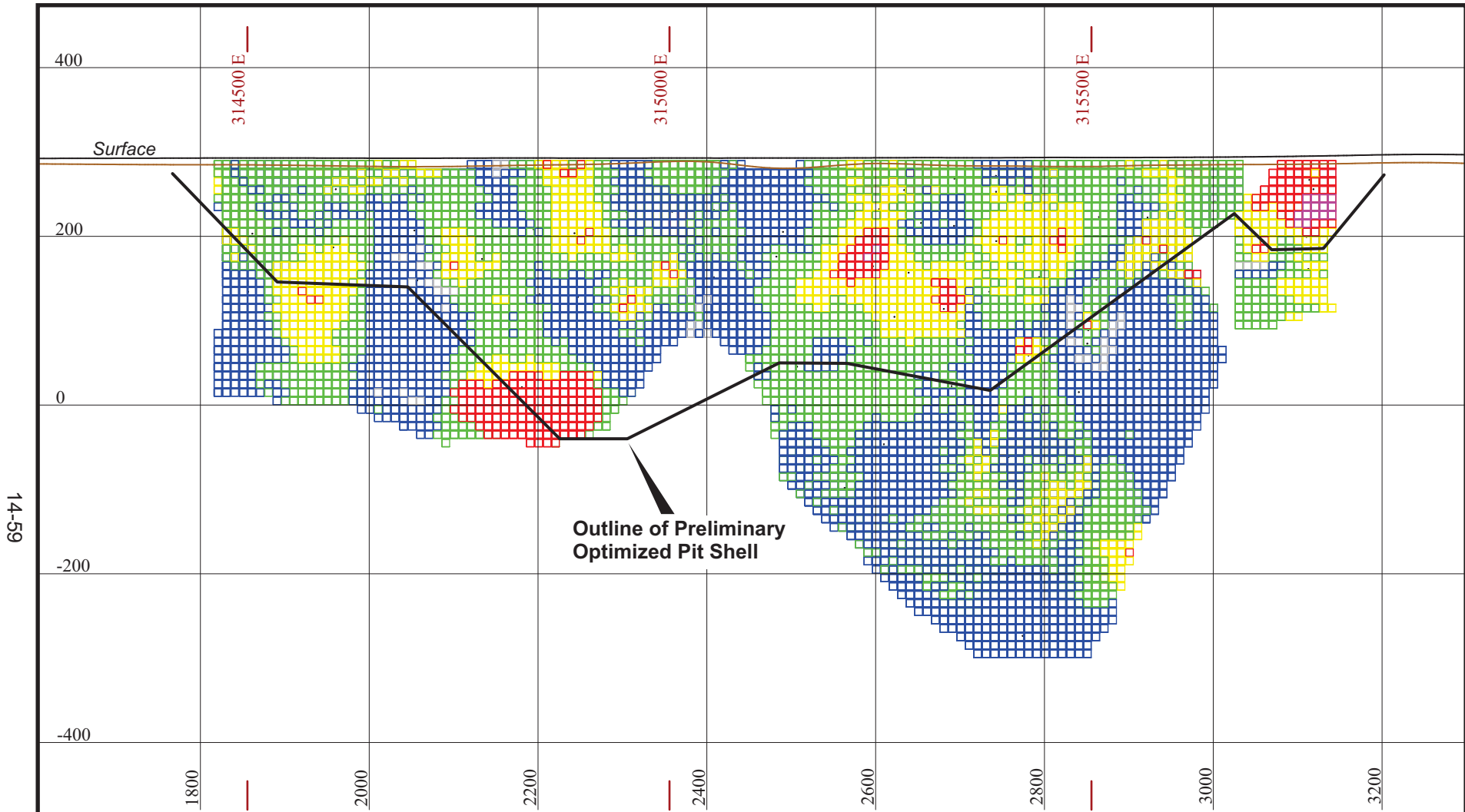
**Vertical Section 314965E**









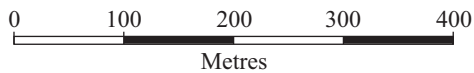


14-59

Figure 14-29

**Legend: Copper (%)**

Light Grey	< 0.20
Blue	0.20 - 0.40
Green	0.40 - 0.60
Yellow	0.60 - 0.80
Red	0.80 - 1.00
Purple	>1.00



**Mustang Minerals Corporation**

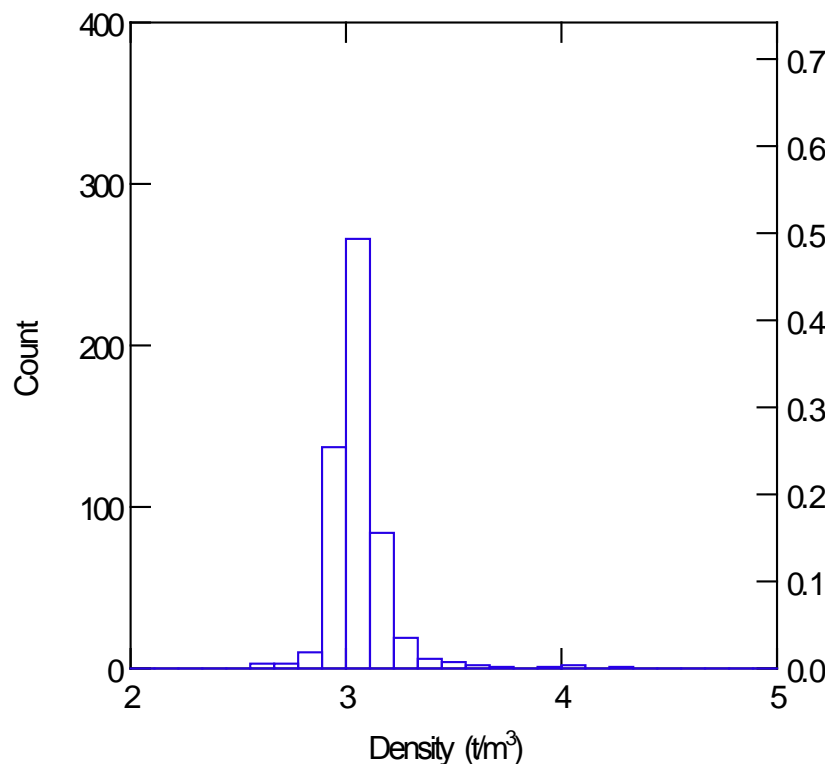
**Mayville-Makwa Project**  
**M2 Zone - Mayville**  
 Southern Manitoba, Canada  
**Vertical Longitudinal Section**

## DENSITY

The M2 Deposit drill hole database includes 1,454 density measurements made using the Archimedes method in the field by Mustang technicians. Of these, 19 holes totalling 539 measurements are located within the resource wireframe models. Basic statistics are listed below. A histogram of results is provided in Figure 14-30. Given these results, RPA chose to use a global tonnage factor of 3.0 t/m<sup>3</sup> for mineralization. Similar analysis suggests a tonnage factor of 2.95 t/m<sup>3</sup> for waste rock, which is used in the Whittle pit optimization discussed in the following subsections.

- Number of density measurements: 539
- Minimum density: 2.57 t/m<sup>3</sup>
- Maximum density: 4.33 t/m<sup>3</sup>
- Median density: 3.04 t/m<sup>3</sup>
- Density arithmetic mean: 3.06 t/m<sup>3</sup>
- Density standard deviation: 0.15 t/m<sup>3</sup>

**FIGURE 14-30 HISTOGRAM OF DENSITY MEASUREMENTS, MAYVILLE PROPERTY**



## BLOCK MODEL

The Gemcom block model consists of 220 columns, 173 rows, and 74 levels. The model origin (lower-left corner at highest elevation) is at UTM coordinates 314,090 mE, 5,611,571 mN and 340 m elevation. Block size is 10 m by 10 m by 10 m. A partial block model is used to manage blocks partially filled by mineralized rock types, including blocks along the edges of the deposit. A partial model has a parallel block model containing the percentage of mineralized rock types contained within each block. The block model contains the following information:

- Domain identifiers with zone;
- Estimated grades of nickel, copper, gold, platinum, and palladium inside the wireframe models;
- NSR estimates calculated from block grades and related economic and metallurgical assumptions;
- The percentage volume of each block within the mineralization wireframes;
- Tonnage factors, in tonnes per cubic metre, specific to each rock type;
- A classification attribute assigning the blocks to Indicated or Inferred;
- The average distance to the composites used to estimate the block grade; and
- The distance to the closest composite used to interpolate the block grade.

## NSR CUT-OFF VALUE

NSR factors were developed by RPA for the purposes of geological interpretation and resource reporting. NSR is the estimated value per tonne of mineralized material after allowance for metallurgical recovery and consideration of smelter terms, including payables, treatment charges, refining charges, price participation, penalties, smelter losses, transportation, and sales charges.

Input parameters used to develop the NSR factors have been derived from metallurgical testwork and smelter terms from comparable projects. These assumptions are dependent on the processing scenario, and will be sensitive to changes in inputs from further metallurgical testwork. Key assumptions are listed below:

- Metal prices:
  - US\$8.50 per pound of nickel
  - US\$3.40 per pound of copper
  - US\$1,800 per ounce of platinum
  - US\$1,650 per ounce of gold
  - US\$800 per ounce of palladium
- Recoveries based on preliminary metallurgical testing:
  - 40% Ni recovery
  - 90% Cu recovery

32% Pt recovery  
55% Au recovery  
80% Pd recovery

The net revenue from each metal was calculated and then divided by grade to generate an NSR factor. These NSR factors represent revenue (\$) per metal unit (per g/t Au, for example), and are independent of resource grade. RPA used the following factors to calculate NSR:

Ni	C\$41/% in 1t
Cu	C\$51/% in 1t

Within the updated resource block model, the low concentrations of the precious metals (Au, Pt, and Pd) are such that they do not contribute to the NSR value due to typical treatment and refining terms and penalties. While they have no influence on the cut-off value and reported resource tonnage, they are estimated on the assumption that local higher grade zones may be present within the resource area. These higher grade areas do contribute to the Whittle pit optimization process using the assumed treatment and refining terms and conditions and may potentially offer revenue enhancement at some future point.

These NSR factors were multiplied by block grades to calculate an NSR value (C\$ per tonne) for each block in the block model, which was compared directly to unit operating costs required to mine that block. For the purposes of developing an NSR cut-off value, a total unit operating cost of C\$15 per tonne milled was estimated, which includes processing, and general and administrative expenses.

## **CLASSIFICATION**

Definitions for Mineral Resource categories used in this Report are consistent with those defined by CIM (2010) and adopted by NI 43-101. In the CIM classification, a Mineral Resource is defined as “a concentration or occurrence of natural, solid, inorganic, or fossilized organic material in or on the Earth’s crust in such form and quantity and of such grade or quality that it has reasonable prospects for economic extraction”. Mineral Resources are classified into Measured, Indicated, and Inferred categories. A Mineral Reserve is defined as the “economically mineable part of a Measured or Indicated Mineral Resource demonstrated by at least a Preliminary Feasibility Study”. Mineral Reserves are classified into Proven and Probable categories. No Mineral Reserves have been estimated for the Property.

Resources were classified as Indicated or Inferred based on drill hole spacing and the apparent continuity of mineralization. Areas of the main mineralized zones are classified as Indicated where the continuity is well established with drill holes spaced at about 50 m (Figure 14-31). Inferred Resources are located in deeper areas of the Main and Footwall zones. All miscellaneous sub-zones were classified as Inferred. Mineralization located below the preliminary pit optimization shell was not classified as a Mineral Resource.

## MINERAL RESOURCE REPORTING

RPA updated the Mineral Resource for the M2 Deposit using drill hole data available as of November 27, 2013. Table 14-18 summarizes the Mineral Resources by zone and Table 14-19, by cut-off grade. The limits of the Mineral Resource estimate were constrained using a preliminary pit optimized shell generated in the Whittle software package.

**TABLE 14-18 MAYVILLE MINERAL RESOURCE SUMMARY BY ZONE AS OF NOVEMBER 27, 2013**  
Mustang Minerals Corp. – Makwa-Mayville Property

Zone	Tonnage (M t)	Ni (%)	Cu (%)	Au (g/t)	Pt (g/t)	Pd (g/t)	Eq Cu (%)	Ni (M lb)	Cu (M lb)	Au (k oz)	Pt (k oz)	Pd (k oz)
<b>Indicated</b>												
Main Zone	17.2	0.19	0.47	0.05	0.05	0.14	0.62	70.7	178.0	29	26	78
Footwall Zone	8.8	0.16	0.36	0.04	0.05	0.13	0.49	32.1	69.5	11	14	38
East Zone	0.6	0.20	0.64	0.11	0.07	0.17	0.81	2.6	8.4	2	1	3
<b>Total Indicated</b>	<b>26.6</b>	<b>0.18</b>	<b>0.44</b>	<b>0.05</b>	<b>0.05</b>	<b>0.14</b>	<b>0.58</b>	<b>105.5</b>	<b>255.8</b>	<b>42</b>	<b>42</b>	<b>119</b>
<b>Inferred</b>												
Main Zone	0.6	0.17	0.48	0.04	0.05	0.15	0.62	2.3	6.5	1	1	3
Footwall Zone	4.0	0.19	0.49	0.05	0.07	0.16	0.65	17.1	43.9	6	9	20
Miscellaneous	0.5	0.15	0.38	0.04	0.04	0.13	0.50	1.6	4.3	1	1	2
<b>Total Inferred</b>	<b>5.2</b>	<b>0.19</b>	<b>0.48</b>	<b>0.04</b>	<b>0.06</b>	<b>0.15</b>	<b>0.63</b>	<b>21.0</b>	<b>54.7</b>	<b>7</b>	<b>10</b>	<b>25</b>

Notes:

1. CIM definitions have been followed for classification of Mineral Resources.
2. Mineral Resources are reported at an NSR cut-off value of C\$15/tonne.
3. NSR values are calculated in C\$ using factors of \$51 per % Cu and \$41 per % Ni. These factors are based on metal prices of US\$3.40/lb Cu and US\$8.50/lb Ni, estimated recoveries and smelter terms, and a US\$/C\$ exchange rate of 0.97.
4. A minimum mining width of two metres was used.
5. Totals may not add correctly due to rounding.

**TABLE 14-19 MAYVILLE MINERAL RESOURCE SUMMARY BY NSR CUT-OFF AS OF NOVEMBER 27, 2013**  
**Mustang Minerals Corp. – Makwa-Mayville Property**

NSR Cut-off (C\$)	Tonnage (M t)	Ni (%)	Cu (%)	Au (g/t)	Pt (g/t)	Pd (g/t)	Eq Cu (%)	Ni (M lb)	Cu (M lb)	Au (k oz)	Pt (k oz)	Pd (k oz)
<b>Indicated</b>												
\$30	11.0	0.23	0.59	0.06	0.06	0.17	0.77	55.7	141.9	22	20	61
\$25	16.3	0.21	0.53	0.06	0.05	0.16	0.69	75.5	189.2	30	28	84
\$20	22.1	0.19	0.47	0.05	0.05	0.15	0.63	93.8	230.7	37	36	105
<b>\$15</b>	<b>26.6</b>	<b>0.18</b>	<b>0.44</b>	<b>0.05</b>	<b>0.05</b>	<b>0.14</b>	<b>0.58</b>	<b>105.5</b>	<b>255.8</b>	<b>42</b>	<b>42</b>	<b>119</b>
\$10	27.9	0.18	0.43	0.05	0.05	0.14	0.57	108.1	261.1	43	43	122
<b>Inferred</b>												
\$30	2.6	0.22	0.60	0.05	0.07	0.18	0.77	12.7	35.0	5	6	15
\$25	3.9	0.20	0.54	0.05	0.07	0.17	0.70	17.2	46.4	6	8	21
\$20	4.7	0.19	0.50	0.05	0.06	0.16	0.66	19.9	52.3	7	10	24
<b>\$15</b>	<b>5.2</b>	<b>0.19</b>	<b>0.48</b>	<b>0.04</b>	<b>0.06</b>	<b>0.15</b>	<b>0.63</b>	<b>21.0</b>	<b>54.7</b>	<b>7</b>	<b>10</b>	<b>25</b>
\$10	5.3	0.18	0.48	0.04	0.06	0.15	0.62	21.2	55.1	7	10	26

Notes: As per Table 14-15 above, with exception of Footnote 4. Mineral Resources in Table 14-16 are reported at NSR cut-off values as listed.

## MINERAL RESOURCE VALIDATION

RPA validated the block model by visual inspection, volumetric comparison, and swath plots. Visual comparison on vertical sections and plan views, and a series of swath plots found good overall correlation between the block grade estimates and supporting composite grades.

The estimated total volume of the wireframe models is 17,511,000 m<sup>3</sup>, while the volume of the block model at a zero grade cut-off is 17,516,000 m<sup>3</sup>. Results are listed by zone in Table 14-20.

**TABLE 14-20 VOLUME COMPARISON, MAYVILLE PROPERTY**  
**Mustang Minerals Corp. – Makwa-Mayville Property**

Zone	Volume Wireframes (m <sup>3</sup> x 1,000)	Volume Blocks (m <sup>3</sup> x 1,000)
MZ	9,473	9,483
FW	7,167	7,167
EZ_A	206	205
EZ_B	204	204
EZ_C	17	17
Other	444	440
<b>Total</b>	<b>17,511</b>	<b>17,516</b>



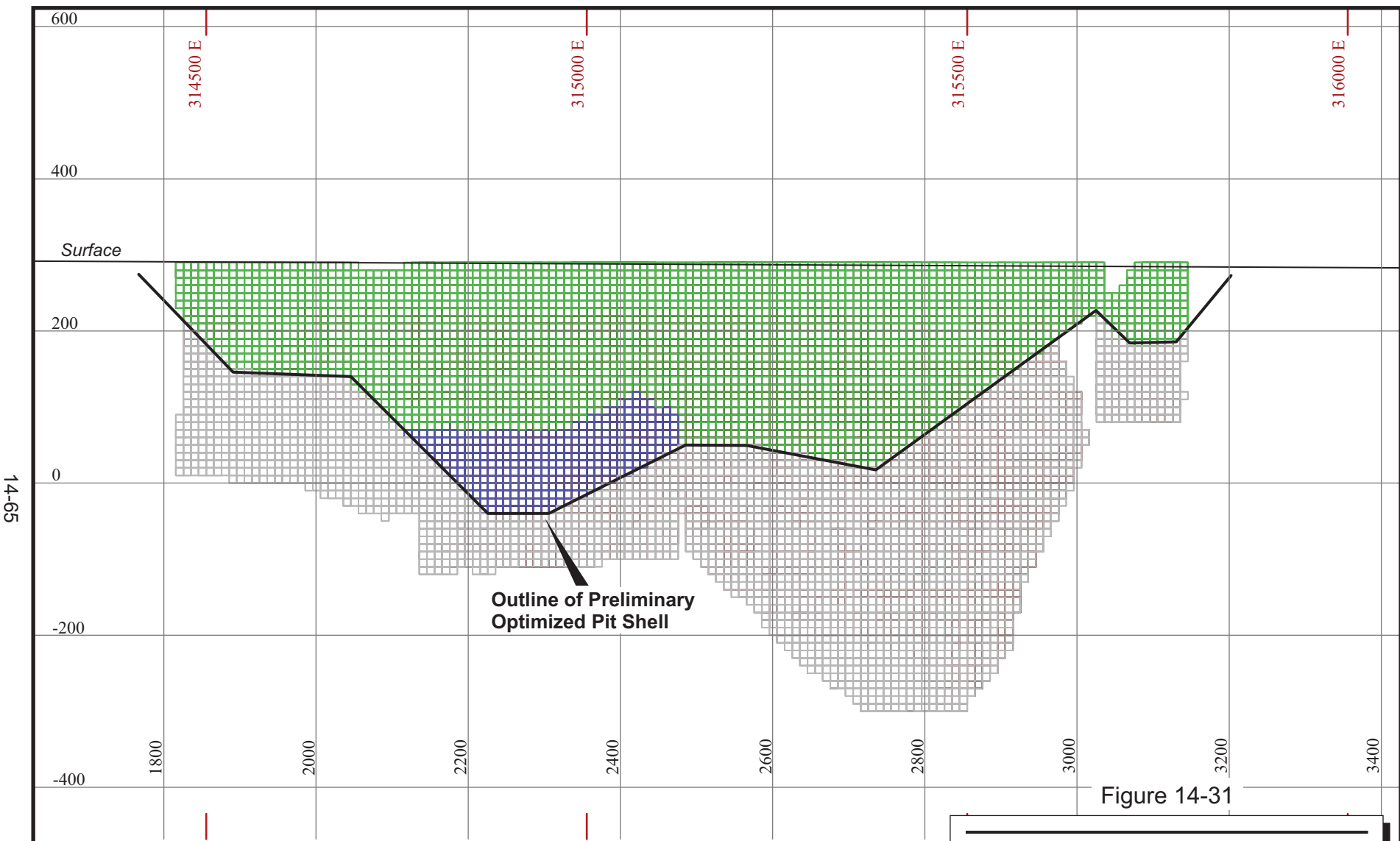
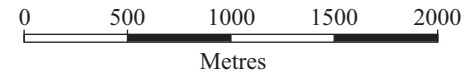


Figure 14-31

**Legend:**

- Indicated Mineral Resources
- Inferred Mineral Resources
- Not part of Mineral Resource



**Mustang Minerals Corporation**  
**Mayville-Makwa Project**  
**M2 Zone - Mayville**  
 Southern Manitoba, Canada  
**Mineral Resource Classification**  
**Longitudinal Section**

## COMPARISON WITH PREVIOUS ESTIMATE

Table 14-21 compares the current and previous estimates by RPA. The increase in tonnage is partly due to the decreased cut-off from \$20/t to \$15/t, plus a slightly deeper preliminary pit-shell. The deeper pit shell may also account for a difference in grades reported in the Inferred category.

**TABLE 14-21 COMPARISON TO PREVIOUS RPA MAYVILLE RESOURCE ESTIMATE**

**Mustang Minerals Corp. – Makwa-Mayville Property**

	<b>Tonnage (M t)</b>	<b>Ni (%)</b>	<b>Cu (%)</b>	<b>Au (g/t)</b>	<b>Pt (g/t)</b>	<b>Pd (g/t)</b>	<b>Ni (M lb)</b>	<b>Cu (M lb)</b>	<b>Au (k oz)</b>	<b>Pt (k oz)</b>	<b>Pd (k oz)</b>
<b>Dec 2012</b>											
Indicated	24.3	0.19	0.45	0.05	0.05	0.14	99.9	243.0	40	39	112
Inferred	4.1	0.18	0.45	0.04	0.06	0.15	16.1	41.0	6	8	20
<b>Nov 2013</b>											
Indicated	26.6	0.18	0.44	0.05	0.05	0.14	105.5	255.8	42	42	119
Inferred	5.2	0.19	0.48	0.04	0.06	0.15	21.0	54.7	7	10	25
<b>Difference</b>											
Indicated	2.3	-0.01	-0.02	0.00	0.00	0.00	5.5	12.8	2.4	2.7	6.9
Inferred	1.1	0.01	0.03	0.00	0.00	0.00	5.0	13.7	1.7	2.2	5.3
<b>Percent Difference</b>											
Indicated	9%	-4%	-4%	-3%	-2%	-3%	6%	5%	6%	7%	6%
Inferred	26%	4%	6%	3%	1%	0%	31%	33%	29%	28%	26%

## 15 MINERAL RESERVE ESTIMATE

There are currently no Mineral Reserves at the Project.

## 16 MINING METHODS

A conventional truck and shovel open pit mining method was chosen for Makwa and Mayville. Vegetation and topsoil will be cleared by dozers and graders preceding the mining operation. Suitable growth media material will be stockpiled for future reclamation use. For estimation purposes, it was assumed that a two metre thick layer of growth media is present on the Makwa and Mayville resource areas. When stripping activities are started, the actual thickness of the growth media will be determined, and the appropriate amount set aside. If any overburden needs to be stripped, then front end loaders will load off highway rigid-frame mining trucks, which will haul the overburden to the stockpile. The mineralized material and waste rock will be drilled and blasted, loaded with front end loaders and hauled with the same fleet of rigid frame mining trucks to either a crusher or waste rock pile. Ancillary activities managed by Mustang will include, but not be limited to road maintenance, road dust control, site dewatering, dump and stockpile maintenance, grade control at Makwa and Mayville, and tailings facility heavy equipment support in Mayville (as needed). The start date for mining operations has not been determined.

### MINE DESIGN

#### DILUTION

A 3% dilution factor was applied to the mineralized blocks in the model. Blocks in the model that did not contain any grade information were assigned an average grade of zero.

#### EXTRACTION

A 100% mining recovery factor was applied on the Whittle pit optimization and production schedule.

#### CUT-OFF VALUE

There are no Mineral Reserves at the Project. For the purpose of this PEA, RPA used Mineral Resources based on open pit mine designs. To arrive at the Mineral Resources that are potentially mineable, two separate cut-off values were used to generate the open pit production schedule: a US\$20.64/t NSR cut-off grade for Makwa and Mayville high grade mineralized material, and a US\$15.00/t NSR cut-off grade for Mayville low grade mineralized

material. Both categories of mineralized material are included in the open pit. The potentially mineable Mineral Resources at the two cut-off values used for this PEA are summarized in Table 16-1.

**TABLE 16-1 PEA MAKWA AND MAYVILLE MINERAL RESOURCES THAT ARE POTENTIALLY MINEABLE**

**Mustang Minerals Corp. – Makwa-Mayville Project**

PEA Resources By Cut-off	Cut-off Value	Mineralized Tonnes t (000)	Nickel Grade (% Ni)	Copper Grade (% Cu)	Gold Grade (g/t Au)	Platinum Grade (g/t Pt)	Palladium Grade (g/t Pd)	Cobalt Grade (% Co)
<b>Makwa</b>								
High Grade	20.64	7,612	0.569	0.122	0.000	0.094	0.334	0.015
Low Grade	15.00	-	-	-	-	-	-	-
<b>Mayville</b>								
High Grade	20.64	27,672	0.187	0.459	0.050	0.053	0.147	0.000
Low Grade	15.00	3,789	0.107	0.230	0.031	0.036	0.090	0.000
<b>Mustang Total</b>								
High Grade	20.64	35,284	0.270	0.386	0.039	0.062	0.187	0.003
Low Grade	15.00	3,789	0.107	0.230	0.031	0.036	0.090	0.000
Makwa Waste		60,376						
Mayville Waste		187,518						
Mustang Waste		247,893						
Makwa Total		67,988						
Mayville Total		218,978						
Mustang Total		286,966						

The economic analysis contained in this report is based, in part, on Inferred Resources, and is preliminary in nature. Inferred Resources are considered too geologically speculative to have mining and economic considerations applied to them and to be categorized as Mineral Reserves. There is no certainty that economic forecasts on which this PEA is based will be realized.

**BLOCK MODEL STATISTICS AND MODEL PARAMETERS**

The Makwa block model used in the pit optimization is a rotated regular block model including nickel, copper, platinum, palladium and cobalt grade estimates. The Mayville block model used in the pit optimization is a non-rotated percentage block model including nickel, copper, gold, platinum and palladium grade estimates. The block models were loaded into

Vulcan software separately and the appropriate rotation and variable definition was made. The list of relevant variables is presented in Table 16-2.

**TABLE 16-2 MAKWA AND MAYVILLE BLOCK MODEL STATISTICS**  
**Mustang Minerals Corp. – Makwa-Mayville Project**

Name	Description	Units	Value (Ranges Found in Block Models)
<b>Makwa</b>			
min_zone	Mineralized Zone		Massive (402); Disseminated (407); HW (403)
density	Density	t/m <sup>3</sup>	1.84 – 2.97
ni_cap_ok	Nickel Grade	%	0.01 – 2.24
cu_cap_ok	Copper Grade	%	0.01 – 0.52
pt_cap_ok	Platinum Grade	g/t	0.01 – 0.95
pd_cap_ok	Palladium Grade	g/t	0.01 – 1.93
co_cap_ok	Cobalt Grade	%	0.01 – 0.08
<b>Mayville</b>			
class	Resource Classification		2: indicated / 3: Inferred
percent	Ore percentage	%	0% - 100%
Density	Density	t/m <sup>3</sup>	1.7 Overburden / 2.9 Waste / 3.0 Mineralized
ni_id2	Nickel Grade	%	0.008 – 0.729
cu_id2	Copper Grade	%	0.029 – 1.671
au_id2	Gold Grade	ppb	0.205 – 258.471
pt_id2	Platinum Grade	ppb	2.407 – 208.653
pd_id2	Palladium Grade	ppb	7.249 – 428.393

### PIT OPTIMIZATION

Open pit optimization was conducted on the Mineral Resources to determine the potential pit limits. The pit optimization was done using the Whittle Pit Optimization. Blocks classified as Measured, Indicated, and Inferred Resources were included in the pit optimization process.

The pit optimization parameters used for the PEA are listed in Table 16-3.

**TABLE 16-3 PEA PIT OPTIMIZATION PARAMETERS**  
**Mustang Minerals Corp. – Makwa-Mayville Project**

Pit Optimization Parameter	Units	Makwa Values	Mayville Values
Vulcan Block Size	m	10x5x5	10x10x10
Whittle Block Size	m	10x10x10	10x10x10
Mining Extraction	%	100.0%	100.0%
Mining Dilution (Grade)	%	3%	3%
Pit slopes, IRA	°	22- 52	52
Nickel Price	US\$/lb	8.5	8.5
Copper Price	US\$/lb	3.4	3.4
Gold Price	US\$/oz	1,650	1,650
Platinum Price	US\$/oz	1,800	1,800
Palladium Price	US\$/oz	800	800
Cobalt Price	US\$/oz	14.0	14.0
Nickel Recovery	%	16.22 x ln (Ni) + 79.68	40%
Copper Recovery	%	80%	90%
Gold Recovery	%	-	55%
Platinum Recovery	%	7.21 x ln (Pt) + 81.01	32%
Palladium Recovery	%	6.05 x ln (Pd) + 81.01	80%
Cobalt Recovery	%	34.84 x ln (Co) + 188.63	-
<b>Costs</b>			
Mining Cost	US\$/t	2.0	2.0
Process Cost	US\$/t	12.5	12.5
G&A Cost	US\$/t	2.5	2.5
Ore Transport Cost	US\$/t	5.64	
Concentrate Freight	US\$/t con	100.0	100.0
Treatment Charge, Nickel Con.	US\$/t con	366.0	366.0
Treatment Charge, Copper Con.	US\$/t con	-	85.0
Nickel Refining Charges	US\$/lb	0.70	0.70
Copper Refining Charges, Nickel Con.	US\$/lb	0.50	0.50
Copper Refining Charges, Copper Con.	US\$/lb	-	0.09
Gold Refining Charges	US\$/oz	-	5.0
Platinum Refining Charges	US\$/oz	15.0	15.0
Palladium Refining Charges	US\$/oz	15.0	15.0
Cobalt Refining Charges, Nickel Con.	US\$/lb	2.75	-
Copper Concentrate Grade	%Cu		30.0%
Nickel Concentrate Grade	%Ni	10.5%	10.0%
Nickel Payable in Ni Con / Cu Con	%	89% / -	89% / 0%
Copper Payable in Ni Con / Cu Con	%	75% / -	75% / 97%
Gold Payable in Ni Con / Cu Con	%	- / -	80% / 90%
Platinum Payable in Ni Con / Cu Con	%	75% / -	75% / 70%
Palladium Payable in Ni Con / Cu Con	%	80% / -	80% / 70%
Cobalt Payable in Ni Con / Cu Con	%	50% / -	- / -

## PIT DESIGN

The Mineral Resources that are potentially mineable in the open pit include a total 35.3 Mt of high grade mineralized material (at cut-off value of US\$20.64/t), and the other 3.8 Mt of low grade mineralized material (at cut-off value of US\$15.00/t). The total mineralized material for Makwa and Mayville is 39.1 Mt at an average nickel grade of 0.25% and an average copper grade of 0.37%, consisting of 33.6 Mt of Indicated Mineral Resources and 5.4 Mt of Inferred Mineral Resources as presented in Table 16-4.

The potentially mineable material at Makwa includes 7.6 million tonnes of mineralized high grade material above a cut-off value of US\$20.64/t grading 0.57% Ni and 0.12% Cu. The total material in the Makwa pit, including waste and mineralized material, is equal to 68 million tonnes. The overall waste to mineralized material stripping ratio is 7.9:1.

The potentially mineable material at Mayville includes 27.7 million tonnes of mineralized high grade material above a cut-off value of US\$20.64/t grading 0.19% Ni and 0.46% Cu. The pit also contains low grade material above a cut-off value of \$15.0/t totalling 3.8 Mt grading 0.11% Ni and 0.23% Cu. The total material in the Mayville pit, including waste and mineralized material, is equal to 219 million tonnes. The overall waste to mineralized material stripping ratio is 6.0:1.

The Mineral Resources that are potentially mineable in this PEA, as detailed in Table 16-2, account for any mining dilution and extraction losses.

Figures 16-1 and 16-2 show the ultimate pit, dump layout, block model outline, and the cross section locations for Makwa and Mayville, respectively. Figures 16-3 and 16-4 show the Makwa and Mayville typical cross sections with the pit optimization, the pit design and block model grades, respectively.

The Mineral Resource classification used for the PEA is summarized in Table 16-4. Table 16-5 summarizes the pit design parameters used in the PEA.

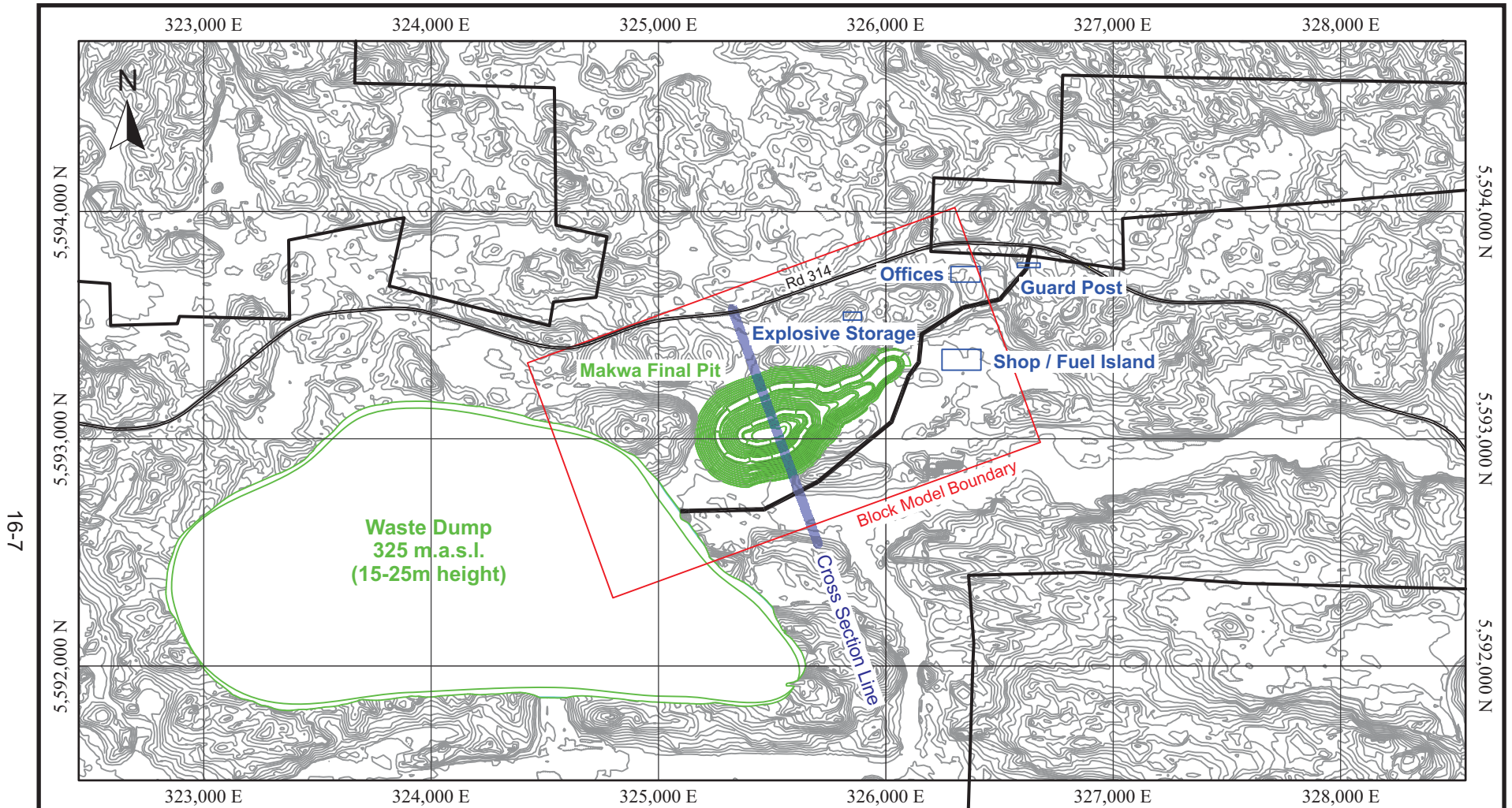


**TABLE 16-4 PEA PIT MINERALIZATION CLASSIFICATION SUMMARY FOR  
MAKWA AND MAYVILLE PITS  
Mustang Minerals Corp. – Makwa-Mayville Project**

PEA Resource By Classification	Mineralized Tonnes t (000)	Nickel Grade (% Ni)	Copper Grade (% Cu)	Gold Grade (g/t Au)	Platinum Grade (g/t Pt)	Palladium Grade (g/t Pd)	Cobalt Grade (% Co)
Makwa							
Measured							
Indicated	6,894	0.601	0.126	0.000	0.098	0.354	0.015
Inferred	719	0.264	0.081	0.000	0.049	0.140	0.014
Mayville							
Measured							
Indicated	26,739	0.178	0.426	0.049	0.049	0.138	0.000
Inferred	4,722	0.176	0.460	0.043	0.059	0.149	0.000
Mustang Total							
Measured							
Indicated	33,632	0.265	0.365	0.039	0.059	0.183	0.003
Inferred	5,441	0.188	0.410	0.038	0.058	0.148	0.002
Makwa Waste	60,376						
Mayville Waste	187,518						
Mustang Waste	247,893						
Makwa Total	67,988						
Mayville Total	218,978						
Mustang Total	286,966						

**TABLE 16-5 MAKWA AND MAYVILLE PIT DESIGN OVERVIEW  
Mustang Minerals Corp. – Makwa-Mayville Project**

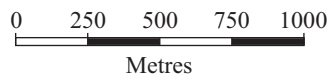
Pit Dimensions	Makwa Pit	Mayville Pit
Pit Length (m)	1,000	1,500
Pit Width (m)	520	500
Surface Area (m <sup>2</sup> )	322,000	634,000
Maximum Pit Depth (m)	206	330.0
Pit Bottom Elevation (masl)	90.1	-30.0
Pit Exit Elevation (masl)	294.0	290.0
Average Ramp Grade (%)	10	10
Ramp Width double-lane (m)	27	27
Ramp Width single-lane (m)	20	20
Overall Highwall Slope (°)	42 north / 49 south	49
Mining Bench Height (m)	5	10
3D Model Block Size (m)	10 m x 5 m x 5 m	10 m x 10 m x 10 m
Type Benching (berming)	Double benching	Single benching

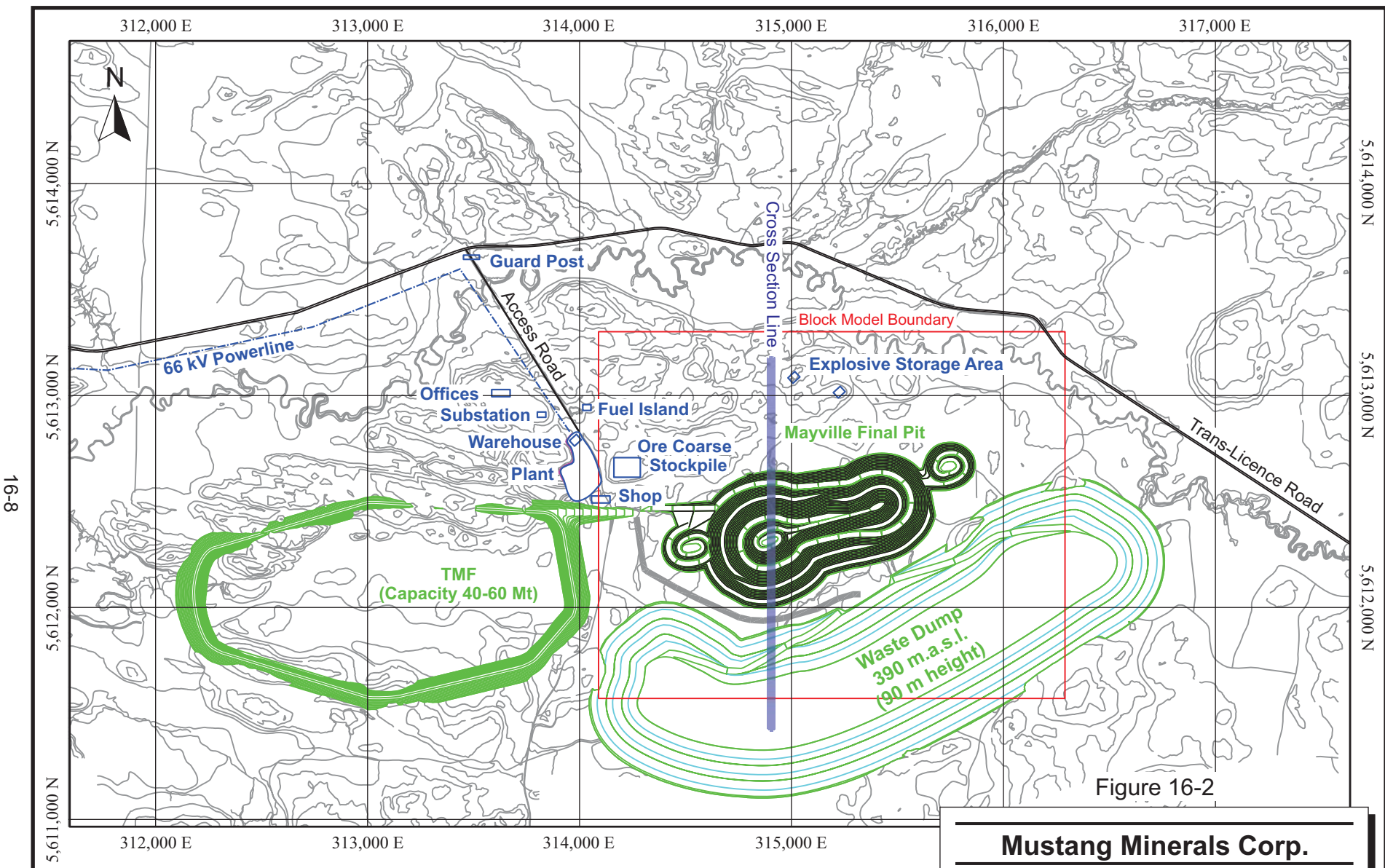


16-7

Figure 16-1

**Mustang Minerals Corp.**  
**Mayville-Makwa Project**  
 Southern Manitoba, Canada  
**Makwa Ultimate Pit Showing**  
**Cross Section Line**





16-8

Figure 16-2

**Mustang Minerals Corp.**  
**Mayville-Makwa Project**  
Southern Manitoba, Canada  
**Mayville Ultimate Pit Design**  
**Showing Cross Section Line**

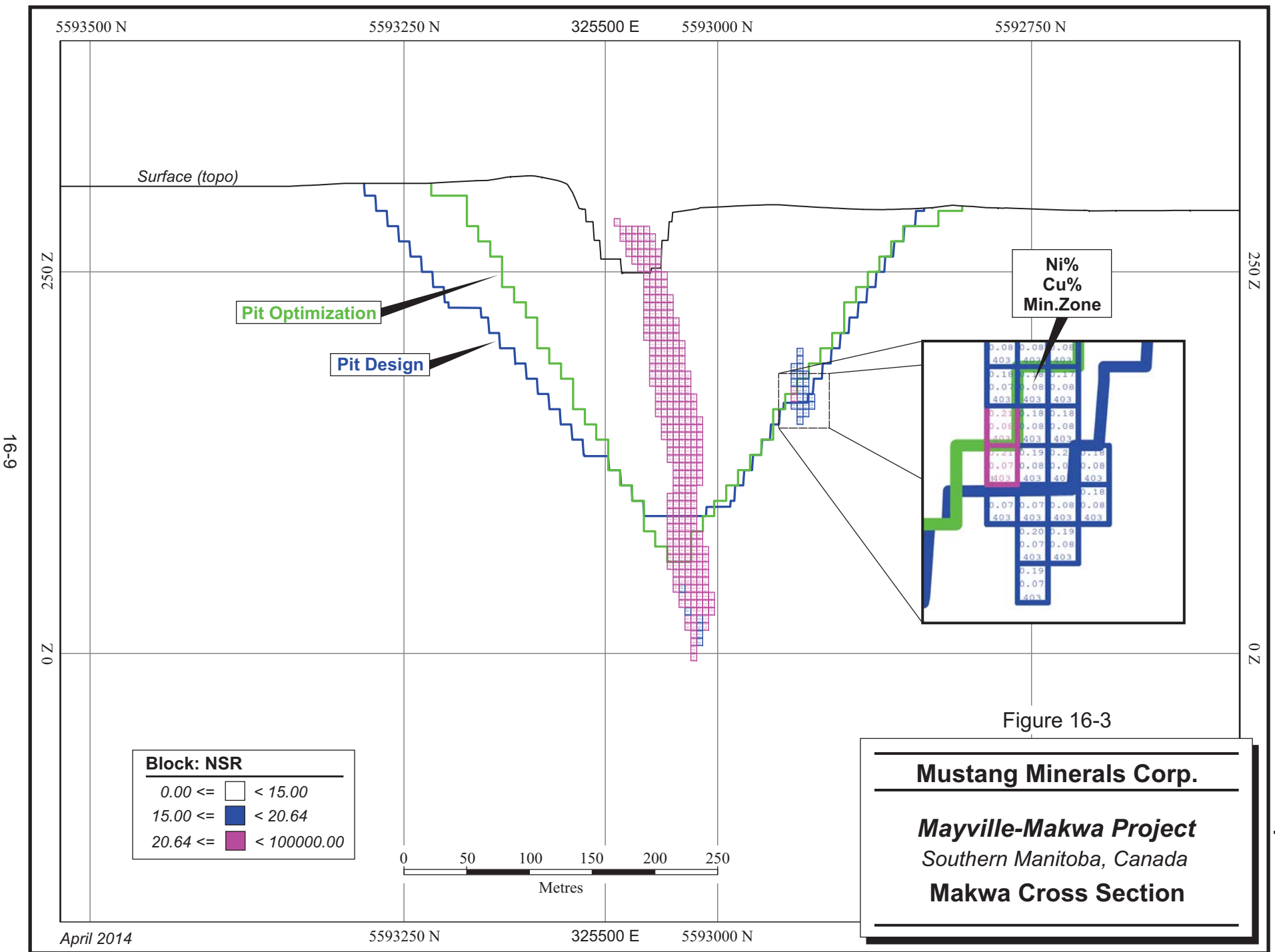


Figure 16-3

**Mustang Minerals Corp.**

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**Mayville-Makwa Project**  
 Southern Manitoba, Canada

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**Makwa Cross Section**

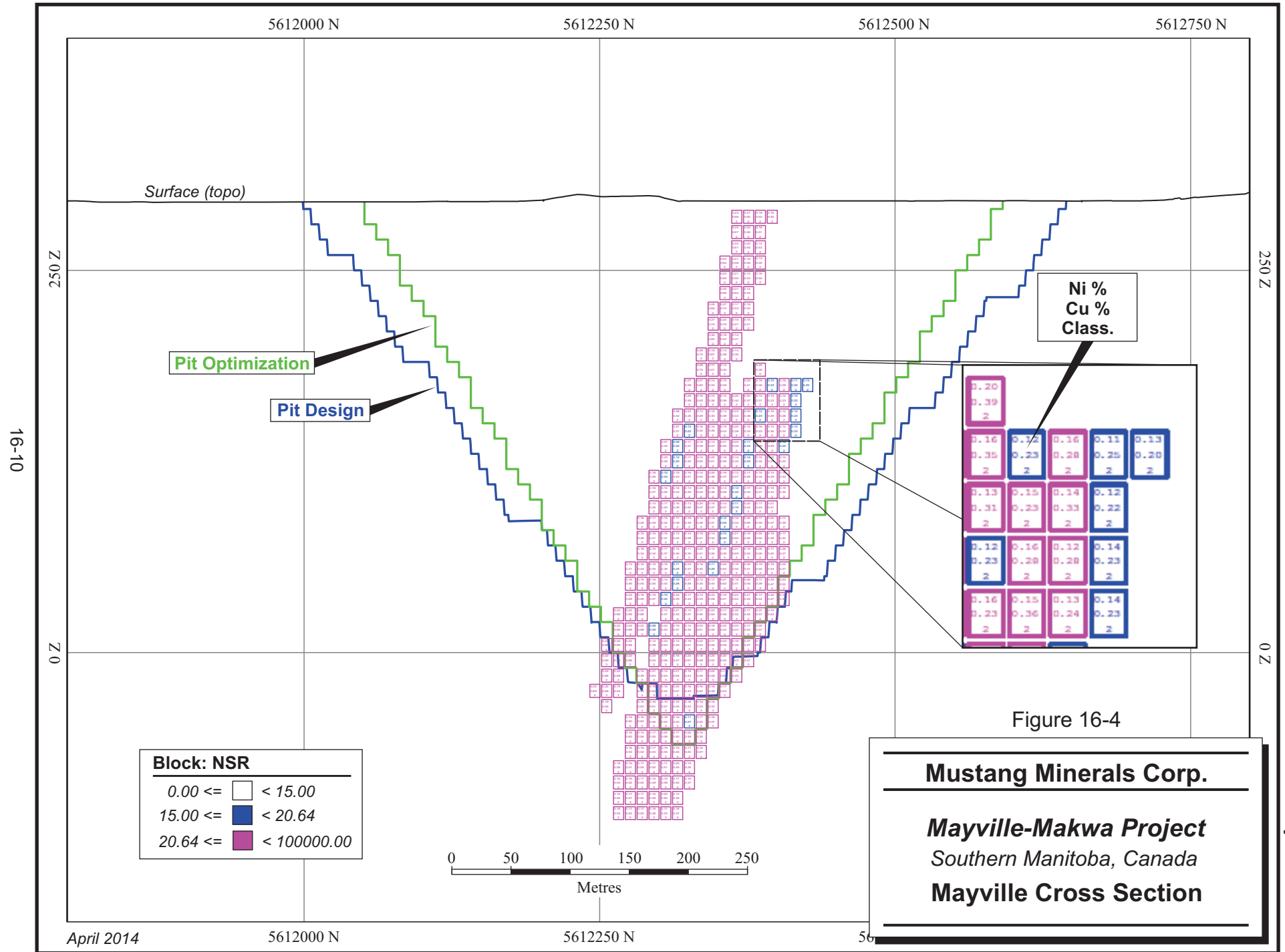


Figure 16-4

**Mustang Minerals Corp.**

*Mayville-Makwa Project*  
Southern Manitoba, Canada

**Mayville Cross Section**

## **GEOMECHANICS**

### ***MAKWA PIT WALL SLOPES***

Whittle pit optimizations used a 49° slope on the north wall and 52° on the south wall. Pit design slopes vary based on the attitude of the mineralization and access ramp location. Average design highwall slopes are shown below:

- Northeast Wall: 42°
- Southeast Walls: 49°

The Golder Technical Memorandum dated October 7, 2009 is recommending 52° to 56° inter-ramp angle for rock, additionally rock catch fall berms of 9 m to 12 m every 90 m to 120 m vertical. The current pit design is following this recommendation.

### ***MAYVILLE PIT WALL SLOPES***

Whittle pit optimizations used a 52° slope for the Mayville highwalls. Pit design slopes vary based on the attitude of the mineralization and access ramp configuration. The average design highwall slopes is 49°. There is no pit slope analysis for Mayville, however, the Makwa pit slope recommendations were followed for the Mayville pit design.

### ***RAMP DESIGN***

The dimensions of the loaders, haul trucks and excavators were evaluated to define the minimum mining width and the ramp design. Ramp road grades were limited to 10% or less. Road widths were designed at 27 m for the upper part of the pit and 20 m for the bottom benches, the truck overall width is about 6.5 m.

### ***MINIMUM MINING WIDTH***

A minimum mining width of 30 m was used for the pit designs. This width must be honored to ensure safe loading and hauling.

## **WASTE DUMP DESIGN**

The rock waste piles were designed to contain the capacity of material that will be excavated over the Life of Mine (LOM). The parameters that were used for the rock waste pile designs are summarized in Table 16-6.

**TABLE 16-6 MAKWA AND MAYVILLE WASTE DUMP DESIGN**  
**Mustang Minerals Corp. – Makwa-Mayville Project**

<b>Waste Dump Design</b>	<b>Units</b>	<b>Makwa Dumps</b>	<b>Mayville Dumps</b>
Road Grade	%	10	10
Minimum Road Width	m	27	27
Catch Bench	m	-	30 m berm every 30 m
Material Swell	%	35	35
Overall slope	deg.	-	25
Lift slope	deg.	35	35
Maximum dump height	m	20	90
Setback from pit crests	m	200	50
Capacity	Mt	100	240

The waste dumps and the stockpile will have a perimeter ditch around the toe to capture water run-off. The dump will be constructed in 30 m high lifts for Mayville.

RPA has considered a rather conservative design for the waste dumps to ensure their long term stability. The maximum height of the dumps will be limited to less than 90 m at Mayville and 20 m at Makwa.

The 30 m berm on the waste rock pile has been included to assist in the mine reclamation and closure process for Mayville.

In order to confirm that the location of the waste rock piles and ROM stockpile at Makwa and Mayville do not restrict access to potential mineralization, RPA recommends that condemnation drilling be performed over the location of the latest design of the stockpile and dump footprints.

## **MINE SCHEDULE**

Mining operations will consist of stripping and overburden removal, drilling and blasting, and loading and hauling. Ancillary activities will include road maintenance, site dewatering, waste dump, stockpile maintenance, and grade control.

Mustang plans to operate its own fleet of mining equipment and a contractor will be used to haul mineralized material from the Makwa Property to the Mayville Property, which is a

distance of approximately 43 km. Mining contractors may be utilized for open pit pre-stripping or tailings dam construction.

## **LOM PRODUCTION SCHEDULE**

The temperatures, precipitation, topographical relief, and altitude will not adversely affect mining operations at the Makwa-Mayville Project. The Project is located in a temperate region of Canada, which receives moderate precipitation. Topography at the Project site is gentle, and it is located at a nominal elevation of 300 MASL (984 FASL). Both Project area open pits will require dewatering. These dewatering quantities will be determined during the pre-feasibility stage of the Project's development.

### ***PRE-PRODUCTION***

Pre-production mineralized and waste material is estimated to be 15 Mt at Makwa during Year -1. No production occurs during Year -2 of the pre-production period.

Much of the waste material mined during pre-stripping at Mayville will be used in the building of the tailings facility and pond foundations. Mayville waste acid generating and neutralizing characteristics need to be determined.

### ***PRODUCTION***

Mining of mineralized material will occur at a rate ranging from 6,000 tpd to 12,300 tpd, or 2.2 million to 4.5 million tonnes per year. The detailed mine production schedule for the Makwa-Mayville Project outlines the quantities of mineralized material and waste rock that will be mined from the Makwa and Mayville resource area. The plan also identifies the nickel and copper mineralization at two separate NSR cut-off values: US\$20.64/t for mineralized material at Makwa, and US\$15.0/t for low grade mineralized material and US\$20.64/t for high grade mineralized material at Mayville.

The detailed mine production schedule was established on a year-by-year basis for the mine life. The mine production schedule is presented in Table 16-7 and provides a yearly summary of the tonnages and grades used in this PEA. Mayville mine life will be eight years plus four years of stockpile processing. Makwa mine life will be four years.

Low grade mineralized material will be hauled to the low grade stockpile at Mayville, based on a NSR cut-off value above 15\$/t and below 20.64\$/t. There are no plans to have a low grade stock pile at Makwa. Currently, it has been estimated that 3.8 Mt of low grade



mineralized material will be stockpiled and processed at the end of the mine life. This low grade material was included in the production schedule, and it represents 10% of the total processed material.

**TABLE 16-7 MAKWA-MAYVILLE COMBINED MINE PRODUCTION SCHEDULE**  
 Mustang Minerals Corp. – Makwa-Mayville Project

Material Description	Units	Totals	Yr -1	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Yr 11	Yr 12	Yr 13
Makwa Mineralized Tonnes	t (000)	7,612	667	2,208	2,553	1,299	884									
Average Ni Grade	%	0.569	0.483	0.525	0.531	0.681	0.696									
Average Cu Grade	%	0.122	0.104	0.112	0.125	0.14	0.127									
Average Au Grade	g/t	0.000	0.000	0.000	0.000	0.000	0.000									
Average Pt Grade	g/t	0.094	0.094	0.089	0.095	0.096	0.099									
Average Pd Grade	g/t	0.334	0.314	0.303	0.331	0.371	0.376									
Average Co Grade	%	0.015	0.015	0.014	0.015	0.014	0.014									
Makwa Waste Tonnes	t (000)	60,376	14,333	19,792	17,389	6,701	2,161									
Makwa Total Tonnes	t (000)	67,988	15,000	22,000	19,943	8,000	3,045									
Strip Ratio	W:O	7.93		8.96		5.16	2.45									
Mayville Mineralized Tonnes	t (000)	31,461			1,655	3,252	2,618	1,589	2,911	1,805	3,853	2,194	2,578	3,952	2,298	2,755
Average Ni Grade	%	0.177			0.189	0.179	0.194	0.181	0.182	0.155	0.161	0.171	0.177	0.178	0.181	0.183
Average Cu Grade	%	0.431			0.490	0.481	0.507	0.469	0.474	0.363	0.332	0.377	0.389	0.404	0.441	0.495
Average Au Grade	g/t	0.048			0.052	0.054	0.067	0.055	0.056	0.043	0.039	0.041	0.042	0.042	0.044	0.046
Average Pt Grade	g/t	0.051			0.044	0.043	0.051	0.053	0.048	0.042	0.046	0.049	0.051	0.054	0.058	0.068
Average Pd Grade	g/t	0.140			0.132	0.132	0.148	0.152	0.147	0.110	0.121	0.134	0.142	0.148	0.156	0.158
Average Co Grade	%	-			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mayville Waste Tonnes	t (000)	187,518			6,402	18,748	24,337	28,411	27,089	28,195	26,147	9,806	7,422	6,048	2,702	2,211
Mayville Total Tonnes	t (000)	218,978			8,057	22,000	26,955	30,000	30,000	30,000	30,000	12,000	10,000	10,000	5,000	4,966
Strip Ratio	W:O	5.96			3.87	5.77	9.30	17.88	9.30		6.79	4.47		1.53	1.18	0.80
Mustang Mineralized Tonnes	t (000)	39,073	667	2,208	4,208	4,551	3,502	1,589	2,911	1,805	3,853	2,194	2,578	3,952	2,298	2,755
Average Ni Grade	%	0.254	0.483	0.525	0.396	0.322	0.320	0.181	0.182	0.155	0.161	0.171	0.177	0.178	0.181	0.183
Average Cu Grade	%	0.371	0.104	0.112	0.269	0.383	0.411	0.469	0.474	0.363	0.332	0.377	0.389	0.404	0.441	0.495
Average Au Grade	g/t	0.039	-	-	0.021	0.038	0.050	0.055	0.056	0.043	0.039	0.041	0.042	0.042	0.044	0.046
Average Pt Grade	g/t	0.059	0.094	0.089	0.075	0.058	0.063	0.053	0.048	0.042	0.046	0.049	0.051	0.054	0.058	0.068
Average Pd Grade	g/t	0.178	0.314	0.303	0.253	0.201	0.206	0.152	0.147	0.110	0.121	0.134	0.142	0.148	0.156	0.158
Average Co Grade	%	0.003	0.015	0.014	0.009	0.004	0.004	-			-		-	-	-	-
Mustang Waste Tonnes	t (000)	247,893	14,333	19,792	23,792	25,449	26,498	28,411	27,089	28,195	26,147	9,806	7,422	6,048	2,702	2,211
Mustang Total Tonnes	t (000)	286,966	15,000	22,000	28,000	30,000	30,000	30,000	30,000	30,000	30,000	12,000	10,000	10,000	5,000	4,966
Strip Ratio	W:O	6.34		8.96		5.59	7.57	17.88	9.30		6.79	4	2.88	53	1.	0.80

**MINE EQUIPMENT**

The estimated equipment list is presented in Table 16-8 for the Makwa and Mayville open pits. The mine and roads are designed for 100-ton (90.7 tonne) trucks, which is a common equipment size. Truck size used at Makwa and Mayville may vary, depending on the best capital price that can be obtained. A cost benefit analysis has indicated, that due to the moderate mine life, it is advantageous for Mustang to purchase its own mine equipment, because of the impact that the capital cost and operating costs would have on the cash flow.

An explosives contractor or mining contractor will provide all the blasting equipment; including all bulk (blasting agents) loading trucks. Capital and operating costs of mobilizing this specialized equipment, and maintaining these facilities and equipment was included as part of direct blasting unit operating costs.

**TABLE 16-8 MINING EQUIPMENT  
Mustang Minerals Corp. – Makwa-Mayville Project**

Type	Item	Initial	Maximum
<b><i>Operations (Typical)</i></b>			
Rotary Drill	DM45	2	3
Loader	Cat 992 FEL (Example)	2	4
Haul Truck	Cat 777 Truck (Example)*	40	20
<b><i>Support (Typical)</i></b>			
Grader	Cat 16 Grader	2	3
Track Dozer	Cat D9 Dozer	3	6
Water Truck	7,000 gal	1	4
Loader	Cat 988	1	1

\* Number is dependent on equipment availabilities and utilizations, and haul distances.

The following criteria were used to evaluate mine fleet requirements as summarized in Table 16-9.

**TABLE 16-9 FLEET REQUIREMENT ESTIMATION CRITERIA  
Mustang Minerals Corp. – Makwa-Mayville Project**

Equipment Estimation Criteria	Units	Makwa	Mayville
Moisture Content	%	5	5
Bucket Fill Factor	%	85	85
Swell Factor		1.35	1.35
Truck Size	t	90	90
Loader Bucket Size	m <sup>3</sup>	12.2	12.2
Average fix time: loading, wait, and dumping)	min	7.9	7.9
Mechanical Availability	%	85	
Equipment Utilization	%	95	

### MINING SCHEDULE AND MANPOWER

Mining operations for the Makwa-Mayville Project will be 365 days per year, operating on a two shift basis of two, 12-hour shifts per day. The mine plan, fleet requirements, and manpower are based on this work schedule. Table 16-10 shows a mining manpower summary.

**TABLE 16-10 MINING MANPOWER SUMMARY  
Mustang Minerals Corp. – Makwa-Mayville Project**

Description	Initial	Maximum
MINE OPERATIONS		13
MAINTENANCE PLANNING & ADMIN.		2
ENGINEERING		5
GEOLOGY		7
<b>EQUIPMENT OPERATORS</b>		
Drill Operator	7	10
Loading Operator	8	15
Haul Truck Operator	13	72
Support Equip. Operator	18	42
<b>Subtotal</b>	<b>46</b>	<b>139</b>
<b>MAINTENANCE</b>		
Light Vehicle Mechanic	2	2
Tiremen	1	1
Overhaul Laborer*	12	17
Maintenance Laborer*	14	19
Service, Fuel & Lube Men	4	4
<b>Subtotal</b>	<b>32</b>	<b>43</b>

## **DEWATERING**

Preliminary hydrogeological studies indicate that the potential open pits will intercept the water table, and all surface water will be absorbed by the fractures in the pit. Given these findings, dewatering is considered for the Makwa and Mayville resource pits. The amount of dewatering for the Mayville and Makwa pits will be determined after the hydrological studies. For this PEA, RPA has assumed that 45 L/s will be pumped from the Makwa pit area, and 30-45 L/s will be pumped from the Mayville pit area.

## **MINE INFRASTRUCTURE**

Mine infrastructure is addressed in Section 18 - Project Infrastructure of this report. It is assumed that Mustang will supply office trailers, a four-bay shop, portable compressors and use shipping containers for some of the warehouse storage. The overall long-term impact to the environment should be minimal. All mine infrastructure will need to be well insulated.

Water will be supplied by Mustang via water wells, pipeline and water tanks. Electrical connections for the mine will be provided by Mustang via a power line that originates approximately 8 km west of the Mayville Project area.

## 17 RECOVERY METHODS

Based on metallurgical testwork and the prospect of mining Makwa, followed by Mayville, the Makwa Mayville concentrator is designed to process mineralized material from both projects in sequence or batching. Further testwork should be completed to determine if the Makwa and Mayville mineralized material can be blended. The concentrator location is proposed to be at the Mayville site, with associated tailings management facilities (TMF) located there. Mineralized material will be trucked from Makwa to the Mayville concentrator.

The proposed design throughput is 8,600 tpd based on 96% availability. This equates to three million tonnes mineralized material per calendar year throughput.

Makwa mineralized material will produce a single concentrate comprising mainly nickel (10% Ni) containing also copper, gold, and PGMs.

Mayville mineralized material will produce two concentrates, nickel and copper.

The concentrator will be designed to provide additional required space for regrind, cleaner flotation, copper concentrate thickening, filtering, and copper concentrate storage required for Mayville ore. As well, valving will be added to provide for easier piping rerouting of flotation circuits when required.

The proposed flowsheet showing two phases of operation, Makwa (Phase 1) and Mayville (Phase 2), is shown in Figure 17-1.

Construction will be in two phases, with the modifications required for Phase 2 (modifications for Mayville processing) installed as much as possible during operation in year 1. Transfer to Mayville mineralized material processing is assumed to be achieved fairly quickly, in under a month.

## **MAKWA (PHASE 1)**

The concentrator consists of conventional multistage crushing followed by two stage grinding in closed circuit with hydrocyclones.

Cyclone product will go to a rougher/scavenger flotation circuit. The rougher concentrate will be sent to a cleaner flotation circuit. The resulting final concentrate will be thickened, filtered and dried, and stored in a concentrate storage area. The concentrate will be loaded onto trucks and shipped to the nearest railhead at Molson, Manitoba, for transfer to railcars and shipment to a smelter, or it may be trucked to Winnipeg, Manitoba for the loading onto railcars. The rail distance from Winnipeg, Manitoba to Sudbury, Ontario is approximately 1,500 km.

The scavenger flotation concentrate and the tailings from the cleaner circuit will be sent to a regrind mill with the product sent to a scavenger cleaning circuit. The concentrate from this circuit will be returned to the head of the rougher flotation circuit for further processing.

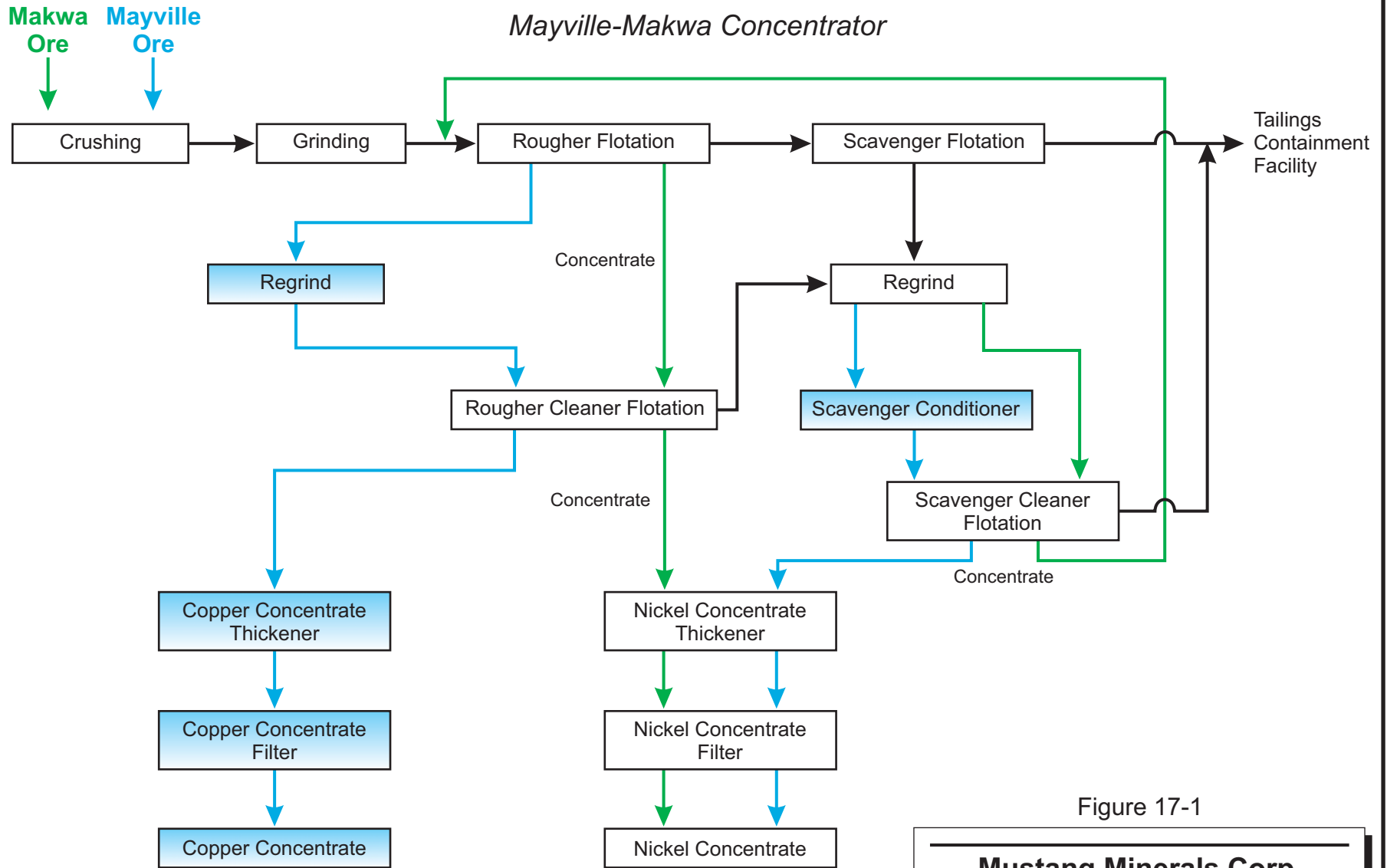
The tails from the rougher/scavenger, cleaner circuit, and the scavenger cleaner circuit will be combined, sent to a tailings thickener, in order to reclaim process water. The thickener underflow will be pumped to the TMF.

Reclaimed process water will be returned to the head of the grinding circuit for re-use. Water from the TMF will also be returned to the concentrator for re-use.

## **MAYVILLE (PHASE 2)**

The crushing and grinding circuit will essentially be the same as Makwa (Phase 1). Modifications required for Mayville (Phase 2) will consist mainly of the addition of a regrind mill to process the rougher concentrate, a scavenger cleaner conditioning tank and additional cleaner flotation cells to process the copper concentrate. The copper concentrate will be thickened, filtered, and stored in a new concentrate storage area, loaded onto trucks and shipped to the railhead.

### Mayville-Makwa Concentrator



17-3

**Legend:**

- ➔ Phase 1 Makwa Process
- ➔ Phase 2 Mayville Process
- ➔ Phase 1 & 2 Process
- Phase 2 New Equipment

Figure 17-1

**Mustang Minerals Corp.**

**Mayville-Makwa Project**

Southern Manitoba, Canada

**Combined Makwa-Mayville Process Flow Sheet**



## 18 PROJECT INFRASTRUCTURE

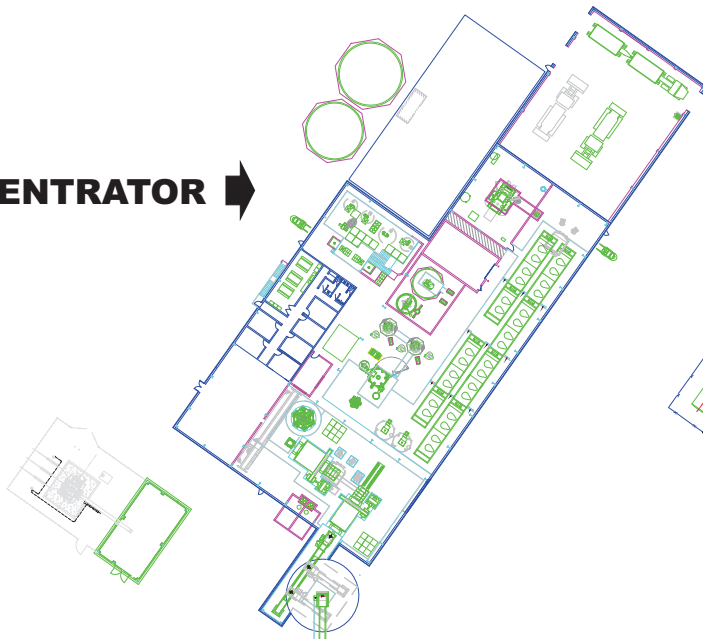
The initial design for the Project infrastructure and related cost estimates were prepared by Met-Chem in 2008, which assumed that the original processing facility would be located on the Makwa property. The new approach for processing the Makwa and Mayville mineralized material adopted in this PEA will be for the process plant, administration offices, and most of the other major infrastructure to be located on the Mayville property. Makwa mineralized material will be trucked by highway trucks to the Mayville processing plant a distance of approximately 43 km.

While the location has been moved to Mayville, process plant layouts used in this PEA are unchanged from the 2008 Met-Chem report (Figure 18-1).

**CONCENTRATOR** →



Propane Tank



**PRIMARY CRUSHER** →



*No Scale*

Figure 18-1

**Mustang Minerals Corp.**

**Mayville-Makwa Project**

*Southern Manitoba, Canada*

**Surface Facilities**

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## MAKWA SITE INFRASTRUCTURE

The infrastructure proposed at Makwa mainly includes access and site roads and mine surface facilities.

### MAKWA ACCESS ROAD TO SITE

Access by road to the site will be from the south via a secondary road branching north from Highway 314 approximately 140 km northeast of Winnipeg, Manitoba. An existing road leading to the Tanco mine connects to Highway 314 from the east and allows access to the property. This existing road is considered suitable for site access without upgrading. A new 10 m wide road branching north to the Makwa Project site will be constructed over 0.8 km to the property gate location.

Vulcan software was used to select the most economical route and estimate cut and fill quantities. Rock cut quantities were kept to a minimum respecting 8% slope maximum.

The property gate is located north of the processing plant/office area, 0.8 km north of the branch to the main site facilities. It consists of an operated gate with controls located in the gatehouse consisting of a 3.65 m by 6 m ATCO-type trailer.

### MAKWA SITE ROADS

A small 24 m long, 8 m wide road will be built on the opposite side of the Tanco mine road, an existing road adjacent to the property that leads to the Tanco mine, and will be used to access the fresh water pumping station. Site roads will be constructed to access the load out run of mine (ROM) pad near the open pit, the mine explosive storage (0.7 km), and the bulk explosives plant (0.1 km) and will generally be eight metres wide. The mine dewatering line road is included in the mine development area.

The employee parking area is located outside of the gate on the west side of the main access road and has a capacity of approximately 25 vehicles. Roads will be constructed of local borrow material and/or mine waste rock, as appropriate.

### MINE SURFACE FACILITIES

Other infrastructure includes

- Mining Office;
- Temporary Truck Shop and Warehouse (15 m x 25 m);
- Offices/Shop/Warehouse;
- Staging Area;
- Mine Explosive Storage;
- Site Perimeter Fencing;
- Explosives Area Fencing;
- Fuel Storage and Distribution;
- Potable Water Treatment; and
- Water Tank.

## **MAYVILLE SITE INFRASTRUCTURE**

The following infrastructure is proposed at Mayville:

- Access Road;
- Construction Laydown Area(s);
- Process Plant, TMF;
- Office Complex and Laboratory;
- Mine Equipment Maintenance;
- Warehouse;
- Site Perimeter Fencing;
- Truck Scale;
- Water Systems;
- Heating, Ventilation, Conditioning;
- Potable Water Treatment;
- Fuel Storage;
- Waste Water System;
- Garbage Disposal;
- Power Supply;
- Mine Explosive Storage; and
- Bulk Blasting Agent Storage.

## **MAYVILLE ACCESS ROAD TO SITE**

The plant gate is located south of the processing plant/office area and north of the branch to the main site facilities. It consists of an operated gate with controls located in the gatehouse consisting of a 3.65 m by 6 m ATCO type trailer.

## **MAYVILLE CONSTRUCTION LAYDOWN AREA**

A 3,000 m<sup>2</sup> area located to the west of the office complex will be cleared, grubbed, and leveled to serve as a laydown area during construction and cold storage during operation. It will be constructed from mine waste covered by 150 mm of pit run material.

## **MAYVILLE PROCESSING PLANT BUILDING**

A conventional building for this use will be constructed of structural steel and siding on a concrete foundation. The dimensions are 42 m by 122 m. The concentrator building houses the grinding, flotation, reagent and filtration areas, the compressors as well as tailings pumps and pump boxes. The electrical rooms (two floors of 12 m by 18 m) are located at the southeast corner. The concentrate load out is located at the west end of the building.

Mechanical and electrical maintenance shops are located next to the reagent area on the east side of the load out and on the south side of the concentrator building. Offices, conference room, lunchroom, washrooms, and a dry are provided for on the second floor of the maintenance shops. The building will be heated via propane air make-up units.

The TMF will be located immediately to the southeast of the plant and have capacity of 40 Mt to 60 Mt.

## **MAYVILLE OFFICE COMPLEX AND LABORATORY**

The office complex is composed of 15 ATCO type trailers assembled in modules. Each trailer has dimensions of 3.65 m by 18.3 m (12 ft x 60 ft). The complex has four modules, one each for the mining group, change house, administration, and laboratory facilities.

Two simple structures are added to the laboratory building, for the electrical room, and to house the precision scale.

The complex is installed on wooden supports called cages, approximately 1.2 m above ground. Each building/module is installed with skirting. Each building/module has connecting heated corridors except for the laboratory, which is isolated.

## **MAYVILLE MINE EQUIPMENT MAINTENANCE BUILDING**

The mine equipment maintenance building is a standard structural steel, siding and concrete foundation building normally constructed for similar sites. The building includes a wash bay, three major equipment maintenance bays, the warehouse, and offices.

The wash bay is equipped with a pressure washing system. The maintenance bays are equipped with a 15 t overhead crane and a dedicated air compressor. Each bay has an area

of 195 m<sup>2</sup>. An oil/water separator is included. The mine equipment maintenance building is designed for the Caterpillar 785D model trucks. It is also planned to service a Caterpillar 992G High Lift wheel loader as well as smaller equipment in the facilities.

The building will be heated via a propane air make-up unit. The unit will also be used during the summer months to provide air changes in the building.

The plant mobile equipment included in the estimate is listed in Table 18-1.

**TABLE 18-1 PLANT MOBILE EQUIPMENT  
Mustang Minerals Corp. – Makwa-Mayville Project**

Description	Quantity
Management vehicle standard Ford/Chevrolet	1
Single cab pick-up, V-t (concentrator)	2
Single cab pick-up, V-t (administration)	2
Wheel loader Cat 988H, 6.4 m <sup>3</sup>	1
Bob cat 1.5 m <sup>3</sup> mini loader	1
2.5 t electric fork lift	2
Ambulance, F-450 4WD	1
Fire truck	1
Service truck, 22,000 kg	1
Fork lift truck, 10 t diesel	1

### **MAYVILLE WAREHOUSE**

The warehouse is an integral part of the mine equipment maintenance building, separated from the maintenance bays by a concrete block wall. The surface area is 312 m<sup>2</sup>. The warehouse floor is elevated 1.2 m above the surrounding ground elevation, to suit the elevation of the loading dock and to eliminate potential water and ice problems.

### **MAYVILLE SITE FENCING**

Site fencing is restricted to the main gate, the main substation, the propane storage tank, and explosive storage areas.

### **MAYVILLE TRUCK SCALE**

A truck scale is located inside the load-out bays of the processing plant. It is designed to weigh the concentrate trucks (A, B, or C train type with a total length of 23 m maximum) and any other delivery trucks, if required. The type selected has a capacity of 100 t.

## **WATER SYSTEMS**

The water systems include the fresh water intake system, the plant collection pond system, and the reclaim water system. The fresh water intake system provides fresh water to the plant for water makeup and for site fire protection. The fresh water intake is from Bird River at the south end of the mill access road. The fresh water pump house includes two standard vertical turbine pumps (one on stand-by) placed in a pipe well. The piping is 250 mm diameter insulated and traced high density polyethylene (HDPE) pipe running to the mill building for a distance of 900 m.

The fresh water tank near the concentrator building has a total capacity of 1,113 m<sup>3</sup>. The minimum capacity dedicated to fire protection is 625 m<sup>3</sup>.

A collection pond is located southeast of the processing plant building. It is designed to collect all surface drainage water coming from plant facilities. The plant collection pond system is mainly a pump house, pumps and piping system to pump water back to the mill tailings pump box.

An allowance has been included in the cost estimate for the mine dewatering system.

## **MAYVILLE HEATING, VENTILATION, AND AIR CONDITIONING**

Exhaust fans are installed for each building to insure proper air change and temperature control in the summer. The major buildings and facilities are heated by propane direct fired units.

The secondary installations are heated by electrical baseboard heaters, namely the laboratory, the change house, and the mine and the administration offices. The offices in the processing plant and maintenance building are also heated with baseboard heaters and have air conditioning.

## **MAYVILLE POTABLE WATER TREATMENT**

The potable water treatment system is provided by a Chamco water treatment all-inclusive package. The potable water treatment system fits in a standard 2.4 m by 6.1 m container. The package reduces the site work needed for installation and provides the required water treatment equipment to conform to Manitoba regulations.

The container is installed outside the processing plant building adjacent to the loadout and reagent area. The potable water is stored in tank beside the treatment container. The water is then distributed via pumps to the different buildings.

### **FUEL STORAGE AND FUELLING STATION**

The fuel storage area is located east of the plant facilities on the south side of the site access road. It is constructed with pit run waste material. The fuel storage will consist of two, horizontal (15,000 gallon) aboveground storage tanks. They will be arranged in tandem and will come complete with refuelling pump, tank monitoring package, and control system.

Due to the double wall system, spill protection is not required and the tanks can be mounted on a simple concrete base. Bollards will be provided to prevent mobile equipment movement near the tanks.

### **SANITARY WASTE WATER**

The sanitary waste water system comprises an underground piping and manhole system. The system discharges in a concrete septic tank located southwest of the office and administration complexes. The septic tank, after the proper retention time, discharges to a leaching bed made of perforated pipes. The septic tank and leaching bed design is based on the Workplace Safety and Health Act (C. C. S. M c. W210) - Operation of Mines Regulation.

### **GARBAGE DISPOSAL**

Garbage disposal will be handled by a local contractor, and no on-site disposal is planned.

### **MINE EXPLOSIVE STORAGE**

Cartridge explosives to be used for pre-shearing and secondary blasting will be stored in a magazine provided by the explosive supplier. The magazine for detonators, also to be provided by the supplier, will be located nearby. The location of the magazine approximately 500 m to the north of the tailings pond access road is based on a maximum quantity of 30,000 kg as per the requirements of NRC Canada explosive quantities/distances regulations.



The explosive magazine area will be enclosed by a fence with a locked gate allowing access to the area by authorized employees only. A 625 m<sup>2</sup> fenced and diked area will be provided to house the explosive storage magazine.

### **BULK EXPLOSIVE PLANT**

The bulk explosive supplier will erect a bulk explosive mixing plant on the Makwa Property. The required services (power, water, septic installation) will be provided via a generator and well in vicinity of the plant.

A 100 m by 100 m cleared, grubbed and level pad will be provided for the installation of the bulk explosives plant.

### **ELECTRICAL POWER SUPPLY AND DISTRIBUTION**

The plant will be fed by a 66 kV overhead electrical power line supplied and installed by Manitoba Hydro Electrical Utility Company at a distance of 10.0 km from the Line 77, which is fed by the Great Falls hydro plant and substation, located approximately 30 km southwest of Mayville. Mustang contacted Manitoba Hydro to request a preliminary load interconnection study with cost estimate for a maximum of 7 MW of electrical load for the concentrator, the mine and the utility equipment and service buildings.

The Manitoba Hydro power line will feed the mine complex via a main transformer, located at the main plant substation near the processing plant building.

A 1 MW emergency diesel generator will be located near the main substation and will feed the plant essential load motor control centre and the pole line through the main 4.16 kV switchgear.

# 19 MARKET STUDIES AND CONTRACTS

## MARKETS

Potential customers for a combined nickel and copper concentrate include all global nickel smelters, however, due to transportation costs and treatment terms, the most likely customers of Mustang's nickel and copper concentrates are summarized in Table 19-1.

**TABLE 19-1 POTENTIAL SMELTERS CUSTOMERS  
Mustang Minerals Corp. – Makwa-Mayville Project**

Smelter Name	Company	Location	Products	Distance From Winnipeg Concentrator (km)
Horne	Xstrata plc	Rouyn-Noranda, QC	Cu	1,648
Sudbury Division	Xstrata plc	Falconbridge, ON	Ni, Cu	1,519
Copper Cliff	Vale Inco Ltd	Sudbury, ON	Cu, Ni, Co	1,519
Cobalt Refining Co. (CRC)	Sherritt International Corp.	Fort Saskatchewan, AB	Ni, Co	1,297

Xstrata is a competitive buyer of concentrate, which they treat in Canada into matte for refining in Kristiansand in Norway.

All of the above buyers produce class 1 nickel products and can afford to treat concentrates because of their high quality end products, and as a result can remain competitive for concentrate supplies.

## NICKEL AND COPPER CONCENTRATE MARKETS

The major market for nickel metal is in the production of stainless steel, which consumes approximately 65% of primary nickel production. About 40% of the nickel used for production of stainless steel is in the form of scrap stainless steel. Scrap steel is usually an alloy to the product's requirements and it is preferred by steel makers. China is the largest producer of stainless steel in the world, and it consumes about 40% of primary nickel production.

The major end uses of nickel, all of which require class 1 nickel feed, are in the production of:

- 46% for making nickel steels;

- 34% in nonferrous alloys and superalloys;
- 14% electroplating; and
- 6% into other uses.

Stainless steel uses a variety of sources to provide nickel. These sources include:

- Scrap stainless steel;
- Nickel oxide;
- Utility nickel pig;
- Ferro nickel (probably the largest source other than scrap.); and
- Nickel Pig Iron.

While sulphide ores are generally converted to class 1 nickel some laterite sources can also be used to provide class 1 products. Ferro nickel and nickel pig iron are entirely produced from laterite sources. The latter is low grade product developed by the Chinese using Indonesian and Philippine ores to help cover a shortage of nickel supply and to lower the cost of nickel units in final consumer products. Nickel pig iron in particular lowers costs as it is directly smelted from laterite ore, also contains iron, chrome and even manganese. Chrome is the essential element of stainless steel and the 200 series are a low nickel, but high manganese steel. In this application, manganese replaces some of the nickel as it is also an Austenite.

The major stainless steel alloy is the 300 series. This contains over 8% nickel and the standard 20% chrome, and is the better quality product than 200 series, which has a decreasing nickel content and increasing manganese resulting in weak corrosion resistance. Usually scrap is the base, to which is added ferrochrome, ferronickel and the alloy is balanced using class 1 nickel. When nickel pig iron was introduced by the Chinese this changed the production techniques and provided a lower cost route to 200 series stainless in particular.

Nickel pig iron is now considered to have a market of its own. There is an established market in China for ores and nickel pig iron, which is produced by small low tech electric furnace operators. Factors such as internal freight costs, power restrictions, and pollution have become important controls on the availability of this nickel replacement. It is generally agreed that the cost of producing nickel pig iron requires a nickel price of at least \$15,000 per tonne to be viable; however, with the increasing value of the Yuan and the rise in electricity prices in China this is likely to increase. If nickel pig iron production was to cease for any reason the price of nickel could rise dramatically again.

Ferro nickel, which is essentially a high grade or refined nickel pig iron, is likely to be the biggest increase in supply to the nickel market over the next few years.

Overall, stainless steel will still dominate nickel demand. The growth in China continues and the nickel tenor is starting to increase in stainless steel as there is a return to higher quality products, which will increase nickel demand. For example an increase in the nickel tenor from the present average of 7% back to 8% would result in an increase in nickel demand of 300,000 tpa, which is more than enough to consume the new supplies of ferronickel.

It can be seen there are any number of variables, which will affect the supply and demand for nickel any one of which can change the supply-demand balance and hence the price.

Forecast nickel prices depend on the recovery of the world's economies. Demand for nickel will be highly dependent on China as well as the growth experienced in India. Development in Brazil and Russia will also be an important element in nickel demand as both are major nickel producers.

Copper markets are mature global markets with reputable smelters and refiners located throughout the world. Copper is a principal metal traded on the London Metal Exchange (LME) and has total price transparency. Prices are quoted on the LME for Copper Grade A and can be found at [www.lme.com](http://www.lme.com).

Table 19-2 summarizes the historical prices of copper, nickel, palladium, platinum, and cobalt over the past three and a half years.

**TABLE 19-2 HISTORICAL NICKEL, COPPER, PALLADIUM, PLATINUM AND COBALT PRICES**

**Mustang Minerals Corp. – Makwa-Mayville Project**

Year	Copper Price, US\$/lb	Nickel Price, US\$/lb	Palladium Price, US\$/oz	Platinum Price, US\$/oz	Cobalt Price, US\$/lb
2010	3.42	9.89	525.51	1,608.98	20.93
2011	3.99	10.35	733.30	1,721.86	17.75
2012	3.61	7.98	643.53	1,551.48	14.36
Jan-Aug 2013	3.36	7.08	727.11	1,523.96	13.52
<b>Average 2010 – Aug 2013</b>	<b>3.60</b>	<b>8.83</b>	<b>657.36</b>	<b>1,601.57</b>	<b>16.64</b>

Sources: [www.kitco.com](http://www.kitco.com) , London PM Fix prices; [www.LME.co.uk](http://www.LME.co.uk) , [www.metalprices.com](http://www.metalprices.com)

## METAL PRICING

Based on consensus metal price forecasts from banks and financial institutions, RPA recommends the following range of prices, which are dependent on any given year:

- Nickel: US\$7.00/lb - US\$9.00/lb – Long Term at US\$8.50/lb;
- Copper: US\$3.25/lb - US\$3.50/lb – Long Term at US\$3.40/lb
- Cobalt: US\$13.50/lb - US\$14.50/lb – Long Term at US\$14.00/lb
- Platinum: US\$1,750/oz - US\$1,800/oz – Long Term at US\$1,800/oz
- Palladium: US\$750/oz - US\$850/oz – Long Term at US\$800/oz

The principal commodities to be produced at the Makwa-Mayville project are concentrates of copper and nickel with varying amounts of palladium, platinum, and cobalt; which are traded, at known prices, so that prospects for sale of any production are virtually assured. For the Base Case cash flow scenario in the PEA economic analysis; RPA used the following prices:

- Copper at US\$3.40/lb;
- Nickel at US\$8.50/lb;
- Palladium at US\$800/oz;
- Platinum at US\$1,800/oz; and
- Cobalt at a price of US\$14/lb.

Operations at Makwa and Mayville are expected to produce a nominal 3,600 tonnes of nickel, 8,700 tonnes of copper, 13 tonnes of cobalt, 481 ounces of platinum and 9,300 ounces of palladium, annually, over an estimated project life of 14 years. The mine life for the Makwa deposit is estimated to be four years and the Mayville mine life is estimated to eight years.

It was assumed that Mustang will not rely on the sale of its platinum and palladium to any particular buyer. Mustang's platinum and palladium should be refined to market delivery standards at the smelter, which could be accepted by any reputable commercial refinery.

## INDICATIVE CONCENTRATE TERMS

As a reference, RPA was provided a series of indicative terms for concentrates from Mustang. Unlike concentrate markets such as copper, zinc, and lead, which are relatively standardized, nickel treatment terms vary considerably between smelters. Some smelters, for example, pay a higher percentage for payable metals such as nickel, copper, cobalt, and

platinum group metals and then deduct a variety of treatment and refining charges to arrive at a CIF (cost, insurance, and freight) price per dry metric tonne (DMT).

In addition to the base treatment charges, there are a variety of price participation mechanisms, which allow the smelter to increase treatment charges as metal prices increase. Other smelters pay a lower percentage for payable metals, but with no treatment charges. Smelters can also charge penalties for elements deleterious to the smelting process; such as magnesium oxide or arsenic, but these do not appear to be an issue on the basis of the concentrate assays from preliminary test work. Further test work may be required to confirm this.

Contractual terms and treatment charge formulas are commercially confidential information, which may not be released without express permission.

RPA selected payment terms and charges that are typical for the current market, and applied them to the Project. For the PEA economic analysis, RPA used the smelting and refining costs shown in Table 19-3.

**TABLE 19-3 SMELTING AND REFINING COSTS**  
**Mustang Minerals Corp. – Makwa-Mayville Project**

<b>Description of Charges</b>	<b>Units</b>	<b>Values</b>
<b>Charges Nickel Con</b>		
Smelting	US\$/t Con	366.00
Refining - Nickel	US\$/lb	0.70
Refining - Copper	US\$/lb	0.50
Refining - Cobalt	US\$/lb	2.75
Refining - Platinum	US\$/oz	15.00
Refining - Palladium	US\$/oz	15.00
Refining - Silver	US\$/oz	-
Refining - Gold	US\$/oz	5.00
Exchange	US\$:C\$	0.94
<b>Charges Copper Con</b>		
Smelting	US\$/t Con	85.00
Refining - Nickel	US\$/lb	0.70
Refining - Copper	US\$/lb	0.09
Refining - Platinum	US\$/oz	15.00
Refining - Palladium	US\$/oz	15.00
Refining - Silver	US\$/oz	-

Description of Charges	Units	Values
Refining - Gold	US\$/oz	5.00
Exchange	US\$:C\$	0.94

These terms should be considered indicative for scoping study purposes only. Actual terms achieved will depend on market conditions at the time that the off take agreement is negotiated. The indicative terms shown are on a CIF basis meaning the Seller is responsible for arranging and paying for sea freight to transport the concentrates to the smelter's discharge port.

## CONCENTRATE TRANSPORT AND LOGISTICS

A cost model was developed for the transport and logistics from the mine gate to potential customers near Sudbury, Ontario by a local transportation firm for Mustang. Cost inputs are summarized in Table 19-4.

**TABLE 19-4 ESTIMATED CONCENTRATE TRANSPORT AND LOGISTICS COSTS  
Mustang Minerals Corp. – Makwa-Mayville Project**

Aspect	Cost (C\$/wmt)
Road Transport from Mayville Concentrator to Winnipeg, MB Railhead	19.00
Rail Trans loading	2.00
Rail Charge with Fuel Surcharge	68.00
Weighing, Sampling and Assaying at Discharge Point – Sudbury, ON	3.00
Insurance	2.00
<b>Estimated Total</b>	<b>94.00</b>

These costs are based on the following logistics approach:

- Packaging of concentrate into either lined containers or bags packed in containers on site.
- Transport from Mayville plant site to Winnipeg, Manitoba one trip per day (round trip approximately 270 km), 12 to 15 dedicated truck-trailers of 40-tonne capacity, working 26 days per month, including workshops at mine, satellite tracking systems on trucks, central monitoring, break-down facilities, fleet amortization, replacement provisions, spares, repairs and other fleet costs.
- Lift off/on, stacking and staging of containers at the smelter rail yard.
- Rail costs, surcharges, profit carried out by a dedicated shipping agent.

## **CONTRACTS**

No contracts have been established for Mustang's Makwa-Mayville Project.

Contracts will be put in place for concentrate treatment and refining.



## **20 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT**

It has been estimated that the time frame to complete the necessary environmental assessments and permits for the Mayville and Makwa sites is approximately two years.

The Dumbarton and Maskwa mines operated from 1969 to 1976. There was no mill on site and the ore was trucked to Gordon Lake, Ontario, for milling. RPA is unclear as to the causes of the closure of the two mines.

In 1976, 1988, 1994 and 1995, safety and reclamation concerns at the Makwa property were addressed, and Canmine completed a significant amount of environmental work on the property from 1996-1998 (Evans, 2005).

There is approximately 5,000 tonnes to 10,000 tonnes of cobalt-copper mineralization of an unknown grade stockpiled on the Makwa property near the main gate.

The Mayville property has never been mined. An environmental scoping study was completed by Wardrop in 2010 (Wardrop was purchased by Tetra Tech in 2009).

### **MAKWA**

#### **ENVIRONMENTAL STUDIES**

Environment, socio-economic conditions, and permitting baseline studies were completed by Wardrop (Purchased by Tetra Tech in 2009) in 2009 and they are briefly described below.

The Makwa Property is located in the southwest portion of Nopiming Provincial Park, a multiple-use park that was established by the government of Manitoba in 1976. Resource development and recreational activities take place within the southern part of the park. There are four cottage developments at the south end of Nopiming Park that are accessed by PR 315, which runs east-west through the park. There are also two campgrounds and one lodge at the southern end of the park. The Bird River is one of the four main canoe routes within the park. Other resource uses include trapping and harvesting of wild rice.

Nopiming Park accommodates commercial resource uses such as forestry and mining. The area was opened up with the development of mining, forestry and hydro-electric projects prior to establishment of the park and transportation systems in the area were developed with exploration and mining. Mineral exploration and mining at the Makwa site had started with claim staking in 1920, and the property has been staked or leased by various prospectors and companies since then.

The contemporary regional economy is diverse and is based on agriculture, mining, forestry, tourism, and hydro-electricity generation. Tembec's Forest Management Licence 01 used to encompass Nopiming Park, but forestry is no longer permitted in provincial parks and Tembec no longer exists as a company. The Tantalum Mining Corporation (Tantalum) operates a tantalum mine at Bernic Lake, on Crown land south of the park. Municipalities in the vicinity of the park include the Rural Municipality of Alexander, the Rural Municipality of Lac du Bonnet, the Town of Lac du Bonnet and the Local Government District of Pinawa.

The Rural Municipality of Alexander lies west of the Makwa Property and has a population of 2,978 located primarily in many small communities (Statistics Canada 2006 census). The population increases considerably during the summer as there are a number of cottage developments within the Municipality. There is a mix of permanent and summer residents in the subdivisions along the Bird River adjacent to PR 315 southwest of Nopiming Park, although the majority are summer residents. Forestry, hydropower, agriculture, and tourism are the principal economic activities in the regional area; however, logging is no longer permitted in provincial parks. The Town of Powerview-Pine Falls is a major community in the region with a population of 1,294 (Statistics Canada 2006 census). The paper plant of Tembec is located in Powerview-Pine Falls.

The Rural Municipality of Lac du Bonnet lies southwest of the Makwa Project area and has a population of 2,812, while the Town of Lac du Bonnet has a population of 1,009 (Statistics Canada 2006 census). Lac du Bonnet is a retail and service centre. The population of the Municipality increases considerably in the summer due to cottage subdivisions. The local economy is based on agriculture. The mining, forestry, and tourism sectors are also major employers.

The Local Government District of Pinawa lies southwest of the Makwa Project area and has a population of 1,450 (Statistics Canada 2006 census). Atomic Energy of Canada's

Whiteshell Laboratories' decommissioning project provides local employment. Other economic activities include knowledge-based companies, health care, and education services. The regional office of Mustang is located in Pinawa.

Sagkeeng First Nation (Fort Alexander), adjacent to Powerview-Pine Falls on the Winnipeg River, at the outlet to Lake Winnipeg, has a total registered population of 6,785, with 3,157 residing on-reserve (INAC 2008). In 2007, Sagkeeng First Nation advanced a claim of unextinguished aboriginal title with the Manitoba Court of Queen's Bench, covering an extensive area from Fort Alexander east to the Ontario border.

Mustang has initiated a public engagement program with the assistance of Wardrop (Purchased by Tetra Tech in 2009) for the Makwa property.

## **ENVIRONMENTAL BASELINE STUDIES**

Mustang commissioned Wardrop to conduct baseline aquatic and terrestrial environmental studies, to prepare an Environment Act Licence proposal and EIS for the Makwa property. Baseline studies were initiated in September 2006 and field work was completed in December 2007. Full details on the baseline environmental condition and the potential environmental impact of the project will be detailed in the EIS and Environment Act Licence proposal that are currently in preparation; however, the Mayville property will now be the location of the process facilities (crusher, concentrator, tailings management facilities) for the concentration of the Makwa and Mayville copper and nickel mineralized material. No processing is planned to be done on the Makwa project site. The only major activity will be the open pit mining of the Makwa mineralized material and transportation offsite to Mustang's Mayville property and processing facility.

The Project is proposed for development on the site of the former Maskwa open pit and Dumbarton underground mines. Operations at Maskwa and Dumbarton were limited to mining since ore was trucked offsite for milling. There was no mill constructed on site and no tailings were deposited at the Maskwa property. The principle decommissioning activities were conducted in 1976, with additional work carried out in 1988, 1994, and 1995. No structures were left on site and the portal and raises were plugged with rock or capped with reinforced concrete covers. In 1997, Canmine commissioned a site assessment, including soil contamination and surface water and groundwater studies. It was concluded that no remedial actions were required. Aquatic studies were conducted in 1998 with the objective

of providing baseline data for an EIS for a proposed plant; and Mustang now plans to build its processing facilities at its Mayville property located approximately 43 km (road distance) from the Makwa property.

#### **MAKWA GROUNDWATER**

Canmine commissioned a groundwater study focused on the Dumbarton underground mine workings in 1997. Well water quality results were typical for the geology of that area of the province.

Four existing wells were identified around the Makwa pit during the current environmental program. A field study was conducted to assess the condition of the wells, determine well construction and depth, collect water samples, and measure hydraulic conductivity. The results will be presented in the EIS.

#### **MAKWA SURFACE WATER**

##### **Hydrology**

The processing plant will be placed at the Mayville property. Water requirements from Makwa will only be dust control and sewage waste disposal. The make-up water can be taken from the Bird River. A water intake would be installed on the north bank of the river where the site access road joins the Tanco road. The water intake would follow the Fisheries and Oceans, Canada (DFO) Freshwater Intake End-of-Pipe Fish Screen Guideline. Environment Canada maintains a hydrometric station on the Bird River immediately upstream of the Makwa Property and, therefore, an extensive 40 year hydrometric record exists for the Bird River. An analysis of river flow indicates that make-up water requirements will be a maximum 6.3% of the lowest mean monthly flow (December), and 7.5% of the lowest recorded flow. This is well below the DFO recommendation that water withdrawals not exceed 10% of stream flow.

Mine water and waste rock runoff will be directed to a settling pond and then discharged into West Creek, a tributary of Bird River.

#### **MAKWA WATER QUALITY**

Baseline water quality survey sites were established at upstream and downstream locations on the Bird River, and F-Zone, Pumphouse, Waste Rock, West and Mill creeks. Water quality of the Bird River and the tributaries is typical for the geology and region. Higher

nickel concentrations were observed in puddles adjacent to the existing waste rock pile than observed in stream samples. This has been attributed to the presence of unprocessed mineralized material in the waste rock pile. However, nickel concentrations were within the Manitoba Surface Water Quality Standards. Surface water quality results will be presented in the EIS.

#### **MAKWA FISH AND FISH HABITAT**

The Bird River system supports a diverse fish community that includes northern pike (*Esox lucius*), walleye (*Sander vitreus*), yellow perch (*Perca flavescens*), white sucker (*Catostomus commersoni*), and forage species. Three small tributaries: Waste Rock, West, and Mill creeks, drain the project area south into the Bird River. The existing Makwa pit, without prior design or assistance, supports a community of Arctic char (*Salvelinus alpinus*) and northern redbelly dace (*Phoxinus eos*; a forage species). The Manitoba government has no records of char being stocked in the pit. As such, the Manitoba government has no regulatory interest in the char population. The Bird River and the tributaries were sampled for sediment, benthic invertebrates, and fish community, and a fish community survey was conducted in the Makwa pit. The results will be presented in the EIS.

The quality of the receiving aquatic environment must be maintained to support the continued use by fish species in the Bird River adjacent to the project site and in the tributaries. As well, any development activities that will result in the loss of fish habitat will require a Fisheries Act Section 35(2) authorization from DFO. An authorization will require habitat compensation for any losses.

There is evidence of the previous mining activities at the Makwa Project site. Waste Rock Creek remains impacted from the prior development. Overburden and waste rock storage to the south of the existing pit blocked the historical discharge of Waste Rock Creek into West Creek. As a result, a shallow pond has formed east of the pit and currently discharges directly into the Bird River.

Potential effects on fish habitat include the mine road crossings of the Bird River tributaries and the Bird River water intake. Though these are common development activities, the works may require an authorization from DFO. The development of the pit will require the diversion of West Creek around the west perimeter of the pit. This will require an authorization from DFO. However, the diversion channel should provide the required

compensation for any habitat losses in West Creek. At closure, the pit will be returned to a fish habitat.

No sensitive fish species are known to occur in the Bird River or the tributaries at the Project site. The carmine shiner (*Notropis percobromus*), observed in the Bird River 18 km downstream of the Project site, is listed as threatened under the Species at Risk Act, but is not listed under the Manitoba Endangered Species Act. Recent DFO surveys to determine the distribution of shiner in the Bird River did not recover any of the fish in sampling sites adjacent to or upstream of the project area and did not expand the previously known distribution of these shiners in the Bird River. No critical habitat was observed in the Bird River tributaries draining the Project area.

#### **MAKWA WILDLIFE AND HABITAT**

An extensive database exists of wildlife and habitat information compiled for a model forest study in nearby areas of Nopiming Park. Therefore, wildlife and habitat surveys conducted at the Project site were focused on the proposed development areas. Wildlife surveys included amphibians, reptiles, mammals, and birds. No threatened or endangered species were found to use the area for breeding. As well, there is no known critical habitat for protected species within the development footprint. Vegetation surveys did not identify any threatened or endangered plant species within the development footprint. The results will be presented in the EIS.

#### **MAKWA HERITAGE RESOURCES**

An archaeological site survey was conducted around the proposed pit, waste rock piles, mill site, and tailings management area. A single, minor site was identified between the proposed waste rock piles. Following standard Province of Manitoba heritage resource procedures, the artifacts were recorded, recovered, examined, and entered into storage. The archaeologists concluded that there were no heritage resource management concerns with the Makwa project site.

#### **MAKWA GEOCHEMISTRY**

A program to characterize the waste rock and tailings material is ongoing. Core samples were selected to be representative of the various waste rock types to be produced from the pit. The existing waste rock pile was also sampled so as to provide a real world model for

waste rock weathering. Tailings samples were received from bench-scale metallurgical test work representative of the milling process proposed for the Makwa mineralization.

Although geochemical characterization test work is ongoing, preliminary results indicate that waste rock will not be acid-generating.

#### **MAKWA WASTE ROCK**

Sixty-seven core samples (including one duplicate) were selected through review of geological sections and borehole logs to be representative of the various waste rock types to be produced from the pit, both near the mineralized zones and further away. Some of the samples likely represent low-grade mineralization, depending on how the cut-off grade is eventually defined. Static tests conducted include acid/base accounting (ABA), ICP-MS for acid metals, and whole rock analysis. The neutralizing potential (NP) in the metavolcanic footwall rock is much lower than in the rest of the core sampled, and the acid generation potential (AP) is typically low. The level of sulphides in these samples is low to nil; therefore the potential for acid rock drainage (ARD) is low. Overall, while some of the samples were classified as uncertain with respect to ARD potential using the standard classification systems, very few samples were of concern in terms of ARD and the large inventory of NP material would be of benefit in neutralizing any acid that may develop locally.

Twenty-six rock samples were collected during a field investigation to assess conditions in the existing mineralized waste rock pile. The existing waste rock pile can be viewed as a large column test that has been running since 1976, and the weathered waste rock piles can provide information superior to laboratory kinetic test work. Material in the waste rock pile is highly mineralized so that the nickel and sulphide levels, for example, are much higher in the mineralized rock dump samples than in most of the core samples. Results from the waste rock pile provide an indication of the upper limit for water quality resulting from contact with waste rock. Therefore, during operations water running off the waste rock will be directed to a settling pond and, upon achieving regulatory objectives, discharged into West Creek.

More information on metal leaching will be derived from the humidity cell tests, which are planned to be re-started at the time of writing this report.

## **MAKWA PROJECT PERMITTING**

Environmental licensing for the Makwa mine will be handled through the "one-window" process managed by Manitoba Conservation. The project will require a Manitoba Environment Act Licence, issued by Manitoba Conservation, prior to the start of construction. The project will be a Class 2 development under the Act, requiring a full environmental impact statement (EIS) to be submitted along with the license application.

### ***PROVINCIAL PERMITTING***

The Environment Act Licence is the primary enabling approval that is required before the project can be constructed. Several other administrative approvals also may be required, including:

- Water Rights Licence - for any groundwater withdrawals, including pumping of mine water (Manitoba Regulation 126/87).
- Onsite Wastewater System Permit - for the installation and operation of any onsite sanitary wastewater system (Manitoba Regulation 83/2003).
- Petroleum Storage Tanks - permits are required for both the construction/installation and operation of petroleum storage tanks with a capacity of 5,000 L or more (Manitoba Regulation 188/2001).
- Mustang Minerals must also register as a Hazardous Waste Generator under Manitoba Regulation 175/87.

The Manitoba Parks Branch considers mining an acceptable use of resources in the area of Nopiming Provincial Park that is occupied by the Makwa Property. However, the Parks Branch considers mining only to include the extraction of ore and not ore processing and tailings containment. Therefore, the processing plant site and tailings management area have been located on the Mayville property, which is approximately 43 km from the Makwa property by road, but lays approximately seven kilometres outside of the Nopiming Park boundary.

### ***FEDERAL PERMITTING***

A Fisheries Act Section 35(2) Authorization will likely be required in order to redirect West Creek around the pit. Mine road stream crossings may also require an authorization.

Other federal authorizations that are or may be required for the Project include:

- Navigable Waters Protection Act permits (administered by Transport Canada) may be required for stream crossings and/or diversions.



- Explosives storage and handling permits from Natural Resources Canada.

Operation of the project also will be subject to the Metal Mining Effluent Regulations (MMER) under Section 36 of the Fisheries Act.

### **MAKWA MINE CLOSURE REQUIREMENTS**

The Makwa mine will have to be closed in compliance with the Manitoba Regulation (67/99). A mine closure plan will have to be prepared, including an independent estimate of closure costs. This estimate of closure costs will form the basis for the financial assurance that must be posted. The proposed closure plan must be submitted to the Manitoba Mines Branch and Manitoba Conservation along with the Project EIS as part of the Environment Act Licence proposal.

### **MAYVILLE**

Mayville's environmental setting is very similar to Makwa's environmental setting, except Mayville is not located in or adjacent to a Provincial Park. Surface elevations range from 290 masl to 320 masl. Annual, average precipitation ranges from 573 to 577 mm (1/4 as snowfall), with a mean, 24-hr rainfall intensity of 52.7 mm. Mean annual wind speed ranges from 7.2 km/hr to 10.3 km/hr (30 year period).

The Mayville Project is located in a large area of bedrock surrounded by organic deposits that overlie loamy to clayey glaciolacustrine sediments (Smith et al 1998). Depth to groundwater is unknown, but it is presumed to be fracture controlled and should be relatively shallow.

There are 16 species of rare vascular plants with occurrences within the Mayville study area according to a search of the Manitoba Conservation Data Centre (MB CDC) (Wardrop 2010). As noted, if a rare species or habitat is located within the Mayville study area, then Mustang would submit a mitigation plan as part of their Mayville EIS to protect it or compensate for the loss.

The Project does not appear to have many endangered species of wildlife. Three animal species were identified to occur in the Mayville study area based on a search of the MB CDC database. The Project is located within the Owl-Flinstone caribou range composed of

approximately 65 animals. Further work is required to define the species count during the EIS process.

Mayville is located in the northern sub drainage of the Winnipeg River watershed. Mayville is located exclusively in the Maskwa River watershed [approximately 58,555 ha (Tembec 2009)] that discharges into the Winnipeg River at a point approximately 3.1 km upstream of Manitoba Hydro's Pine Falls generating station. Cat Creek is near the north and east sections of the Project site. There are no fish species listed under the Manitoba Endangered Species Act that have been identified near the Mayville Project site.

## **ENVIRONMENTAL STUDIES**

An Environmental Scoping Study of the Mayville Project area was completed by Wardrop (Purchased by Tetra Tech in 2009) for Mustang in 2006 to 2009, with a report prepared in September 2010. The findings are summarized below.

### ***MAKWA AND MAYVILLE TAILINGS AT THE MAYVILLE PROPERTY***

Tailings samples were provided from the bench-scale metallurgical test work which was representative of the milling process proposed for the Project. Preliminary acid base accounting (ABA) results indicate that the tailings have a high NP. This inventory of NP is of benefit in neutralizing any acid that may develop locally in the Mayville TMF, where seepage would have to flow through underlying saturated NP-rich tailings. Therefore, a water cover is not required for operation and closure of the TMF. On closure, tailings can be beached, covered with a water-shedding layer such as clay and re-vegetated.

The processing plan will take process water from the TMF and fresh water from the Maskwa River tributaries. Water from the TMF, on passing through a polishing pond, will be discharged into the Maskwa River, a tributary of the Winnipeg River. Surface runoff around the processing plant will be directed to a settling pond and pumped back to the plant.

More information on metal leaching will be derived from the humidity cell tests, which need to be re-started.

## MAYVILLE PROJECT PERMITTING

Under the Environment Act, all mines in Manitoba are considered Class 2 Developments and require an Environment Act License prior to initiation of any works. An Environment Act License is issued upon the Minister's acceptance of an Environment Act Proposal (EAP), Environmental Impact Statement (EIS), and a Mine Closure Plan. The Manitoba process for environmental assessment and permitting is unique in that it offers a one-window approach, meaning that Mustang may apply for the required provincial environmental permits, licences, and authorizations concurrently with the EIS.

A full, federal comprehensive study will also be required because the Project will be milling at a rate greater than 3,000 tpd. It is likely that a Federal Fisheries Act Section 35(2) authorization will be required to divert West Creek around the pit perimeter.

Manitoba requires an eight-stage environmental assessment process as summarized below through the Manitoba Environmental Assessment and Licensing (EAL) Branch of the Manitoba Conservation department:

- **Stage 1:** Submission of a Project Proposal and Environment Act License Proposal Form.
- **Stage 2:** Initial Review by the Manitoba Environmental Assessment and Licensing (EAL) Branch.
- **Stage 3:** Development of Terms of Reference by the EAL Branch based on the initial proposal and discussions with Mustang Minerals.
- **Stage 4:** Mustang will provide predevelopment environmental and socio-economic baseline studies.
- **Stage 5:** An Environmental Impact Assessment (EIA), which uses the information gathered in Stage 4 (Baseline Studies) and evaluates the Project's impacts, both adverse and beneficial.
- **Stage 6:** An Environmental Impact Statement (EIS) will be generated and will contain the baseline studies, EIA, and closure plan. This study will contain a detailed project description.
- **Stage 7:** The Licensing Branch of Manitoba Conservation will review the Environment Act Proposal (EAP) and EIS submitted by Mustang Minerals. A public review and comment period will be in effect during this stage.
- **Stage 8:** During this stage the Minister of Conservation will either approve the License with limits, terms and conditions or refuse the License. If they refused, Mustang would have 30 days to appeal or adjust their application and resubmit.

The Federal and Provincial licences and permits listed below may be required for operation of the Project.

- Mineral Lease under the Mines and Minerals Act
- Road Construction Permit under the Highways and Transportation Act
- Crown Land Use Permit under the Crown Lands Act
- Fish Habitat Authorization under the Fisheries Act
- Quarry Permit under the Mines and Minerals Act
- Water rights License for water withdrawal from each source (Manitoba Regulation 126/87);
- Storage and Handling of Petroleum Products and Allied Products permit (Manitoba Regulation 188/2001)
- Authorization under the Onsite Wastewater Management Systems Regulation (Manitoba Regulation 83/2003)
- Timber Permit under the Forest Use and Management Regulation (Manitoba Regulation 227/88 R)
- Operating Permit under the Waste Disposal Grounds Regulation (Manitoba Regulation 150/91)
- Magazine License under Operation of Mines Regulation (Manitoba Regulation 228/94)
- Registration As a Hazardous Waste Generator under the Dangerous Goods Handling and Transportation Act

## **MAYVILLE SOCIAL OR COMMUNITY REQUIREMENTS**

This area of Manitoba was developed through mining, forestry, rail roads, farming and major hydroelectric projects. Transportation systems were developed to support the forestry and mining industries. The Winnipeg River contains six major hydroelectric power generating stations; Pointe du Bois, Great Falls, Seven Sisters, Slave Falls, Pine Falls, and McArthur Falls.

Currently; agriculture, forestry, mining, tourism, hydroelectricity power production, and technology are the basis for the regional economy. The nearby Provincial Parks are Nopiming and Whiteshell. It is assumed by the First Nations communities that they will supply most of the labour for the Mayville and Makwa operations. The following larger municipalities and First Nations are located near the Project site:

- Fort Alexander (Sagkeeng First Nation);
- Black River First Nation;
- Brokenhead First Nation;
- Hollow Water First Nation;
- Rural Municipality (RM) of Lac du Bonnet;
- Town of Lac du Bonnet;
- Local Government District (LGD) of Pinawa;

- RM of Alexander;
- Town of Powerview-Pine Falls; and
- Pointe du Bois.

No archeological sites have been identified in the vicinity of the Mayville Project site.

Tembec, a large forestry company, controls Forest Management Licence (FML) 1 near the site. Wild rice harvesting occurs in and around Maskwa Lake. Recreational hunting and fishing, and commercial trapping occur in the area.

The Mayville Project is located approximately seven kilometres to ten kilometres from the Nopiming Provincial Park. Both the Trans-License Boundary Road and Provincial Road 314 run through the park.

Mustang has maintained relationships with the First Nation groups in the area. A Traditional Ecological Knowledge assessment has been recommended by Wardrop (Purchased by Tetra Tech in 2009) as part of the environmental baseline studies.

## **MAYVILLE MINE CLOSURE REQUIREMENTS**

The Mayville mine will have to be closed in compliance with the Manitoba Regulation (67/99). A mine closure plan will have to be prepared, including an independent estimate of closure costs. This estimate of closure costs will form the basis for the financial assurance that must be posted. The proposed closure plan must be submitted to the Manitoba Mines Branch and Manitoba Conservation along with the project EIS as part of the Environment Act Licence proposal.

RPA has used as a preliminary estimate that the closure costs will be approximately C\$0.30/t.

## 21 CAPITAL AND OPERATING COSTS

### CAPITAL COSTS

Pre-production capital cost is C\$206.8 million, including US\$24.3 million for pre-stripping and C\$50.4 million for initial mining equipment. Capital costs for the Mayville-Makwa Project are summarized in Table 21-1.

**TABLE 21-1 SUMMARY OF PROJECT CAPITAL COSTS**  
**Mustang Minerals Corp. – Makwa-Mayville Project**

<b>Capital Category</b>	<b>Pre-production (C\$000)</b>	<b>Sustaining (C\$000)</b>	<b>Total (C\$000)</b>
Direct Capital Cost			
Pre-stripping - Makwa	24,320	-	24,320
Pre-stripping - Mayville	-	-	-
Mine Equipment - Makwa	50,449	-	50,449
Mine Equipment - Mayville	-	-	-
Plant - Mayville	63,037	1,113	64,150
Infrastructure - Mayville	11,722	-	11,722
Infrastructure - Makwa	1,208	-	1,208
Tailings and Water Management	6,339	-	6,339
<b>Direct Subtotal</b>	<b>157,074</b>	<b>1,113</b>	<b>158,187</b>
Indirects			
EPCM and Owners' Cost	24,807	445	25,252
Directs + Indirects	181,880	1,558	183,439
Contingency on Plant, Infra., and Tailings	24,903	440	25,343
<b>Sub-Total Capital Cost</b>	<b>206,783</b>	<b>1,998</b>	<b>208,781</b>
Sustaining Plant		17,320	17,320
Sustaining Infrastructure		2,105	2,105
Sustaining Tailings		12,062	12,062
Sustaining Mine		48,772	48,772
Salvage		-	-
Reclamation and Closure		11,722	11,722
<b>Total Capital Cost</b>	<b>206,783</b>	<b>93,905</b>	<b>300,688</b>

## MINING CAPITAL COSTS

The mining capital costs include the mining equipment and the pre-production costs at Makwa. Table 21-2 lists the mine equipment required during the pre-production period adding to a total of C\$50.5 million.

**TABLE 21-2 PRE-PRODUCTION MINE EQUIPMENT CAPITAL COSTS**  
**Mustang Minerals Corp. – Makwa-Mayville Project**

Activity	Equipment Type	Price (\$000)	Year-2 No.	Year-1 No.	Capital Year-2 (\$000)	Capital Year-1 (\$000)	Total (\$000)
Loading	CAT 992	2,479.7	2	1	4,959	2,480	7,439
Hauling	CAT 777	1,719.0	4	8	6,876	13,752	20,628
Drilling	DM-45	910.8	3	1	2,732	911	3,643
Roads & Dumps							
	Dozers (CAT D9)	983.8	3	2	2,951	1,968	4,919
	Graders (CAT 16G)	727.7	2		1,455	-	1,455
	Water Trucks (7,000 gal)	459.7	1	2	460	919	1,379
	Loader (CAT 988)	1,706.6	1		1,707	-	1,707
Other (Dewatering, Light Vehicles, etc.)						9,279	9,279
<b>Total</b>					<b>21,141</b>	<b>29,308</b>	<b>50,449</b>

The capital mining cost of the pre-production period was estimated based on C\$1.62/t mined for the 15 Mt of pre-production required at Makwa, for a total of approximately C\$24.3 million.

## PROCESSING CAPITAL COSTS

The processing capital costs are divided into two phases, with allowance for additional room in the concentrator building for Phase 2.

Capital costs for Makwa Phase 1 are shown in Table 21-3 and are estimated to be C\$103.9 million, including C\$61.4 million for direct costs and C\$42.5 million for indirect costs and contingency (30%).

Capital costs for Phase 2 are estimated to be C\$4.7 million, including C\$2.8 million for direct costs and C\$2.0 million for indirect costs and contingency (30%).

Costing is based on RPA in-house costing information, supplemented by knowledge of local conditions. Costs are in Q2 2013 US dollars. Allowance has been made for additional equipment and engineering for Phase 2. Contingencies are in the order of 30% to account

for the accuracy of the estimate. No pricing has been included for the use of equipment presently owned by Mustang, and located at a separate location.

**TABLE 21-3 CONCENTRATOR CAPITAL COSTS**  
Mustang Minerals-Makwa/Mayville Project

Headings	Makwa Plant Phase 1 (C\$ 000)	Mayville Plant Phase 2 (C\$ 000)	Total (C\$ 000)
Equipment	24,537	1,213	25,750
Installation Labour	15,115	772	15,887
Concrete	2,068	100	2,168
Piping	6,651	322	6,973
Structural Steel	2,260	110	2,370
Instrumentation	1,537	75	1,611
Insulation	780	38	818
Electrical	3,169	154	3,323
Mill Building	5,250	0	5,250
<b>Direct Costs</b>	<b>61,367</b>	<b>2,783</b>	<b>64,150</b>
EPCM & Owner's Cost	24,139	1,113	25,252
<b>Indirect Costs</b>	<b>24,139</b>	<b>1,113</b>	<b>25,252</b>
<b>Total Direct and Indirect Costs</b>	<b>85,506</b>	<b>3,896</b>	<b>89,402</b>
Contingency (30%)	18,410	835	19,245
<b>Project Cost</b>	<b>103,916</b>	<b>4,731</b>	<b>108,647</b>

Exclusions from the capital cost estimate include, but are not limited to, the following:

- Project financing and interest charges;
- Working capital; and
- Escalation during construction.

### INFRASTRUCTURE CAPITAL COSTS

The infrastructure capital costs for Mayville were estimated at C\$11.7 million using Mining Cost Service (2012-2013) and R.S. Means (2013) as references, and include access roads, surface mine and processing facilities, TMF, office complex and laboratory, communications systems, power supply, and water management facilities. The infrastructure capital costs for Makwa are C\$1.2 million and include access roads; mine office, shops, and warehouses; and storage facilities.



## OPERATING COSTS

A summary of the Project's operating cost is shown in Table 21-4.

**TABLE 21-4 SUMMARY OF PROJECT OPERATING COSTS**  
**Mustang Minerals Corp. – Makwa-Mayville Project**

<b>Operating Costs</b>	<b>Units</b>	<b>Makwa</b>	<b>Mayville</b>
Mining (Open Pit)	\$/t mined	1.88	2.04
Stock Pile Re-handling	\$/t milled	0.06	0.06
Processing	\$/t milled	10.50	10.50
Grade Control	\$/t milled	0.05	0.05
Other Power & Heat	\$/t milled	0.22	0.22
Makwa Mineralized Material Transport	\$/t milled	5.64	-
G&A	\$/t milled	2.03	2.03
<b>Total Unit Op. Cost - Excluding Mining</b>	\$/t milled	<b>18.49</b>	<b>12.85</b>

Table 21-5 summarizes the Project average mining operating cost estimate generated from the LOM production schedule presented in Section 16. RPA used the following key cost drivers to derive the mine operating cost estimate:

- Diesel fuel: C\$0.85/L
- Haul Truck Tire Cost: C\$20,536/radial tire (4,200 hr/tire)
- ANFO (Blasting Agent) C\$650/tonne

**TABLE 21-5 SUMMARY OF PROJECT MINE OPERATING COSTS**  
**Mustang Minerals Corp. – Makwa-Mayville Project**

<b>Activity</b>	<b>Makwa \$/t</b>	<b>Mayville \$/t</b>
Drilling	0.09	0.09
Blasting	0.28	0.28
Loading	0.16	0.16
Mine Hauling	0.39	0.55
Roads & Dumps	0.13	0.13
Ancillary	0.07	0.07
Labor	0.74	0.74
Dewatering	0.03	0.03
<b>Totals</b>	<b>1.88</b>	<b>2.04</b>

Process operating costs are based on in-house RPA costing information, labour complement. Costs have been based on operating knowledge and current labour pricing in Canada. The labour burden is estimated at 35%. The concentrator operating cost is estimated at C\$10.50/t milled, and is shown below in Table 21-6.

**TABLE 21-6 CONCENTRATOR OPERATING COSTS**  
**Mustang Minerals Corp. – Makwa-Mayville Project**

Description	C\$/t
Power	1.07
Operating Supplies	7.13
Labour	1.60
Miscellaneous	0.71
<b>Total</b>	<b>10.50</b>

Power usage is estimated from similar plant sizing. Power costs are estimated using C\$0.045/kWh Manitoba power cost. Operating supplies are based on in-house data. Maintenance supplies are based on a percentage of operating supplies. Contingencies have been added to supplies, to account for unknowns.

## MANPOWER

A summary of the Project's nominal manpower is shown in Table 21-7.

**TABLE 21-7 SUMMARY OF MAYVILLE-MAKWA MANPOWER**  
**Mustang Minerals Corp. – Makwa-Mayville Project**

Department	Salary	Hourly	Total
Mining			
Operations	13	0	13
Operators (46 initially)		139	139
Maintenance (32 initially)	2	43	45
Support (Geologists, Engineers, Surveyors)	6	6	12
<b>Subtotal</b>	<b>21</b>	<b>188</b>	<b>209</b>
Processing			
Operations		21	21
Maintenance		10	10
Laboratory	1	3	4
Support (Metallurgists, Technicians)	8		8
<b>Subtotal</b>	<b>9</b>	<b>34</b>	<b>43</b>
G&A-			
Management	5	8	13

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<b>Department</b>	<b>Salary</b>	<b>Hourly</b>	<b>Total</b>
HSE	3	2	5
Site Security and Maintenance	3	11	14
<b>Subtotal</b>	<b>11</b>	<b>21</b>	<b>32</b>
<b>Grand Total</b>	<b>41</b>	<b>243</b>	<b>284</b>

## PROJECT SCHEDULE

As noted previously in this report, the processing facility, offices, and primary infrastructure will be located at the Mayville project area. All administration will be headquartered at the Mayville site. Makwa facilities like fuel storage, explosives storage, offices, and truck shop will be considered temporary. The overall project implementation schedule is presented in Table 21-8 (as of September 2013). The main engineering, procurement, and construction activities are indicated. The information contained in this schedule is derived from information taken from supplier's quotes or in-house database.

It is assumed that all permits required are approved and received at the date stated in the schedule. It is assumed that a construction week will be six days at a regular 20 hours per day. No winter allowances are included for civil works such as concrete. The schedule assumes that all concrete work will be done from late spring to late fall.

The priority activities, which are part of the critical path, are the preparation of the feasibility study, the grinding mills and permitting.

The project duration is particularly dependent on selection of the grinding mills and may be reduced if suitable used equipment can be found for the Makwa-Mayville combined Project. The overall project schedule is also dependent on the permitting schedule, and particularly on the timing of submission of the Environmental Act Licence proposal since certain work is not permitted subsequent to submission of the proposal.

**TABLE 21-8 PROJECT SCHEDULE**  
Mustang Minerals Corp. – Makwa-Mayville Project

Estimated Project Schedule	Year 1				Year 2				Year 3				Year 4				Year 5				Year 6				Year 7				Yr 8	Yr 9	Yr 10	Yr 11	Yr 12	Yr 13	Yr 14	Yr 15	Yr 16	Yr 17	Yr 18			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4						
Project Proposal (Draft Project Description)	█*																																									
Submission of Project Proposal					█																																					
Technical Advisory Committee (TAC) Review									█																																	
Environmental Baseline Study													█																													
Final Project Description																																										
Environmental Impact Assessment (EIA)																																										
Closure Plan																																										
Community and First Nation Engagement																																										
Submission of Environmental Impact Statement (EIS)																																										
Provincial Review																																										
Federal Review																																										
Minister Approval																																										
Pre-Feasibility Study																																										
Feasibility Study																																										
Basic Engineering/Construction Drawings																																										
Mayville Plant Construction																																										
Makwa Temporary Facilities Construction																																										
Makwa Pit Mining/Processing																																										
Makwa Closure																																										
Mayville Mining/Processing																																										
Mayville Closure																																										

## 22 ECONOMIC ANALYSIS

The economic analysis contained in this report is based, in part, on Inferred Resources, and is preliminary in nature. Inferred Resources are considered too geologically speculative to have mining and economic considerations applied to them and to be categorized as Mineral Reserves. There is no certainty that economic forecasts on which this Preliminary Economic Assessment is based will be realized.

A pre-tax and after-tax cash flow projection has been generated from the LOM production schedule and capital and operating cost estimates, and is summarized in Table 22-1. A more detailed cash flow summary is presented in Table 22-3.

**TABLE 22-1 SUMMARY OF MAYVILLE-MAKWA CASH FLOW SUMMARY**  
**Mustang Minerals Corp. – Makwa-Mayville Project**

<b>Description</b>	<b>Unit</b>	<b>Value</b>
Pre-Tax IRR	%	17
Pre-tax NPV at 0.0% discount rate	C\$000	336,474
Pre-tax NPV at 7.5% discount rate	C\$000	109,058
Pre-tax NPV at 10% discount rate	C\$000	68,089
After-Tax IRR	%	16
After-tax NPV at 0.0% discount rate	C\$000	314,484
After-Tax NPV at 7.5% discount rate	C\$000	97,441
After-Tax NPV at 10% discount rate	C\$000	58,480

A summary of the key criteria is provided below.

### ECONOMIC CRITERIA

#### REVENUE

- Approximately 8,300 mineralized tonnes per day processed from two separate open pits (approximately three million tonnes per year).
- Processing recoveries at Makwa and Mayville for nickel, copper, platinum, palladium, cobalt and gold metals are summarized in Table 22-2:

**TABLE 22-2 SUMMARY OF MAYVILLE-MAKWA PROCESSING RECOVERY**  
**Mustang Minerals Corp. – Makwa-Mayville Project**

<u>Recovery</u>	<u>Makwa</u>	<u>Mayville</u>
Ni	73.8%	40.0%
Cu	80.0%	90.0%
Co	39.9%	
Pt	64.6%	32.0%
Au	14.0%	55.0%
Pd	74.9%	80.0%

- Gold, platinum, and palladium payments at refinery vary for each concentrate;
- Exchange rate US\$1.00 = C\$1.111.
- Metal prices for cash flow: US\$8.50/lb – nickel; US\$3.40/lb – copper, US\$1,650/oz – gold; US\$14.00/lb - cobalt; US\$1,800/oz – platinum; and US\$800/oz – palladium.
- Nickel, copper, cobalt, platinum, palladium, and gold gross revenue percentage contributions are 44.3%, 46.8%, 0.3%, 1.8%, 5.0%, and 1.4%, respectively.
- NSR includes doré refining, transport, and insurance costs.
- No salvage value was applied to any of the equipment or infrastructure.
- Project Life: 14 years.
- Makwa Mine Life: 4 years.
- Mayville Mine Life: 8 years, plus 4 years of stockpile processing.
- Yearly revenues were calculated by subtracting the applicable refining charges and transportation costs from the payable metal value.
- Revenue is recognized at the time of production.
- There were 5.4 Mt of Inferred Resources used in the production schedule.

## **COSTS**

- Pre-production period: 24 months (Year -2 and Year -1).
- Unit operating costs for mining, processing, power, fuel, and G&A were applied to annual mined/processed tonnages, to determine the overall yearly operating cost.
- Mine life capital totals US\$300.7 million, including reclamation.

## ROYALTIES

- An existing royalty agreement for 1% of NSR may be reduced to 0.5% by payment by Mustang of C\$500,000 to Global Nickel.

## TAXATION

RPA has relied on Mustang with respect to all taxation rates and rules associated with the Project, including, but not limited to, any associated municipal, provincial, state, and federal taxes, royalties and other production-based taxes, and other applicable laws that would allow for the modification of taxes applicable to the project. The after-tax cash flow model contained in this report includes the application of the tax rates and rules provided by the client.

Table 22-3 shows a cash flow summary for the combined Mayville and Makwa operation.





## CASH FLOW ANALYSIS

The financial model was established on a 100% equity basis, which does not include debt financing and loan interest charges.

Considering the Project on a stand-alone basis, the undiscounted after-tax cash flow totals \$314.5 million over the mine life, and simple payback occurs approximately 3.5 years from start of production.

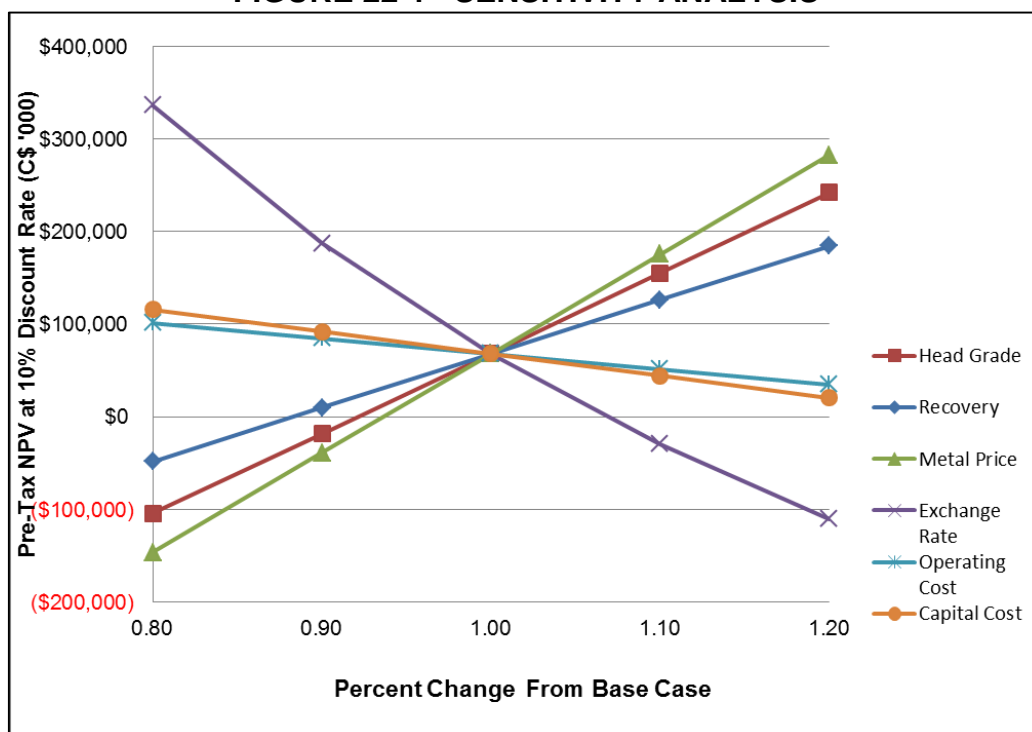
A pre-tax Net Present Value (NPV) at a 7.5% discount rate is \$109.1 million and the pre-tax Internal Rate of Return (IRR) is 17%. An after-tax NPV at 7.5% discount rate is approximately US\$97.4 million, with an IRR of 16%.

## SENSITIVITY ANALYSIS

Project risks can be identified in both economic and non-economic terms. Key economic risks were examined by running cash flow sensitivities:

- Nickel price;
- Copper price;
- Palladium price
- Platinum price;
- Cobalt price;
- Head Grades;
- Recoveries;
- Operating costs; and
- Pre-production capital costs.

NPV sensitivity over the base case has been calculated for -20% to +20% variations. The sensitivities are shown in Figure 22-1 and Table 22-4.

**FIGURE 22-1 SENSITIVITY ANALYSIS**

**TABLE 22-4 SENSITIVITY ANALYSES  
Mustang Minerals Corp. – Makwa-Mayville Project**

Parameter Variables	Units	-20%	-10%	Base	10%	20%
Nickel Price	US\$/lb	7.56	8.50	9.44	10.39	11.33
Exchange Rate	US\$/C\$	0.72	0.81	0.90	0.99	1.08
Head Grade (Nickel Only)	%	0.33%	0.38%	0.42%	0.46%	0.50%
Total Cash Cost	\$millions	1,053.9	1,078.1	1,102.4	1,126.6	1,150.9
Total Capital Cost	\$millions	240.6	270.6	300.7	330.8	360.8
<b>Pre-Tax NPV @ 10%</b>	<b>Units</b>	<b>-20%</b>	<b>-10%</b>	<b>Base</b>	<b>10%</b>	<b>20%</b>
Nickel Price	\$millions	(\$146.4)	(\$39.2)	\$68.1	\$175.3	\$282.6
Exchange Rate	\$millions	\$336.2	\$187.3	\$68.1	(\$29.4)	(\$110.7)
Head Grade (Nickel Only)	\$millions	(\$104.2)	(\$18.3)	\$68.1	\$154.9	\$242.0
Total Cash Cost	\$millions	\$101.5	\$84.8	\$68.1	\$51.4	\$34.6
PPD Capital Cost	\$millions	\$115.6	\$91.8	\$68.1	\$44.3	\$20.6

## 23 ADJACENT PROPERTIES

### MAKWA ADJACENT PROPERTIES

The entire Makwa deposit is located on the Makwa Property, and there are no separate properties directly associated with Makwa.

### BIRD RIVER PROJECT

On January 7, 2008, Marathon PGM Corporation (Marathon) announced that it will have an option to earn an interest of 70% in the Ore Fault property of Bird River Mines Inc. The property is part of Marathon's Bird River project which is adjacent to the northern boundaries of Mustang's MUM 4, JADE 3B and JADE 4B claims. In the same press release, Marathon announced that it would conduct detailed ground IP surveys to be followed by drilling. Marathon has announced the results of exploration in a series of press releases through May 28, 2008 (see [www.marathonpgm.com](http://www.marathonpgm.com)). Nickel, copper and platinum group metal mineralization has been identified on the Bird River project.

The information contained in the Marathon press releases has not been independently verified by the authors of this report. The authors of this report have not verified whether the exploration targets identified by Marathon represent an extension of mineralization at the Makwa Property.

### OWYHEE PROPERTY OPTION

On January 22, 2007, Mustang entered into an option agreement over a total of 22 mining claims located 35 km north of the Makwa Property comprising 4,507 ha from Norman Reed Paterson et al. (the Owyhee Property Option). The terms of the option agreement required work commitments of approximately \$400,000 and a total cash consideration of \$5,000 to Owyhee. The Owyhee Property Option was part of the 2007 VTEM survey conducted by Mustang. Following the survey there was a drill campaign later in the year testing a small number of geophysical anomalies. This drill program consisted of eight NQ sized drill holes for a total of 1,014 m. In 2008, there was a small geological mapping program. In 2010, Mustang carried out another small drill program of two NQ-sized drill holes for a total of 277 m.

In January 2011, the terms of the option agreement were revised to include the issuance of 120,000 common shares of Mustang in the first year, payment of \$15,000 on the first anniversary date, \$25,000 on the second anniversary date, and \$100,000 on the third anniversary date at the option of Mustang. The revised option agreement did not have any work commitments for the claims. The agreement was terminated by Mustang as of November 27, 2012.

## **MAYVILLE ADJACENT PROPERTIES**

The M2 Deposit is located entirely within the Mayville Property. There are no significant deposits or mineralized zones on the immediately adjacent properties. RPA has independently verified this information and this information is indicative of the mineralization at the Mayville project.

## **24 OTHER RELEVANT DATA AND INFORMATION**

No additional information or explanation is necessary to make this Technical Report understandable and not misleading.

## 25 INTERPRETATION AND CONCLUSIONS

Based on the results of the PEA, RPA offers the following conclusions:

RPA offers the following conclusions:

### GEOLOGY AND MINERAL RESOURCES

- Work to date on the geological interpretation and modelling of the Makwa and Mayville deposits is appropriate for the current level of evaluation.
- The exploration work, including drilling, sampling, and database management, meets industry standard practices. The drill hole databases are valid and suitable to estimate Mineral Resources for the Project.
- RPA updated the Mineral Resource estimates for the Makwa and Mayville deposits use drill hole data available to October 2009 and December 2013, respectively. Since the database cut-off dates, a minor amount of drilling has been done on both properties. RPA reviewed results from the new drilling in section and level plan and confirmed that those data would have only a minor impact on the local grade estimate and that overall the block models are still valid and current. The Mineral Resource statements for both deposits reflect updated and current economic factors. The Mineral Resources are constrained within a preliminary open pit and are reported in Table 25-1:

**TABLE 25-1 MINERAL RESOURCE SUMMARY AS OF NOVEMBER 27, 2013**  
**Mustang Minerals Corp. – Makwa-Mayville Project**

Class and Deposit	Tonnes (Mt)	Ni (%)	Cu (%)	Pt (g/t)	Pd (g/t)	Au (g/t)	Co (%)
<b>Indicated</b>							
Makwa	7.2	0.61	0.13	0.10	0.36	N/A	0.01
Mayville	26.6	0.18	0.44	0.05	0.14	0.05	N/A
<b>Total Indicated</b>	<b>33.8</b>	<b>0.27</b>	<b>0.37</b>	<b>0.06</b>	<b>0.19</b>	N/A	N/A
<b>Inferred</b>							
Makwa	0.7	0.27	0.08	0.05	0.14	N/A	0.02
Mayville	5.2	0.19	0.48	0.06	0.15	0.04	N/A
<b>Total Inferred</b>	<b>5.8</b>	<b>0.19</b>	<b>0.43</b>	<b>0.06</b>	<b>0.15</b>	N/A	N/A

Notes:

1. CIM definitions have been followed for classification of Mineral Resources.
2. Mineral Resources are reported at an NSR cut-off value of C\$15/tonne at Mayville and C\$20.64/tonne at Makwa
3. At Mayville, NSR values are calculated in C\$ using factors of \$51 per % Cu and \$41 per % Ni. These factors are based on metal prices of US\$3.40/lb Cu and US\$8.50/lb Ni, estimated recoveries and smelter terms, and a US\$/C\$ exchange rate of 0.97.

4. The Mineral Resources are estimated using metal prices of US\$3.40/lb Cu and US\$8.50/lb Ni, estimated recoveries and smelter terms, and a US\$/C\$ exchange rate of 0.97. The NSR factors used are: \$87.33 per % Ni, \$29.65 per % Cu, \$38.25 per % Co, \$0.14 per g/t Pt and 0.08 per g/t Pd.
5. Totals may not add correctly due to rounding.

### **MINING AND MINERAL RESERVES**

- Conventional open pit mining methods (drilling, blasting, loading, and hauling) will be employed to extract the mineralized material and waste.
- Mining will start at Makwa, with production from a single pit, followed by a single open pit at Mayville. Pit benches will be five metres high for Makwa and ten metres high for Mayville.
- Mining will be conducted by Mustang.
- There are no current Mineral Reserves at the Project. The PEA is based on those Mineral Resources with reasonable prospects for economic extraction by open pit mining and flotation recovery.
  - Approximately 39.1 Mt at an average grade of 0.25% Ni and an average grade of 0.37% Cu, factored for dilution and extraction, are potentially mineable by open pit methods. Approximately 33.6 Mt of these resources are classified as Indicated and 5.4 Mt, as Inferred.
  - The LOM stripping ratio is 7.9:1 for Makwa and 6.0:1 for Mayville.
  - At an average production rate of approximately 8,200 tpd, or 3.0 Mtpa, the Project life is approximately 14 years, with four years of mining at Makwa and eight years of mining at Mayville, plus four years of stockpile processing.
- Both the Makwa and Mayville pits will require dewatering.
- Topographical relief, climate, haul distances, and political location do not appear to be issues for the combined Makwa-Mayville Project.

### **METALLURGICAL TESTING AND MINERAL PROCESSING**

- It has been shown by way of metallurgical testing that the Makwa and Mayville mineralization is amenable to flotation concentration, and the concentration process flow sheet has potential to be taken to a further development stage.
- The samples that have been tested from the combined Makwa-Mayville Project show that the material is amenable to concentration for the nickel, copper, cobalt, palladium, platinum by flotation concentration.
- The dominant metal from the Makwa property is nickel, and the dominant metal from the Mayville property is copper.
- It appears from testwork complete to date that the Makwa mineralized material can be concentrated into a nickel-copper concentrate, and mineralized material from the Mayville Property can be concentrated into two separate concentrates, one copper and one nickel.
- The concentrator will be located at the Mayville Property. Mineralized material from Makwa will be hauled 43 km to the concentrator.

- It is anticipated that concentrates will be trucked to Molson, Manitoba and then railed to a nickel smelter near Sudbury, Ontario.

**ENVIRONMENTAL ASPECTS AND PERMITTING**

- The Project is subject to the Province of Manitoba and Federal Canadian permitting requirements and environmental regulations.
- Preliminary baseline studies indicate that there are no endangered species in the vicinity of the Project.

**ECONOMIC ANALYSIS**

- The total capital cost for the Project is estimated to be \$300.7 million, including \$208.8 million in pre-production and \$91.9 million in sustaining capital.
- In order to minimize the capital costs, and due to the moderate mine life, Mustang will excavate the open pits and process the Makwa mineralized material, followed by the Mayville mineralized material.
- The total unit operating cost is \$18.5/t milled for Makwa and \$12.9/t milled for Mayville, including grade control, stockpile re-handling and G&A costs.
- The base case economic analysis indicates that the Project has a positive cash flow. The after-tax NPV at 7.5% discount rate is approximately US\$97.4 million, with an IRR of 16%.



## 26 RECOMMENDATIONS

RPA recommends that Mustang continue to evaluate the technical and economic viability of the combined Makwa-Mayville Project by means of a PFS. Many of the parameters and inputs listed in the May 2008 Makwa PFS can be used as a basis for the combined PFS.

To advance the Project to the PFS level, additional drilling, environmental baseline studies, geotechnical drilling and studies, and metallurgical test work are recommended with a total budget of C\$3.8 million (Table 26-1).

**TABLE 26-1 PROPOSED BUDGET  
Mustang Minerals – Mayville Property**

<b>Item</b>	<b>Cost, C\$</b>
Infill drilling (3,000 m at \$150/m)	450,000
Exploration drilling (10,000 m at \$150/m)	1,500,000
Geotechnical Drilling and Studies	500,000
Metallurgical Test Work	200,000
Pre-feasibility Study	550,000
Mayville Topographical Site Survey	75,000
Operating costs/office	150,000
<b>Sub-total</b>	<b>3,425,000</b>
Contingency (10%)	343,000
<b>Total</b>	<b>3,768,000</b>

RPA recommends that Mustang continue trade-off studies for potential economic benefits for the combined Makwa-Mayville operation, such as:

- mine and processing production rates,
- owner operation and contract mining, and
- total repair and maintenance contract for a vendor-maintained mining equipment fleet.

The potential for crushing and selling the Makwa and/or Mayville pit waste rock may also be assessed.

The recommendations for specific areas of work follow.

## **GEOLOGY AND MINERAL RESOURCES**

### Makwa

- The existing geology and drill hole database for the entire property should be converted to the metric and the NAD83 grid systems so as to be compatible with the database used to prepare the Makwa Mineral Resource estimate.
- Additional exploration is warranted in order to assess the potential for mineralized areas on the property that are outside the present open pit, including the host stratigraphy below the pit shell, and the Dumbarton mine area. Defining a resource and reserve for the Dumbarton area will improve the Project's economics.
- A detailed study which examines the potential impact of the blank samples containing elevated metal values should be undertaken. Such a study would review the position of these out-of-bounds blank samples within the database relative to the mineralized intervals. Re-assaying of all samples contained within the batch associated with these out-of-bounds samples is warranted for all samples contained within the mineralized domain models.
- The individual failures should be examined initially to ensure that they are not a result of transcription or other such errors at the data entry stage. A program of re-assaying of all samples relating to the failed batches is recommended.
- Core recovery and rock quality designation measurements should be recorded as a matter of routine, including core angle data, faults, and other features. Further assessment should be made of the specific gravity of mineralized rock and waste rock.

### Mayville

- RPA recommends a drill program of 13,000 m for infill drilling and to explore along strike from the M2 Deposit. A key drill hole target is located 200 m east of the resource area where previous drilling intersected 18.53 m at an average grade of 0.56% Cu and 0.16% Ni at a vertical depth of approximately 120 m.

## **MINING**

- Commence basic engineering, including:
  - Developing detailed mine plans and schedules;
  - Developing detailed dewatering programs for the Makwa and Mayville open pits;
  - Evaluating the economics of contractor versus owner mining.
- Conduct a detailed trade-off study to determine the optimal selective mining unit required to address mining selectivity, mineralized material loss, and dilution associated with the loader/truck combination.
- Carry out a geotechnical study to determine the safest and steepest pit slopes for both the Makwa and Mayville pits. Additional geotechnical investigations should be undertaken to delineate and characterize soils containing any discontinuities for the final and interim waste dump and tailings dam slopes.
- Complete a hydrogeology study in order to provide the open pit dewatering parameters. Consideration should be given to the establishment of the overburden

dewatering parameters which will be needed for the design of surface diversions and drainage systems.

- Determine the suitability and the particle size distribution of the country rocks from the open pit area for use as rock drain material for the tailings dam construction.

#### **MINERAL PROCESSING**

- Carry out metallurgical test work to:
  - Develop flowsheet for Makwa and Mayville mineralization.
  - Test grind and regrind requirements (i.e., Bond Work Index, etc.).
  - Confirm grades and recoveries for Makwa and Mayville.
  - Test variability across mineralized zones for both Makwa and Mayville.
  - Investigate the mineralized material for the presence of material which could cause sliming during the flotation process.
  - Test the proposed flow sheet through a pilot plant.
- Carry out subsurface investigations and evaluate sources of borrow material for dam construction, roads, and other Project areas.
- Update the dam/dike design and carry out stability analyses to the PFS level.
- Carry out geochemistry analysis to the PFS stage, and determine if there is any requirement for an effluent treatment facility.
- Design and estimate to a PFS level the power, roads, and support infrastructure for the operation.

#### **ENVIRONMENTAL ASPECTS AND PERMITTING**

- Prepare a detailed water balance to assist in optimizing the design of the water treatment facilities.
- Carry out long-term geochemical characterization of mineralized material and mine wastes.
- Since the proposed waste dump locations are in the vicinity of a provincial park, the maximum dump height has been restricted such that the dumps are not visible from the Bird River and from nearby highways. Therefore, the maximum permissible dump height should be determined through a line of sight study. Upon the completion of this study a geotechnical study should be completed on the waste dumps to assess any potential stability issues with the design.
- Continue testing of the acid generating potential of the waste rock so that sequencing of the waste placement and remedial measures to mitigate any potential problems can be assessed and costs estimated. Preliminary results indicated that the waste rock will not be acid-generating. Testing of tailings should also be continued in order to assess the necessity for treatment and for closure planning.
- Model dilution of the tailings dam solution during the closure period, and the corresponding decline in the concentration of metals and compounds in the water tailings facility during and after the closure period.

- Continue the public engagement program with neighboring communities, including First Nations.

**ECONOMIC ANALYSIS**

- Obtain detailed quotes for all equipment, supplies, and permanent infrastructure.
- Obtain quotes for the mineralized material hauling contractor unit costs (\$/tonne) from the Makwa property to the Mayville concentrator facility (approximately 43 km), concentrate hauling unit costs from the Mayville concentrator to the Molson, Manitoba rail siding, and contractor equipment/operator hourly rates for special construction projects.
- Prepare detailed estimates for all mining, processing, and G&A operating costs.
- Carry out additional studies to investigate other options to improve the accuracy of capital and operating cost estimates, to optimize the mining schedule, and to investigate alternative crushing processes such as high pressure grinding rolls or vibration cone crushers which have the potential to improve the Project economics.

**IMPLEMENTATION PLAN/PROJECT DEVELOPMENT BUDGET**

- Develop a Project schedule with a Critical Path identified.

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## 28 DATE AND SIGNATURE PAGE

This report titled “Technical Report on the Preliminary Economic Assessment of the Combined Makwa-Mayville Project, Manitoba, Canada” and dated April 30, 2014, was prepared and signed by the following authors:

**(Signed & Sealed) “Stuart E. Collins”**

Dated at Lakewood, CO  
April 30, 2014

Stuart E. Collins, P.E.  
Principal Mining Engineer

**(Signed & Sealed) “David Ross”**

Dated at Toronto, ON  
April 30, 2014

David Ross, M.Sc., P.Geo.  
Principal Geologist

**(Signed & Sealed) “Reno Pressacco”**

Dated at Toronto, ON  
April 30, 2014

Reno Pressacco, M.Sc., P.Geo.  
Principal Geologist

**(Signed & Sealed) “Hugo Miranda”**

Dated at Lakewood, CO  
April 30, 2014

Hugo Miranda, MBA, C.P.  
Principal Mining Engineer

**(Signed & Sealed) “Holger Krutzelmann”**

Dated at Toronto, ON  
April 30, 2014

Holger Krutzelmann, P.Eng.  
Principal Metallurgist



## 29 CERTIFICATE OF QUALIFIED PERSON

### STUART E. COLLINS

I, Stuart E. Collins, P.E., as an author of this report entitled "Technical Report on the Preliminary Economic Assessment of the Combined Makwa-Mayville Project, Manitoba, Canada" prepared for Mustang Minerals Corp. and dated April 30, 2014, do hereby certify that:

1. I am Principal Mining Engineer with RPA (USA) Ltd. of 143 Union Boulevard, Suite 505, Lakewood, Colorado, USA 80228.
2. I am a graduate of South Dakota School of Mines and Technology, Rapid City, South Dakota, U.S.A., in 1985 with a B.S. degree in Mining Engineering.
3. I am a Registered Professional Engineer in the state of Colorado (#29455). I have been a member of the Society for Mining, Metallurgy, and Exploration (SME) since 1985, and a Registered Member (#612514) since September 2006. I have worked as a mining engineer for a total of 28 years since my graduation. My relevant experience for the purpose of the Technical Report is:
  - Review and report as a consultant on numerous exploration, development and production mining projects around the world for due diligence and regulatory requirements;
  - Mine engineering, mine management, mine operations and mine financial analyses, involving copper, gold, silver, nickel, cobalt, uranium, coal and base metals located in the United States, Canada, Mexico, Turkey, Bolivia, Chile, Brazil, Costa Rica, Peru, Argentina and Colombia.
  - Engineering Manager for a number of mining-related companies;
  - Business Development for a small, privately-owned mining company in Colorado;
  - Operations supervisor at a large gold mine in Nevada, USA ;
  - Involvement with the development and operation of a small underground gold mine in Arizona, USA.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I visited the Makwa and Mayville properties on September 17, 2013.
6. I am responsible for overall preparation of the Technical Report, and in particular for Sections 18 to 22.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have had no prior involvement with the property that is the subject of the Technical Report other than several small internal studies for Mustang.

9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
10. At the effective date of the Technical Report, 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.

Dated this 30<sup>th</sup> day of April, 2014

**(Signed & Sealed) “Stuart E. Collins”**

Stuart E. Collins, P.E.

**DAVID ROSS**

I, David Ross, M.Sc., P.Geo., as an author of this report entitled “Technical Report on the Preliminary Economic Assessment of the Combined Makwa-Mayville Project, Manitoba, Canada” prepared for Mustang Minerals Corp. and dated April 30, 2014, do hereby certify that:

1. I am a Principal Geologist with Roscoe Postle Associates Inc. of Suite 501, 55 University Ave., Toronto, ON, M5J 2H7.
2. I am a graduate of Carleton University, Ottawa, Canada, in 1993 with a Bachelor of Science degree in Geology and Queen’s University, Kingston, Ontario, Canada, in 1999 with a Master of Science degree in Mineral Exploration.
3. I am registered as a Professional Geologist in the Province of Ontario (Reg. #1192). I have worked as a geologist for a total of 20 years since my graduation. My relevant experience for the purpose of the Technical Report is:
  - Review and report as a consultant on numerous mining and exploration projects around the world for due diligence and regulatory requirements
  - Exploration geologist on a variety of gold and base metal projects in Canada, Indonesia, Chile, and Mongolia.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I visited the Mayville property most recently on December 18 and 19, 2012.
6. I am responsible for parts of Sections 4 to 12 and 14 regarding the Mayville Property and collaborated with my co-authors on Sections 1, 25, and 26 of the Technical Report.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have prepared previous Mineral Resource estimates for the Mayville Property.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
10. At the effective date of the Technical Report, 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.

Dated this 30<sup>th</sup> day of April, 2014

**(Signed & Sealed) “David Ross”**

David Ross, M.Sc., P.Geo.

## RENO PRESSACCO

I, Reno Pressacco, M.Sc., P.Geo., as an author of this report entitled "Technical Report on the Preliminary Economic Assessment of the Combined Makwa-Mayville Project, Manitoba, Canada" prepared for Mustang Minerals Corp. and dated April 30, 2014, do hereby certify that:

1. I am Principal Geologist with Roscoe Postle Associates Inc. of Suite 501, 55 University Ave., Toronto, ON, M5J 2H7.
2. I am a graduate of Cambrian College of Applied Arts and Technology, Sudbury, Ontario, in 1982 with a CET Diploma in Geological Technology, Lake Superior State College, Sault Ste. Marie, Michigan, in 1984, with a B.Sc. degree in Geology and McGill University, Montreal, Québec, in 1986 with a M.Sc.(A) degree in Mineral Exploration.
3. I am registered as a Professional Geologist in the Province of Ontario (Reg. #939). I have worked as a geologist for a total of 27 years since my graduation. My relevant experience for the purpose of the Technical Report is:
  - Review and report as a consultant on numerous exploration and mining projects around the world for due diligence and regulatory requirements, including preparation of Mineral Resource estimates and NI 43-101 Technical Reports.
  - Numerous assignments in North, Central and South America, Finland, Russia, Armenia and China in a variety of deposit types and in a variety of geological environments; commodities including Au, Ag, Cu, Zn, Pb, Ni, Mo, U, PGM and industrial minerals.
  - A senior position with an international consulting firm.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I visited the Makwa property on September 16 to 19, 2008.
6. I am responsible for parts of Sections 4 to 12 and 14 regarding the Makwa Property and collaborated with my co-authors on Sections 1, 25, and 26 of the Technical Report.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have prepared previous Mineral Resource estimates for the Makwa deposit.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.

10. At the effective date of the Technical Report, 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.

Dated this 30<sup>th</sup> day of April, 2014

**(Signed & Sealed) “Reno Pressacco”**

Reno Pressacco, M.Sc.(A), P.Geo.

**HUGO M. MIRANDA**

I, Hugo M. Miranda, C.P., as an author of this report entitled "Technical Report on the Preliminary Economic Assessment of the Combined Makwa-Mayville Project, Manitoba, Canada" prepared for Mustang Minerals Corp. and dated April 30, 2014, do hereby certify that:

1. I am Principal Mining Engineer with RPA (USA) Ltd. of 143 Union Boulevard, Suite 505, Lakewood, Colorado, USA 80228.
2. I am a graduate of the Santiago University of Chile, with a B.Sc. degree in Mining Engineering in 1993, and Santiago University, with a Masters of Business Administration degree in 2004.
3. I am registered as a Competent Person of the Chilean Mining Commission (Registered Member #0031). I have worked as a mining engineer for a total of 20 years since my graduation. My relevant experience for the purpose of the Technical Report is:
  - Principal Mining Engineer - RPA in Colorado. Review and report as a consultant on mining operations and mining projects. Mine engineering including mine plan and pit optimization, pit design and economic evaluation.
  - Mine Planning Chief, El Tesoro Open Pit Mine - Antofagasta Minerals in Chile
  - Open Pit Planning Engineer, Radomiro Tomic Mine, CODELCO – Chile.
  - Open Pit Planning Engineer, Andina Mine, CODELCO - Chile.
  - Principal Mining Consultant – Pincock, Allen and Holt in Colorado, USA. Review and report as a consultant on numerous development and production mining projects.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I visited the Makwa and Mayville properties on September 17, 2013.
6. I am responsible for Section 16 and collaborated with my co-authors on Sections 1, 25, and 26 of the Technical Report.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have had no prior involvement with the property that is the subject of the Technical Report other than several small internal studies for Mustang.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.

10. At the effective date of the Technical Report, 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.

Dated this 30<sup>th</sup> day of April, 2014

**(Signed & Sealed) “Hugo Miranda”**

Hugo M. Miranda, C.P.

**HOLGER KRUTZELMANN**

I, Holger Krutzelmann, P. Eng., as an author of this report entitled "Technical Report on the Preliminary Economic Assessment of the Combined Makwa-Mayville Project, Manitoba, Canada" prepared for Mustang Minerals Corp. and dated April 30, 2014, do hereby certify that:

1. I am Vice President, Metallurgy & Environment, and Principal Metallurgist with Roscoe Postle Associates Inc. of Suite 501, 55 University Ave Toronto, ON M5J 2H7.
2. I am a graduate of Queen's University, Kingston, Ontario, Canada in 1978 with a B.Sc. degree in Mining Engineering (Mineral Processing).
3. I am registered as a Professional Engineer with Professional Engineers Ontario (Reg. #90455304). I have worked in the mineral processing field, in operating, metallurgical, managerial; and engineering functions, for a total of 34 years since my graduation. My relevant experience for the purpose of the Technical Report is:
  - Reviews and reports as a metallurgical consultant on a number of mining operations and projects for due diligence and financial monitoring requirements
  - Senior Metallurgist/Project Manager on numerous gold and base metal studies for a leading Canadian engineering company.
  - Management and operational experience at several Canadian and U.S. milling operations treating various metals, including copper, zinc, gold and silver.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I have not visited the Makwa and Mayville properties.
6. I am responsible for Sections 13 and 17 and collaborated with my co-authors on Sections 1, 25, and 26 of the Technical Report.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have had no prior involvement with the property that is the subject of the Technical Report.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.



10. At the effective date of the Technical Report, 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.

Dated this 30<sup>th</sup> day of April, 2014

**(Signed & Sealed) “Holger Krutzelmann”**

Holger Krutzelmann, P.Eng.