Effective Date: 30 June 2010

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VALE LIMITED

EXTERNAL AUDIT OF MINERAL RESERVES

VOLUME 2, SECTION 2

MANITOBA OPERATIONS

Submitted to:
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2060 Flavelle Blvd, Sheridan Park
Mississauga, Ontario
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REPORT

Report Number: 10-1117-0032 Phase 2000

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Executive Summary

Golder Associates Ltd.'s (Golder) Competent Persons, David Sprott, P.Eng., and Paul Palmer, P.Eng., P.Geo., have visited the Manitoba Operations Project the week of July 5, 2010 and validated that part of the mineral resource that is the basis for the following mineral reserve estimate as at June 30, 2010 for the Manitoba Operations Project.

During the site visit, they inspected mining operations, interviewed personnel and gathered information required to evaluate the appropriateness of the data and methodology used to estimate the mineral resources and mineral reserves. A list of people contacted for this study includes:

- Rob Smith – Manager – Mines Geology, Manitoba Operations
- Jean-Yves Cloutier - Director Mineral Reserve Mineral Resource, Vale Business Planning Group
- Rob Stewart – Manager – Exploration TNB, Vale Business Development
- Glen House – Senior Geologist, Mines Exploration
- Brenda Bilton – Resource Geologist, Mines Exploration
- Al Proulx – Chief Mine Geologist T-3 Mine
- Dave Babulic – Chief Mine Geologist Birchtree Mine
- Tim Mayor – Chief Mine Geologist T-1 Mine
- Janet Southern – Resource Geologist Birchtree Mine
- Angie Pavetey – Resource GIT T3 Mine
- Holly Davidson – Resource Geologist T1 Mine
- Joan Ledwos – MEBS Database Technician, Exploration TNB, Vale Business Development
- Amy Byers – Process Engineer
- Stu Waring – General Manager, Mining and Milling, Manitoba Operations
- Faye Pilling – Senior Metals Accounting Specialist
- Cal Liske – Manager – Mines Engineering, Manitoba Operation
- Gord Bilton – Planning Engineer T1 Mine
- Inge Robinson – Divisional SupervisorT1 Mine
- Cecile Kelly – Chief Mine Engineering Supervisor Birchtree Mine
- Luc Kempers – Divisional Supervisor T-3 Mine
- Steve Peterson – Chief Mine Engineer T3 Mine
- Warren Brass – Mine Manager T1 Mine
- Darren Dodds – Manager Finance

This study includes a review of technical reports, memoranda and supporting technical information obtained from Vale. Reports on previous internal and external technical reviews and audits were also made available to Golder (e.g. an independent audit by Scott Wilson Roscoe Postle Associates Inc. carried out in December 31, 2007).

The mineral reserve estimates provided to Golder were expected to conform to the requirements of the Securities Exchange Commission's Industry Guide 7 and to Canadian National Instrument (NI) 43-101 using specific terminology from CIM (2004). No exceptions were found to these requirements.

The mineral reserve statement at June 30, 2010 for Vale was audited by Golder. The mineral reserve audited by Golder was based on the mineral resource models and was prepared using costs, optimization, mine design and scheduling practices that are appropriate. Golder accepts the procedure adopted to convert the mineral resource into a mineral reserve. The numbers are appropriate for the purpose of public reporting in that they provide an acceptable prediction of the available mineral reserves. The tonnes and grades are reported at an appropriate economic cut-off grade based on documented costs and prices.

The following table with the mineral reserve figures are provided at the appropriate level of precision for public reporting.

Manitoba Operations Mineral Reserves June 30, 2010

Mine	Category	Tonnes (000's)	% Ni	% Cu[1]
Birchtree Mine	**Proven**	2,753	1.83	0.10
	Probable	2,500	1.53	0.08
	Proven + Probable	5,254	1.69	0.09
Thompson Mine	**Proven**	5,199	1.98	0.12
	Probable	14,470	1.64	0.10
	Proven + Probable	19,669	1.73	0.11
Total Manitoba Operations	**Proven**	7,952	1.93	0.11
	Probable	16,970	1.63	0.10
	Proven + Probable	24,923	1.72	0.10

Notes:

1. Cu reserves are based on historical factors derived from corrections between Ni and Cu in assay data of diamond drill core. Thompson Mine has validated the factors by reconciling with mill credited production numbers over a 5 year period.

Significant Opinions

- ***Tailings facility capacity:** A number of options for long-term management of the tailings area were reviewed and a three-phase capital plan was developed. To date, only two phases have been initiated. The third phase of the basin capital plan is to raise dam levels by approximately 10 ft (3 m). Once the final capital project phase is approved and all three projects are successfully implemented, these changes are expected to increase the life of the tailings basin to support the life of mine of the plant site, maintain compliance to MMER, and improve the closure plan for the facility. Therefore, in order to support the life of mine plan, all three phases will need to be implemented.*

- ***Sulphur dioxide reduction at the smelter complex:** The Manitoba Operations (MO) is required to meet government regulations proposed which requires that the smelter and refineries reduce their greenhouse gas emissions by 18% by 2010 and by 2% year upon year until 2020. These requirements may result in the closure of the smelter and refinery if an economically and technically feasible solution for reducing emissions cannot be devised. However, evaluations have shown that the MO would remain economic as a mine-mill operation that sold concentrate to smelters located elsewhere (either owned by Vale or third parties.*

- ***Infrastructure Issues:** The 3600 Tram is recognized as a future bottleneck to production at the Thompson Mine and studies are ongoing to address this issue. As both the Thompson and Birchtree Mines go deeper, the delivery of key mine services like backfill and ventilation will incur greater challenges and costs. Cemented rockfill is currently planned to be the predominant backfill for future mining.*

- *Maintaining current production rates at the MO has been challenging due to ground instability issues at the Birchtree Mine and infrastructure inefficiencies from moving personnel and material in the 1D area.*

- *Sample assay data is being entered in manually through exporting CSV files into the database. Control checks are completed regularly, but were done by manual checks of spreadsheets. Opportunities to improve the process are being used at other Vale operations (Ontario and VINL) and should be considered at the MO.*

- *A small portion of older mineral resources were estimated using polygonal models and have not been updated using block models and the MO Mineable Reserves Optimizer process. Areas supported by polygonal models under estimate tons and over estimate grade. This was noted at the T1 Mine where mined grade in the current year was lower than the stated mineral reserve grade for particular blocks. It was suggested that this was due to the polygonal estimation method.*

- *A review was completed of the SRK pit design pre-feasibility reports and an update to the economic pit shells may be warranted given changes to metal price and exchange rate.*

- *The cash flow forecast review showed that positive project economics support conversion of mineral resources to mineral reserves. A sensitivity analysis indicated the NPV remained positive in all cases tested, suggesting robust project economics.*

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TABLES

FIGURES

2.0 MANITOBA OPERATIONS

2.1 Location

The Manitoba Operations (MO) is located in northern Manitoba, 800 km north of Winnipeg and adjacent to the City of Thompson as illustrated on Figure 2-1.

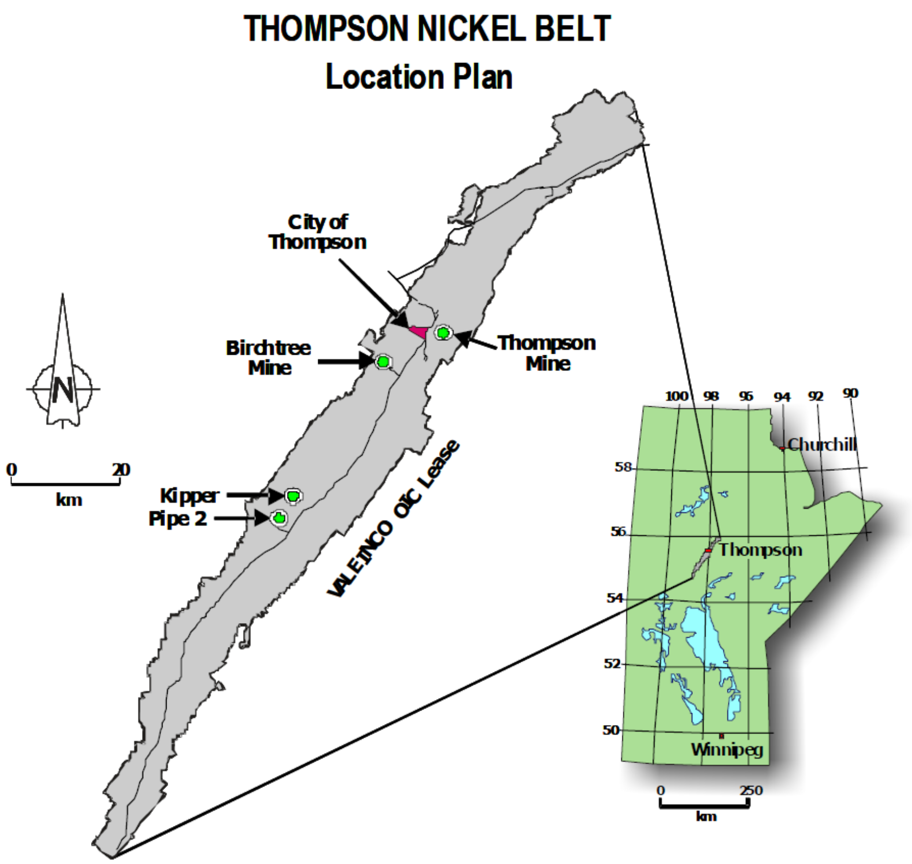

Figure 2-1: Location of the MO and Mining Leases

2.2 Ownership

The MO is 100% owned by Vale Limited (Vale), other than the Order-In-Council (OIC) Leases held by Mystery Lake Nickel Mines, in respect of which no mineral reserves or mineral resources are being reported.

2.3 Land Tenure and Mining Rights

Vale landholdings or mining rights in Manitoba consist of OIC Leases, Mining Leases and Mining Claims. The mineral reserves, mineral resources are located on the OIC Leases and Mineral Leases that are held 100% by Vale.

Order-in-Council (OIC) Leases

Vale currently holds a total of 2,947 OIC Leases in the Thompson Nickel Belt (TNB). A total of 2,918 of these leases are held 100% by Vale. A total of 29 OIC Leases are held in the name of Mystery Lake Nickel Mines (MLNM), which is owned 82.6% by Vale and 17.4% by Newmont Exploration of Canada.

OIC Leases were initially surveyed and made effective over a six-year period from 1957-1962 and are collectively considered “producing leases” as long as production occurs from any single lease in the group. OIC Leases provided for an initial 21-year term and two subsequent guaranteed renewals of 21 years each. All third-term 21-year guaranteed renewals of the OIC Leases have now been granted. Subsequent lease renewals beyond the three 21-year terms can be granted at the discretion of the Province of Manitoba’s Minister of Science, Technology, Energy and Mines.

The 2,947 OIC Leases (6,358 Claims) that cover 109,043.3 hectares in the TNB are listed in Table 2-1.

Table 2-1: OIC Leases

Expiry Date	Hectares	Held in Name Of	Property
January 2020	2854.49	Vale Inco Limited	Thompson Belt North
February 2020	379.52	MLNM	Thompson Belt North
January 2021	108.59	MLNM	Thompson Belt North
January 2021	3399.40	Vale Inco Limited	Thompson Belt North
September 2022	21763.93	Vale Inco Limited	Includes Thompson and Birchtree Mines
September 2023	19772.02	Vale Inco Limited	Thompson Belt North
September 2024	29092.03	Vale Inco Limited	Thompson Belt East including deep extension of Thompson Mine
September 2025	31679.32	Vale Inco Limited	Thompson Belt South
Total			

Mineral Leases

A Mineral Lease is a lease issued by the Province of Manitoba under the Mines and Minerals Act (Manitoba) and conveys to the lessee the exclusive right to the minerals (other than quarry minerals) that occur on or under the land covered by the lease and access rights to erect buildings and structures (including shafts) to mine within the limits of the lease. Mineral Leases are 21-year leases that are renewable at the discretion of the Province’s Minister of Science, Technology, Energy and Mines. Vale holds six Mineral Leases that cover 4,151.21 hectares in the TNB. These Mineral Leases remain in effect until April 1, 2013 and are illustrated summarized in Table 2-2 and illustrated on Figure 2-2.

Table 2-2: Mineral Leases

Lease	Hectares	Property
ML10	774.47	Hambone N.
ML11	711.81	Hambone S.
ML12	789.54	Mystery N.
ML13	564.94	Birchtree
ML14	637.78	Birchtree
ML15	672.67	Birchtree
Total	4,151.21	

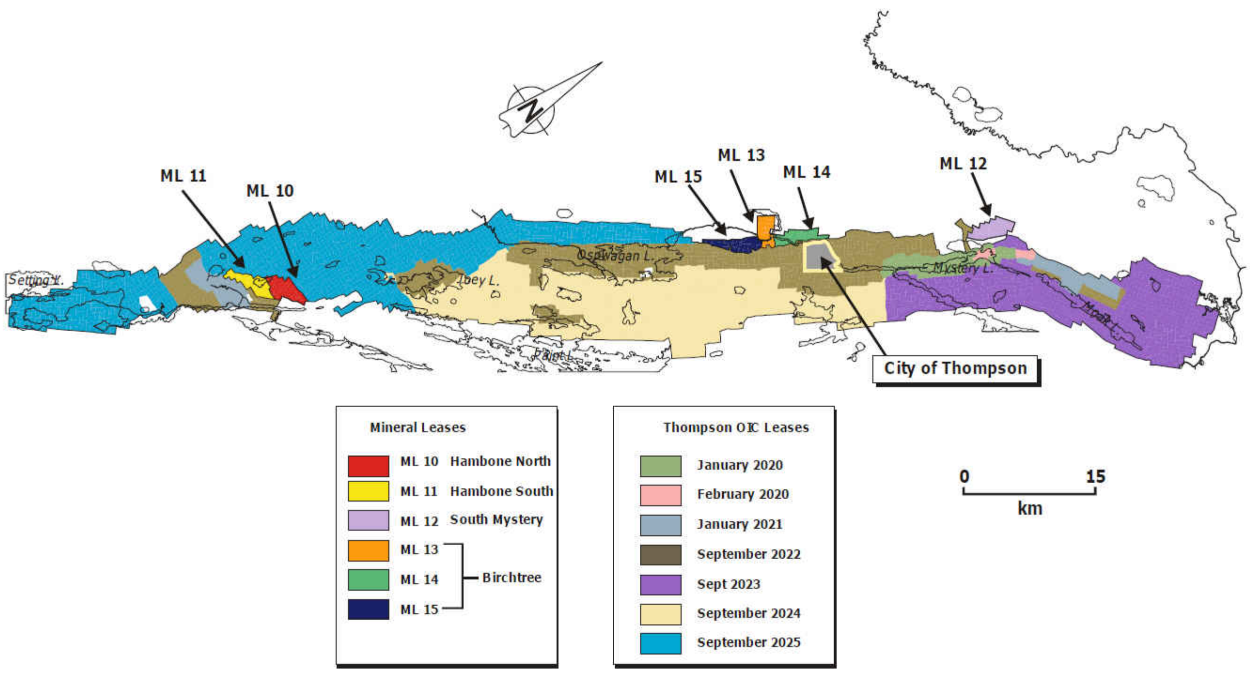

Figure 2-2: Location of the OIC Leases and the Mineral Leases at the MO

Thompson Mine

All OIC Leases that cover the current extent of the Thompson Mine were successfully renewed in 2001 for a 21-year term and will expire in 2022. The eastern and depth extensions of the Thompson Mine are covered by OIC Leases that were renewed for the third 21-year term in 2003 and will expire in 2024. Annual Rentals of CDN $10.50 per hectare (with a minimum payment of CDN $193) are paid to the Minister of Science, Technology, Energy and Mines to keep the OIC Leases in good standing. Although the estimated mineral reserves are scheduled for depletion by that time, the leases contain inferred mineral resources and potential mineral deposits that are under exploration. If these exploration programs are successful, additional mineral reserves could be developed.

Vale intends to commence discussions with the Ministry of Science, Technology, Energy and Mines in 2010 to discuss renewal of OIC Leases or their replacement with mineral leases under the current Manitoba mining laws. This process will identify issues to be addressed well in advance of expiration of the OIC Leases with the intent of best positioning Vale so that its mining rights are extended to allow it to continue operations well beyond their current expiry dates. If the OIC Leases for Thompson Mine were not renewed or replaced beyond their current expiry dates, the mineral reserves would be reduced by 5.6 million tonnes (approximately) and all reported mineral resource for Thompson Mine scheduled past 2024 would be eliminated.

Birchtree Mine

The Birchtree Mine straddles the boundary between Leases grouped under OIC 1746/56 (to the east) and Mineral Leases under the current Mines and Mineral Act (to the West). The OIC Leases were renewed for a third 21-year term in 2001 and will therefore expire in 2022. The three Mineral Leases at the Birchtree Mine will expire on April 1, 2013. The Birchtree Mine orebodies dip to the west from the OIC Leases, onto the Mineral Leases. Based on current production plans, mineral reserves that are scheduled at Birchtree Mine will not be depleted by 2013 when the 21-year terms for the Mineral Leases expire. The Mineral Leases can be renewed for a further term of 21 years if Vale is in compliance with the lease and the Mines and Minerals Act. Vale is not aware of any issues or defaults which prevent it from renewing the Mineral Leases for a further term of 21 years.

Vale intends to commence discussions with the Ministry of Science, Technology, Energy and Mines in 2010 to discuss renewal of OIC Leases or their replacement with Mineral Leases under the current Manitoba mining laws. This process will identify issues to be addressed well in advance of expiration of the OIC Leases with the intent of best positioning Vale so that its mining rights are extended to allow it to continue operations well beyond their current expiry dates. If the OIC Leases for Birchtree Mine were not renewed or replaced beyond their current expiry dates, the mineral reserves would not be affected and all reported mineral resource for Birchtree Mine scheduled past 2022 would be eliminated.

It is the opinion of QP that renewal of the OIC and Mining Leases will not be an issue since the leases have been renewed by the Manitoba government several times in the past and it is not considered a fatal flaw during this audit.

2.4 Infrastructure

The MO production infrastructure consists of:

- A beneficiation plant;
- A smelter with two electric furnaces;
- A nickel refinery;
- Offices and services facilities; and
- Areas designated for tailings disposal, slag disposal and settling ponds.

Electric power is provided by Manitoba Hydro.

2.5 Production Process and Products

Mine production is sourced from two underground mines: the Birchtree Mine; and the Thompson Mine. Mining methods primarily use Vertical Block Mining (VBM), a Slot-Slash Method, with vertical blocks averaging 100 ft in height, and Cut and Fill mining. The ore is crushed underground to -15 cm and shipped to the concentrator.

At the concentrator, the ore is crushed and ground in cone crushers, rod mills and ball mills and fed to the froth-flotation cells. The multi-staged froth flotation separates the sulphide minerals into a nickel concentrate and a copper concentrate. Pyrrhotite is not separated. The tailings are disposed of in tailings ponds and are also placed as fill underground. Approximately 1/3 of mill feed is available for use as fill underground. The nickel concentrate averages 14% Ni and 0.4% Cu. The copper concentrate averages 13% Cu and 4% Ni.

The copper concentrate is filtered and shipped to the bulk smelter at the Sudbury, Ontario operations. The sulphide anode slimes from the nickel refinery is filtered and sold. The sulphide anode slimes grades about 8% Ni and 1% Cu and contains precious metals.

The nickel concentrate is dewatered and upgraded to Bessemer Matte by processing through fluid-bed roasters, electric furnaces and Pierce-Smith converters. The Bessemer Matte is cast into anodes grading 76% Ni and 2% Cu.

The nickel refinery is electrolytic. The nickel anodes are dissolved producing an electrolyte (“anolyte”) containing primarily nickel, but also significant amounts of copper, cobalt and iron. The anolyte is purified in several stages to produce “electro-nickel” at a purity greater than 99.9% Ni.

A copper cake grading about 34% Cu and 13% Ni is also produced from the purification of the anolyte.

There is currently no restriction on the export of the products from the MO’ mines for treatment or refining outside of Canada.

It is the opinion of QP that the production processes at the MO are well understood and is successful generating products for Vale. The level of review completed by the QP was based on document reviews and has not identified and fatal flaws.

2.6 Metal Recoveries

The mill metal recoveries of nickel, copper and cobalt that are used for mineral reserve estimates are calculated as a function of the mill head grade. The recovery formulae are updated annually by comparison to actual mill operating results.

Recoveries of nickel and cobalt at the smelter and refinery are determined as factors based on the recoveries used in the Operations’ current metallurgical plan, which are generally based on results from the previous two years.

The copper recovery is based on factors from the recovery of copper at the Ontario Operations’ smelter and refinery.

The precious metals recoveries are determined as factors based on mill recoveries and the smelter and refinery recoveries.

The overall metal recoveries for Birchtree and Thompson Mines based on 2010 average plan grades are shown in Table 2-3.

Table 2-3: Average Recoveries for Major Metals at the MO (Based on 2010 Average Plan Grades)

Metal	Birchtree Mine	Thompson Mine
% Nickel Recovery	80.3	83.9
% Copper Recovery	73.8	76.6
% Cobalt Recovery	44.8	44.5

It is the opinion of QP that metal recoveries at the MO are well understood and are appropriately applied to the mineral reserve estimate. The level of review completed by the QP was based on document reviews and has not identified any fatal flaws.

2.7 Market

The nickel is sold as nickel “rounds” or cathodes (“slabs”). Most is sold to the plating industry and the remainder is sold to the melting industry. These products account for about 97% of the recovered nickel production at the MO.

The copper concentrate and copper cake are shipped to Vale’s Ontario Operations. The copper is refined and sold as anodes. The nickel in the copper products accounts for the remaining 4% of the recovered nickel produced at the MO.

Cobalt is produced in the hydrate form and is sold directly to market as a hydrate.

The MO ore contains about 0.5 grams per tonne platinum group metals and gold. The precious metals are collected in the sulphide anode slimes and sold to market.

It is our understanding from Vale that they have well established markets available for all products.

It is the opinion of the QP that the metal market at the MO is well understood and is appropriately applied to the mineral reserve estimate. The level of review completed by the QP was based on document reviews and has not identified any fatal flaws.

2.8 Historic Production

Table 2-4 shows mine production and the average grade for MO for the three-year period to 2009 (year-end) and is based on information provided from the Form 20F 2009 SEC filing. Production from 1H 2010 (June 30, 2010) is also included for comparison.

Table 2-4: Historic Production - 2007 to June 30, 2010

Area	Units	2007	2008	2009	1H 2010
Production Thompson					
Tonnage	('000 tonnes dry)	1,380	1,320	1,270	745
Nickel grade	(%)	1.83	1.77	1.98	1.68
Production Birchtree					
Tonnage	('000 tonnes dry)	1,164	971	769	439
Nickel grade	(%)	1.52	1.51	1.48	1.38
Production MO					
Tonnage	('000 tonnes dry)	2,544	2,291	2,039	1,174
Nickel grade	(%)	1.69	1.66	1.79	1.57

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Table 2-4 indicates consistent production levels at Thompson Mine over the past five years with a downward trend in production at Birchtree Mine. The upward trend in 2009 for the Thompson Mine head grade can be attributed in part to a production shift to the higher grade selective mining 1D Lower area. Birchtree head grades have remained relatively consistent from 2007 to 2009. The downward grade trend in the Birchtree Mine was due to remaining ground stability issues from a flattened mining front. Block selection was limited and the transition to a more optimal mining sequence will reduce ground stress.

Discussion with Vale regarding the grade trends for the first half of 2010 for the Thompson Mine has been attributed to mining lower Ni grade production areas. The grade is projected to recover in the final half of the year and the final grade for 2010 will be close to the three-year average grade. The 2010 tonnage production is expected to be similar to 2009. The grade trend for the first half of 2010 for the Birchtree Mine has been attributed to mining lower Ni grade production areas. The grade is expected to recover and average approximately 1.5% Ni in the final half of the year. This will result in the 2010 Birchtree head grade being slightly less than the three-year average. Birchtree Mine tonnage production is rising and 2010 is expected to be better than 2009, nearing 2008 production numbers.

Head grade was also negatively affected by the mill credit grades. There is a 7% discrepancy between Mine called (estimates provided by the geology staff on a daily basis) and Mill credit grades. Issues related to sampling procedures at surface feed and discharge points have been identified. Some of these issues have been addressed in 2009. The remainder will be acted upon in 2010. The goal is to reduce the Mine - Mill discrepancy.

The MO mine plans are based on long-term corporate nickel price projections. Individual block economics are assessed immediately prior to mining based on shorter-term nickel prices and actual mining costs. The upturn in the Ni selling price in 2007 and the first half of 2008 increased the value of the ore and in many cases effectively lowered the cut-off grade in several areas. The MO are, however, constrained by a requisite Mill Head Grade.

It is the opinion of QP that the Historic Production at the MO is well documented and is appropriately applied to the mineral reserve estimate where applicable. The level of review completed by the QP was based on document reviews and discussion with Vale staff and has not identified any fatal flaws.

2.9 Geology and Mineral Deposits

Regional Geology

The Thompson Nickel Belt (TNB) consists of a series of early Proterozoic metasediments, referred to as the Opswagan Group, which have been intruded by ultramafic intrusions. The sediments and ultramafic intrusions have been metamorphosed and interfolded with Archean Gneisses, forming a “dome and basin” type structural setting.

Local Geology

The Ospwagan Group has been divided into a series of formations which is illustrated on Figure 2-3. The basal Manasan Formation consists of two members:

The lower member (M1) consists of impure quartzite to arkosic arenite, locally with small lenses of pebble conglomerate that unconformably lie on top of basement Archean gneiss. It is usually fine to very fine grained, light grey to beige and thinly bedded to laminated.

The upper member (M2) is usually between 3 and 65 ft (0.9 to 19.8 m) thick and consists of quartz-feldspar-muscovite-biotite schist derived from an arkosic wacke. It also has much more argillaceous material than the M1.

Overlying the Manasan Formation is the Thompson Formation. The transition is gradational from semi-pelite dominated to thinly layered calcareous metasediments. It usually shows thin compositional layering and consists of a mixture of dolomitic carbonate, siliceous dolomitic marble and chert, with some intercalated semi-pelites.

The next formation in the sequence is the Pipe Formation. This unit hosts the nickel bearing sulphides and comprises three units:

The P1 member consists of laminated to thinly bedded chert, graphitic pelite schists and sulphide facies iron formation. Pyrrhotite, the primary sulphide, is present as laminations or layers, up to 1 ft (0.3 m) thick.

The P2 member overlies the P1 and consists of pelitic schist, commonly with porphyroblasts of garnet, staurolite and sillimanite. Thin beds of chert and calc-silicate are typically intercalated with the schist. Sulphide, typically as fine-grained disseminated pyrrhotite, is common through out, as is graphite. All economic mineralization is contained within the P2 member.

The P3 member is upper-most in the sequence and consists of silicate facies iron formation. The primary constituents are quartz, biotite, garnet, grunerite, cummingtonite, hornblende, clino- and ortho-pyroxene, fayalite, carbonate and magnetite. A dolomitic marble unit is intercalated with the iron formations. Quartz is present primarily as recrystallised chert. The chert is thinly to thickly laminated and is commonly disrupted due to tectonism.

Above the Pipe Formation is the Setting formation. It consists of thickly layered intercalated quartzite and pelitic schist. Calc-silicate lenses are common and may represent metamorphosed carbonate-rich concretions.

The upper most unit of the Ospwagan Group is the Bah Lake Formation. It consists of mafic volcanic flows and fragmentals. It varies from basalt to olivine basalt (picrite). Pillows are a common feature.

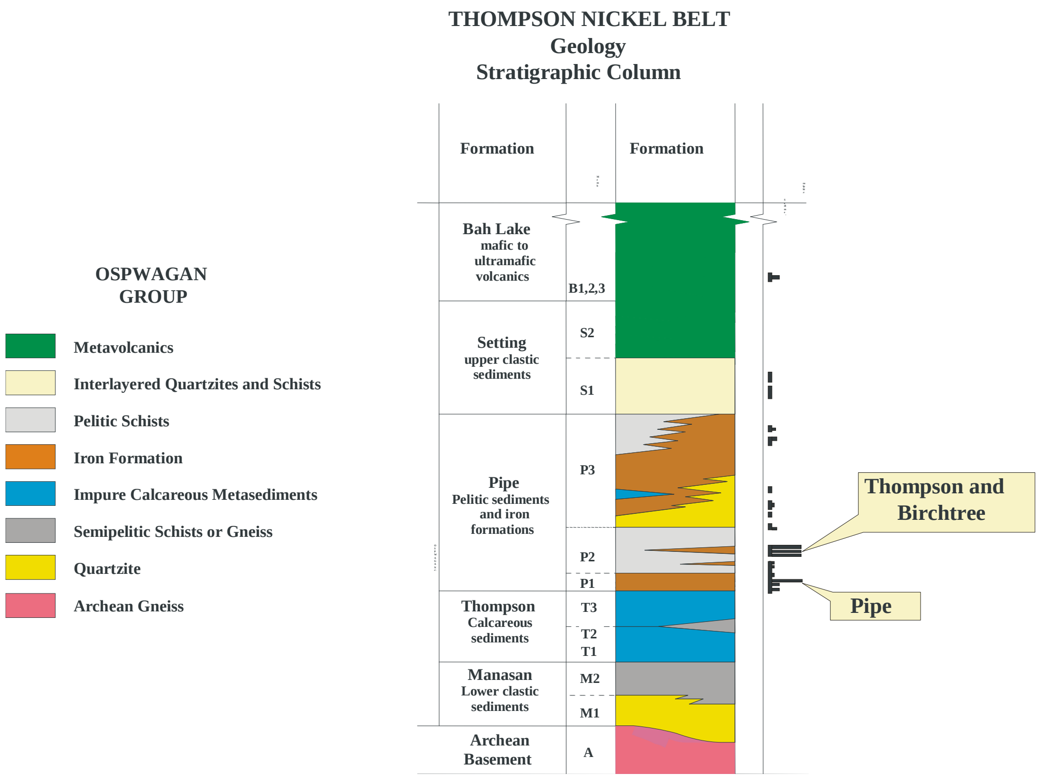

Figure 2-3: Stratigraphic Lithology Column TNB

Structural Geology

The Early Proterozoic Ospwagan Group cover sequence is preserved within a deeply dissected remnant of regional fold interference patterns reflecting a complex deformational history. There have been at least six phases of folding, of which two (F1 and F3) are the most significant. The first phase of folding (F1) has resulted in large-scale recumbent synformal folds. These have been refolded by tight, upright, doubly plunging F3 folds producing at times complex fold interference patterns.

The nickel ores are typically hosted within the P2 formation of the Ospwagan Group. Ultramafic bodies associated with the ore show variable degrees of disruption and boudinage with the sulphide mineralization typically wrapping around the ultramafics.

Much of the western contact of the main synformal fold structure has been affected by shearing associated with a mylonite zone that follows along this contact. Most of the basal stratigraphic units (Manasan to Thompson Formations) have been thinned and attenuated to the point that in many places they can no longer be recognized. Mineralization has remobilized into this shear zone and now extends well past the limits of the ultramafic bodies.

At the Thompson Mine zones of wide and high-grade mineralization are spatially correlated with dilation zones within multiple faulted/drag folded flatter lying stratigraphic sequences within P2. The ore occurs as distinct semi-massive sulphide breccias within these faulted zones as:

- Semi-conformable en echelon and anastamosing sub-vertical vein sets; and
- Flatter lying veins that have infilled dilatant drag folds.

These dilation zones occur at all types of scales, from true widths exceeding 300 feet (100 m) to microscopic scale. Massive sulphide occur locally and less frequently at varying orientations within tension gashes.

Late brittle structures do occur at Thompson Mine but are usually narrow and have limited strike length. Although they can have a negative affect on local ground conditions, they rarely affect the ore zone geometry. The exception is the large brittle 1D fault system that is locally referred to as the Davy's Fault. It is prevalent within the Pipe formation in the 1D upper and portions of the 1D lower orebodies. In general, the fault crosses the ore zone at a very shallow angle from the south west or in several locations parallels the ore. Depending upon orientation and host rock type the fault can range from a vuggy quartz – carbonate breccia zone up to 100 ft (30 m) across down to graphitic shear zones on scale of a few millimetres. The fault zone affects the local rockmass stability and necessitates use of several ground control/support methods to allow for safe extraction of the ore.

At the Birchtree Mine two important fault structures occur:

- Strike- parallel faults in the structural footwall, including the 780 and 1080 Faults; and
- Shallow East - dipping faults including the 906 and 609 faults.

Minor splays associated with these fault structures also occur at the Birchtree Mine, one example is the 84 Shear.

Mineral Deposits

The sulphide mineral deposits are associated with the ultramafic intrusions within the Pipe Formation, which is part of the Opswagan Group. The sulphide deposits occur as disseminated sulphides within the ultramafics, massive sulphide veins and lenses within the ultramafic and along the contact of the ultramafic with the Pipe Formation, and as massive sulphide veins and lenses within the Pipe Formation. All mineral reserves are contained within the latter two deposit types.

The stratigraphy at the Thompson Mine is overturned and dips 65 degrees to the west. The Archean Gneisses are located in the Thompson Mine hanging wall. Unconformably overlying the gneisses are quartzite, schist, nickel mineralization, calcareous marbles and iron formation. Amphibolite dykes and pegmatites crosscut all lithologies. Ultramafic bodies (locally called peridotite) are associated with the nickel mineralization in areas of Thompson Mine. The majority of sulphide mineralization at the Birchtree Mine is Ultramafic Associated Deposits.

Deposits are generally classified as to their spatial relationship of the mineralization to ultramafic bodies:

Metasedimentary Hosted Deposits

The structurally controlled dilation sulphide matrix mineralized zones are contained within the P2 Schist. Inclusions of wall rocks and ultramafics are common in the massive sulphide. The mineralization is linear and more predictable with widths ranging from 0.3 m to 60 m. Pinch and swell structures are common. The majority of Thompson Mine orebodies fall in under this category.

Ultramafic Associated Deposits

The sulphide mineralized zones tends to concentrate between the footwall or hanging wall rocks and the ultramafic, although it is not uncommon for the ore to completely encompass the ultramafic. The Birchtree Mine 84 Orebody can generally be described as brecciated ultramafic within a sulphide matrix. The ultramafic inclusions, which are randomly distributed, range from centimetres to hundreds of metres in size.

At Pipe 2, mineralization consists of ultramafic associated disseminations, net textured sulphides, semi-massive segregations, and as semi-massive to massive veins and breccias. The sulphide zones extend along strike and dip from the ultramafic host into sediment hosted veins, pods and lenses of massive and breccia sulphide.

Sulphides

The massive sulphides contain inclusions of ultramafics and sediments. On average, massive sulphide consists of 90% pyrrhotite, 10% pentlandite and less than 1% chalcopyrite. Cobalt is contained within the pentlandite.

Thompson Orebodies

The Thompson Mine comprises the following orebodies and are illustrated on Figure 2-4.

- 3-Shear - The 3 shear orebody is located along the Thompson #3 zone. The 3 shear orebody extends from surface to a depth of approximately 1,600 ft (488 m). Mineralization within the zone is predominantly hosted by large ultramafic bodies. This was one of the first areas to be mined at Thompson and still has potential for future remnant mining.

- 2-3 Nose - The 2-3 Nose is a south plunging, north fold closure located just east of 3 Shear orebody. This area has been mined down to 3600 Level with current remnant mining taking place between 3200 Level and 2800 Level. Mineralization is proximal to the setting formation contact but is generally confined within the P2 schist with local ultramafic inclusions. It can be attributed to the infilling of dilation zones around an F2 fold closure.

- 2 Shear - The 2 Shear orebody is a sub-vertical northwest/southeast striking zone on the south end of the Thompson Dome structure. The 2 Shear orebody is the connection between the 2-3 Nose and the Nose orebodies. Mining has taken place from surface to a depth of 4,550 ft (1,387 m). Current activities include primary mining in the South End Development (SED) from 4550 to 4050 Level and remnant mining of the 3200 – 234 complex and 2000 Crowns. Future mining opportunities exist as primary mining of the SED below 4550 Level and other remnant areas.

- Nose - The Nose structure is the south-eastern most portion of the Thompson Dome. It consists of a south plunging, south fold closure. Mineralization is a result of infilling of a dilation zone around the fold closure. The orebody has been mined from surface down to 4000 Level. Mineralization continues below 4000 Level but not enough ore grade material has been outlined to make it economic to pursue. Remnant areas above 4000 Level are in the Thompson LOM plan.

- 1A - The 1A Zone is the southern most orebody located entirely on the eastern limb of the Thompson Dome. The 1A Zone is a south plunging orebody located within P2 schist. The 1A orebody has been mined underground from 400 Level to 3600 Level. Mining of the 1A orebody in the TOP is ongoing. There are also potential remnant recovery areas in the 1A orebody.

- 1B - The 1B orebody is located on the eastern limb of the Thompson Dome, just north of the 1A. The orebody can essentially be divided up into two areas based on both mining activities and mineralization. The 1B orebody above 2400 Level is sediment hosted within the P2 schist with minor ultramafic inclusions. This area has essentially been mined out with only a few remnant areas remaining. Below 2400 Level, the orebody becomes ultramafic associated as the ore tends to wrap around large peridotite bodies. This is a primary mining 2802 complex, and is currently being bulk mined between 3100 and 2400 Levels.

- 1C - 1C orebody is centred around the T-3 shaft. It is essentially mined out between 400 and 3300 Levels with a few remnants left. Diamond drilling has cut the orebody off at 3300 Level. South of the T-3 shaft most of the crown pillar ore, above 400 Level has been extracted via open pit. The crown pillar adjacent to and north of the T-3 has recently been the subject of a new open pit study. It is economic to mine the area via open pit but timing of the project is critical because of its potential affect on the T-3 shaft and surrounding infrastructure. The mineralization is locally associated with ultramafic bodies but is usually referred to as sediment hosted deposit. The ore in the 1-C complex below 2400 Level was the result of sulphide infilling of a large dilation zone adjacent to a F2 fold closure.

- 1D Upper - The 1D orebody is located north of 34500N and is currently a primary mining area. The 1D Upper mining area extends from 3500 Level up to 2400 Level. The area above 2400 Level is currently being evaluated for potential future mining operations. The near surface material is currently being assessed to determine if it is possible to extract it via open pit. The 1D Upper orebody is overall a linear east dipping structure contained within P2 schist. Mineralization is generally associated with shearing within the P2 schist creating zones of weakness that were conducive for the migration of ore bearing fluids.

- 1D Lower - The 1D Lower orebody is located below 3500 Level and is open at depth. This is a primary mining area and is currently being mined with mechanized Cut-and-Fill methods. The 1D Lower orebody is developed in dilation zones around F2 fold hinges typically below synformal closures (“hang-downs”) in the Thompson Formation skarn, which caused a deflection of the P2 shear zone.

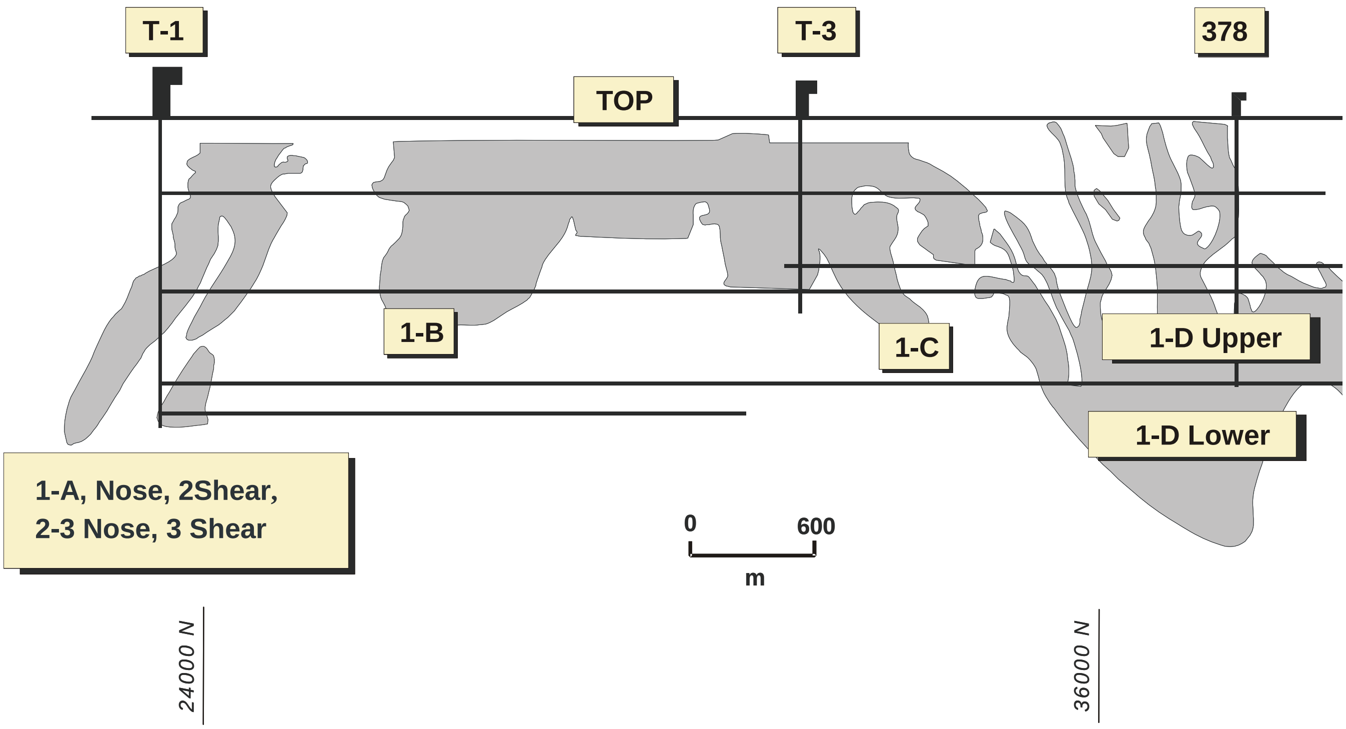

Figure 2-4: Thompson Mine Longitudinal Section

Birchtree Orebodies

The Birchtree Mine comprises the following orebodies and are illustrated on Figure 2-5.

- 84 – The 84 orebody is a breccia which wraps a large ultramafic. It is at the south end of the mine. The ore is located on the footwall side of the ore. The ore zone is up to 300 ft (100 m) wide. The south side of the ultramafic generally has higher grades than the north end. The orebody has been truncated and displaced by the 609 and the 906 faults. This orebody is the major producer at Birchtree Mine. The orebody has been mined out above the 906 fault.
- 85 – The 85 orebody is the down-dip extension of the 84 Orebody below, and offset by, the 609 Fault. It is also hosted in ultramafic.
- 108/109 – The 108/109 is a linear shear structure that ranges in width from 10 to 60 ft (3 to 18.2 m). There is a change in direction in the orebody that creates a widening of the ore zone. The grade increases around the bend and to the north of the change of direction.
- 124 - The 124 orebody wraps the northern ultramafic. The ore is interstitial through the edges of the ultramafic. It is 20 to 200 ft (6.1 to 61 m) wide. It has a higher grade than the other ultramafic ore deposits within the mine. This orebody has been mined up to 30 ft (9.1 m) below 300 Level.

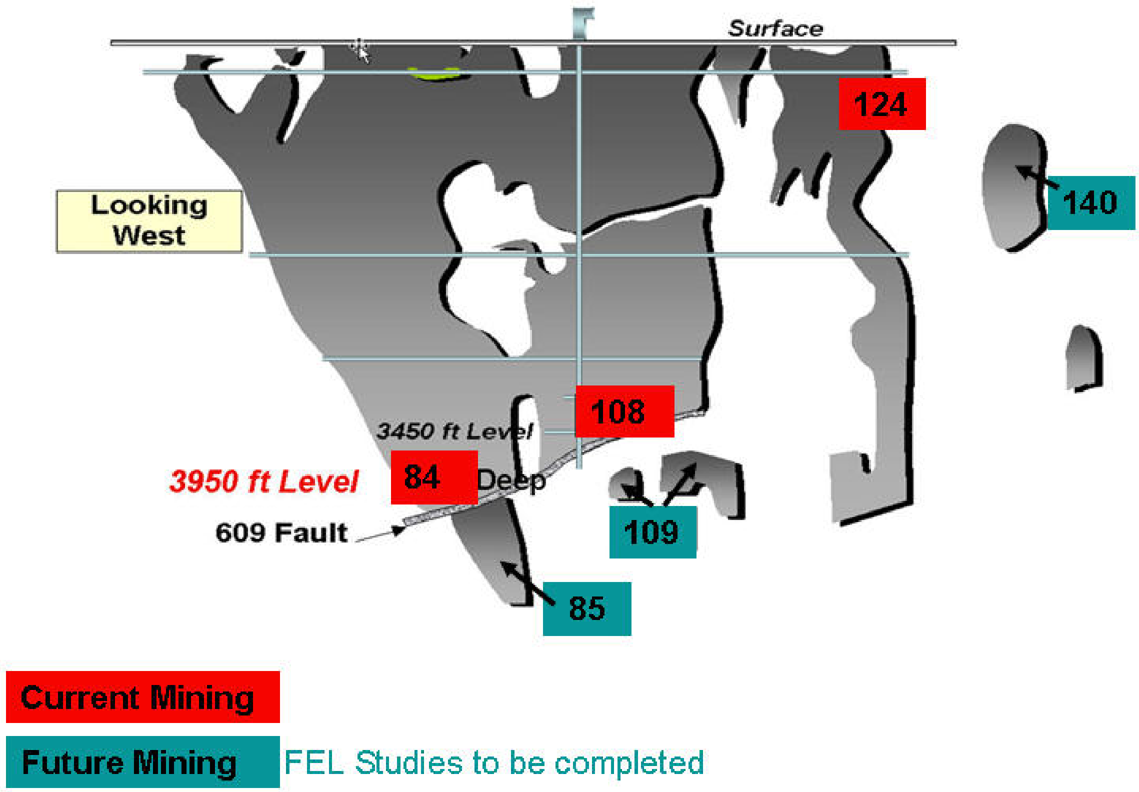

Figure 2-5: Birchtree Mine Longitudinal Section

PGE Mineralization

Recent exploration data from the 1D Lower orebody at Thompson Mine indicates elevated platinum group element levels associated with remobilized, metasediment hosted, sulphide ores. The evaluation of the PGE potential of the TNB is now a part of Vale exploration approach. Several studies are currently underway to better understand PGE mineralization and distribution within ultramafic associated and metasediment hosted sulphide ores.

A positive Pd to Ni correlation exhibited in the 1D Lower data is beneficial in identifying and quantifying the potential PD resource within current ore zones. Data acquisition and evaluation of the PGE potential of metasediment hosted 108 and 109 Orebodies at Birchtree is currently underway.

Geology and Mineral Deposit Review by Golder

A presentation of the background geology and mineral deposits in the TNB was provided to Golder by Robert Stewart, P.Geo., the Chief Geologist of Vale Inco Technical Services (VITS). In addition, discussions were held with the chief geologists and mine geologists from each of the operations with respect to the geology and mineral deposits of the TNB.

The stratigraphy of the TNB and the structural controls of mineralization have been well established by government and Vale geologists.

The main data collection method used in evaluating and increasing confidence in geological interpretation and mineral resource evaluations is diamond core drilling directed by the exploration and mine geological staff. Drilling density varies at the mines and is a function of the style of mineralization and the level of resource classification.

In addition to the diamond core drilling used to define the mineral resources and mineral reserves, once the mineralized zones are intersected underground, geology mapping is completed typically on a round-by-round basis at the mines and intergraded into the Vulcan and Datamine geology models. The mapping is compared against the exploration and development drilling data to better define the reserve planned for mining. Where historical mapping data exists, it is also relied upon when working in remnant mining areas and compared against more recent drilling. In addition, probe data from production drilling (in Vertical Bench Mining (VBM) mining) is completed to define the mineralized contacts in the planned mined areas and adjusted to minimize dilution or identified missed mineralized zones.

Reviews of the MRMR documents provided for each mineralized zone (or orebody) indicates local geology controls that may be relevant to that zone and how it may impact the reserve and production planning. This information is shared with the mine planners for these zones and in some cases identifies the requirement of additional data (detailed mapping and additional drilling).

Also, senior geology staff (Chief Mine Geologists) have experience at several of the mines and recently rotated between the mines allowing for opportunities to share knowledge and best practices. It is also noted that all development drilling data at the three mines is currently collected by the same geologists and technicians, which permits geology logging consistency between the mines. It is Golder's understanding that the majority of the development drilling for the three mines was completed by the same geologists.

It is the opinion of the QP that Vale has excellent knowledge and understanding of the geology and mineral deposit styles at both the Thompson and Birchtree Mines and this knowledge is being transferred to staff. The level of geology data being collected is completed to accepted industry standards and appropriate for mineral reserve reporting. The level of review completed on geology and mineral deposit styles by the QP did not identify any fatal flaws.

2.10 Exploration and Development Drilling

Two categories of drilling are employed at the MO. Exploration drilling is the identification of new mineral resources and development or definition drilling is the upgrading of information from mineral resources to mineral reserves.

Exploration drilling from surface is under the direction of Exploration TNB and exploration drilling underground under the direction of Exploration TNB and the mine geologist (Thompson Mine or Birchtree Mine). Development drilling underground is under the direction of the mine geologists.

Diamond drilling core sizes are typically BQ and AQTK. NQ drill holes are completed in areas planned for probe geophysics. Drilling is primarily completed by contractors (Major Midwest Drilling) and one underground Vale drill.

Drilling completed between January 1 and December 31, 2009 for the MO as described in the MRMR reports are 45 exploration drill holes for a total of 3,856 m and 422 development drillholes for a total of 42,998 m. Drilling details per mine area are outlined in Table 2-5.

Table 2-5: MO Diamond Drilling (January 1 to December 31, 2009)

Mine Area	Exploration		Development		Total	
	No. Drill Holes	Length (m)	No. Drill Holes	Length (m)	No. Drill Holes	Length (m)
Thompson Mine 1 D Above 3600L	-	-	30	5,182	30	5,182
Thompson Mine 1 D Above 3600L	24	11,430	50	9,144	74	20,574
Thompson Mine T1/T3	-	-	180	9,144	180	9144
Thompson Mine Open Pit	9	972	-	-	9	972
Birchtree Mine Ultramafic	-	-	148	17,096	148	17,096
Birchtree Mine Sedimentary	12	3,856	14	2,433	26	6,289
Total	**45**	**3,856**	**422**	**42,998**	**467**	**59,256**

Drilling completed between January 1 and June 30, 2010 for the MO, as provided by Vale during the site visit, is comprised of 30 exploration drill holes for a total of 15,187 m and 319 development drill holes for a total of 27,186 m. Drilling details per mine area are outlined in Table 2-6.

Table 2-6: MO Diamond Drilling (January 1 to June 30, 2010)

Mine Area	Exploration		Development		Total	
	No. Drill Holes	Length (m)	No. Drill Holes	Length (m)	No. Drill Holes	Length (m)
Thompson Mine 1 D Above 3600L	-	-	57	5,233	57	5,233
Thompson Mine 1 D Above 3600L	19	10,725	14	2,101	33	12,826
Thompson Mine T1/T3	-	-	130	6,187	130	6187
Thompson Mine Open Pit	-	-	-	-	-	-
Birchtree Mine Ultramafic	-	-	111	12,083	111	12,083
Birchtree Mine Sedimentary	11	4,462	7	1,582	18	6,044
Total	**30**	**15,187**	**319**	**27,186**	**349**	**42,373**

The main focus of exploration drilling at the Thompson Mine in 2009 and 2010 is the Thompson Extensions or the 1D Lower area (below 3600 L). All of this drilling is being completed from the 3600 Level hanging wall drift. Surface drilling was also completed in 2009 from surface to investigate the open pits. The main focus of exploration drilling at the Birchtree Mine is the 109 and 85 orebodies both located below the 609 Fault and down dip extensions of the 108 and 84 orebodies. The development drilling focus has been on defining areas to be mined as part of the mineral reserve estimate.

It is the opinion of the QP that Vale's exploration and development drilling programs are under the direct control of the geologists at Exploration TNB and the mines and are completed to accepted industry standards and appropriate for mineral reserve reporting. The level of review completed on exploration and development drilling by the QP did not identify any fatal flaws.

2.11 Deposit Sampling Methods and Data Management

Diamond Drilling Sampling Methods

Vale geologists plan and lay out all diamond drill hole collar locations (hole number, dip, azimuth and length) in Vulcan (Birchtree Mine) and Gemcom/Datamine (Thompson Mine) and provide this information to the drilling crews.

Typical core diameter sizes are BQ with some AQTW and NQ. Core is logged at two facilities at the Thompson Operations: the VITS core facility and the Birchtree core facility. All Exploration drilling is logged at the VITS core facility and all Development drilling from the three mines (T-1, T-3 and Birchtree) is logged at the Central Core Process Centre at the Birchtree Mine. Geologists and technicians (supervised by the geologists) log and sample all drill holes in the same Gemcom database system (MEBS). Sampling procedures are the same for the exploration and development core except that the exploration core is sawed in half with the remaining half retained at Vale's MO core storages sites. Development drill core samples are fully sampled.

There is both an indoor and an outdoor core storage facility. The indoor storage is used to store core that may be affected by the outdoor environment (i.e. peridotie or ultramafic). The indoor core is stored in the old Pipe Thaw shed on the east side of the MO plant. The outdoor storage facility is at the T-2 return air raise site which is north of the main plant on the west shoulder of the Thompson Mine Open Pit. Both areas are within the Thompson Mine / Plant boundary and as a result is restricted to only authorized personnel.

Core received in the core logging facilities are opened and marked by the loggers (geologists and technicians) in imperial units. All core is logged and intersections of sulphide mineralization are identified and recorded by loggers for sampling. Sample intervals are selected based on rock type and estimated percentages of sulphides (%NI). A minimum of one sample is collected on either side of the sulphide mineralized areas. Core to be sawed (exploration drilling) in half have a sample cut line drawn on the core by the logger to guide the sample preparation technicians. Full core and half core from the exploration drill holes are retained and stored at the outside core storage area. Development core is either sampled or discarded if not sampled. Sample sizes vary from a minimum of 3 inches (7.6 cm), but are no larger than 15 ft (4.5 m) and are typically 5 ft (1.5 m) in core length.

Core recovery is typically 99% or higher. RQD measurements are visually estimated per drill run which is typically 10 ft (3.0 m). Currently, bulk density (or specific gravity) values are collected on both exploration and development drill core using the density by water displacement method in the VITS core logging facility. The actual bulk density values collected are compared against linear regression formula derived from Ni metal and other elements analysed. There are several formulas developed depending on the sample assay elements measured.

Samples are shipped to ALS Chemex by Gardewine North Transport (Gardewine) every Thursday to Winnipeg and then transported to Thunder Bay on Friday by Gardewine. Samples arrive at ALS Chemex on Saturday. A sample sheet is sent to ALS Chemex identifying which samples are shipped.

A quality assurance/quality control (QA/QC) sampling protocol procedure is employed at both the VITS and Birchtree core logging facilities. It includes the following components:

- All core logging data is stored in a secure Gemcom custom logging program.
- There is a unique sample number for each sample collected.
- Each sample is weighted prior to shipping.
- Metal tags are placed inside the core box and on the end of the core box identifying the hole id, box numbers and length. Metal tags are only placed on sawed cored and full core from the Exploration drilling and permanently stored on Vale property.
- Wet and/or dry core digital photographs are taken.
- Blank sample and two Thompson nickel standards are inserted in every 100 samples by Vale geologist or technicians.
- Samples are submitted to ALS Chemex in Thunder Bay, Ontario for sample preparation, and analysis is completed at ALS Chemex in Vancouver.

- Coarse duplicates are re-assayed at the request of Vale geologists on a monthly basis. Approximately 3% of all coarse reject samples are re-assayed at ALS Chemex in Vancouver.
- Pulp duplicates are re-assayed at a rate of approximately 2% of all samples. Samples are selected by the Vale geologist in control of QA/QC and sent to SGS in Lakefield.

As part of the audit, Paul Palmer, P.Eng., P.Geo., visited the VITS and Birchtree core logging facilities. During the visit, core logging, core orientation (VITS) sampling, sawing equipment, database entry, bulk density testing (VITS), QA/QC sample inserting, digital photography and sample chain-of-custody procedures were observed or discussed with staff.

It is the opinion of the QP that the core logging and sampling collection methods employed at both the VITS and Birchtree core logging facilities are under Vale control and completed to accepted industry standards and appropriate for mineral reserve reporting. The level of review completed on diamond drilling sampling methods by the QP did not identify any fatal flaws.

Sample Preparation and Sample Analyses

All drill hole core samples are collected in secure facilities on surface and shipped to ALS Chemex Laboratories. Samples from the Manitoba mines (Development samples) and VITS (Exploration samples) are collected and delivered by transport to the ALS Chemex's sample preparation facility in Thunder Bay, Ontario by Gardewine North Transport. Thunder Bay's prep lab can divert the samples to ALS Chemex facility in Sudbury for preparation in instances of a large workload that would delay processing of the samples from MO. All samples from the MO are analyzed by ALS Chemex analytical facility in North Vancouver, British Columbia.

The results of sample prep QC are available to Vale and can be reviewed at ALS Chemex's website. A 100-gram split of the pulp is sent to their analytical facilities in North Vancouver, British Columbia.

Currently, all samples are analyzed for Cu, Ni, Co, Fe, S, As, Pb and Zn using the ME-ICP81 procedure. When requested, CaO, MgO and SiO2 are also reported from the ME-ICP81 package. Any samples with overlimits are re-assayed using quantitative methods for a final result for all elements of interest.

ALS Chemex is an accredited laboratory that conducts rigorous QA and QC inter-laboratory test programs, covering both sample preparation and analysis. Regular internal audits are completed to ensure compliance with documented procedures.

The ALS Chemex internal quality control includes standards, blanks and analytical duplicates. The results of the standards and duplicates from the common analytical packages (ME-ICP81, PGM-ICP23, PGM-ICP27, As-AA45, Pb-AA45, ME-ICP61) are compiled on a monthly basis.

Vale provided Golder four laboratory audits of ALS Chemex facilities in Thunder Bay, Sudbury and Vancouver in 2009 and 2010. During these audits, Vale staff reviewed the laboratory procedures used in sample preparation and analysis. The procedures were then compared against observations of ALS Chemex staff conducting these tasks. Audits of the laboratories are completed on a yearly basis by Vale staff. Golder's review of Vale's memorandum on these audits and discussions with Vale staff indicates that the lab's procedures, facilities, equipment and performance of staff observed during the audits were satisfactory. Any areas of concern identified were addressed by ALS Chemex.

It is the opinion of the QP that the sample preparation and analysis program is well documented, carried out in a systematic manner consistent with the written protocols, routinely audited with recommendations implemented and completed to accepted industry standards and appropriate for mineral reserve reporting. The level of review completed on sample preparation and analysis by the QP did not identify any fatal flaws.

Drill Hole Database

The complete catalogue of borehole logs for the MO and Nickel Belt is stored in digital form and as paper copies. The digital information is stored within a secure borehole database management system known as MEBS (Mines Exploration Borehole System).

The MEBS system is a Microsoft Sequel Server (SQL) database that contains approximately 42,200 boreholes and related engineering holes. The Gemcom Network Edition software is the interface for Geological Database Administrator functionality. This system seamlessly interacts with Gemcom, Datamine, and other SQL/ODBC compliant Windows software, for both geological and engineering related exploration and mining functions.

Both a Vale geologist and a database technician administer the MEBS database functions including security access authorization, assay merging, borehole locking, data integrity, validation, and routine backups. Data validation is completed for all borehole information including header, survey, lithology, assay and structural data.

Golder completed interviews with Glen House and Joan Ledwos, both who monitor the initial data entry and control of the assay data entered into MEBS system. During these interviews, data entry observations, reviews of spreadsheets and QA/QC data entry monthly memos flagging discrepancies and how they are addressed were completed.

It is the opinion of the QP that the drill hole database system employed at the MO is under excellent control and completed to accepted industry standards and appropriate for mineral reserve reporting. The level of review completed on the drill hole database by the QP did not identify any fatal flaws.

Sample Data Validation and QA/QC

Vale has developed a comprehensive QA/QC protocol procedure that was developed by corporate and is currently being implemented by Glen House at the MO with support from Sasa Krstic, Corporate QA/QC person located at Sheridan Park.

All sample assay data, provided by ALS Chemex, is entered into the MEBS database by a dedicated database coordinator (Joan Ledwos). A double entry check system is used. Glen House confirms the monthly data entry by the database coordinator by comparing exports from MEBS to the electronic csv files provide by ALS Chemex in Microsoft Excel spreadsheets (i.e. March Data Validation_final.xls). The sample weight measured by the core logging technicians and the geologist's Ni and S estimates are compared against the actual values provided by ALS Chemex. Significant differences are reported for possible follow-up to determine if there was any sample mix-ups.

The Vale QA/QC program consists of monitoring ALS Chemex's internal quality control samples, monitoring the results of Vale in-house standards and randomly selecting samples for check analysis at third party laboratories (SGS Lakefield), including the Vale control lab. Commencing in 2009 blanks have been inserted into the ALS Chemex shipments. Initially, only the standards were being shipped with the pulp duplicates to SGS Lakefield. In early 2010, MO started shipping both blanks and the two standards (per 100 samples) with ALS Chemex.

Until May 2009, the monthly data validations were performed by the Corporate Chief Chemist (Herb Mackowiak); however, starting in June 2009, the responsibility of the data validation was transferred to MO geologist (Glen House). The QA/QC program is summarized in a document created by Herb Mackowiak (Thompson QA/QC Document, 2009).

Monthly reports of the QA/QC program are completed by Glen House and complied into a single Microsoft Excel spreadsheet (Thompson 2010 Checks.xls). All samples issues are investigated and may require re-assaying or date entry corrections, as required. Samples with issues are not released into the database until fully investigated. QQ and Relative Difference plots are completed for Ni, Cu, Fe, S, Co, As and MgO. A QQ and relative difference plot of Ni grade for the January to March 2010 duplicate data is illustrated on Figure 2-6 and Figure 2-7.

In general, results from external check assays completed by Vale show adequate analytical accuracy and precision during 2008 and H1 2009. The only exception is Co which showed an increased negative bias (partially due to higher detection limit at a check lab) and precision at the 95% confidence level above the contract specifications. Both issues were being followed up with ALS Chemex (Krstic, 2009).

Reviews of 2009 QA/QC data by Vale noted an increasing number of “failures” (those samples where the difference is greater than the expected difference). The majority of the failures stem from the preparation area from what appears to be poor sampling of the crushed sample. Changes to the preparation area have been implemented to minimize the failures (Krstic et al., 2009).

The results of the analytical duplicates (coarse rejects) show precisions that are usually well within the expected value. The analytical duplicates also indicate a higher than acceptable precision for S which suggests that the true detection limit for S is higher than the 0.01% that is quoted by ALS Chemex. The ALS Chemex results are showing minor biases for Cu, Ni, Fe and S in their internal standards. The Cu or Ni bias is not seen in the results from the external checks (Krstic et al., 2009).

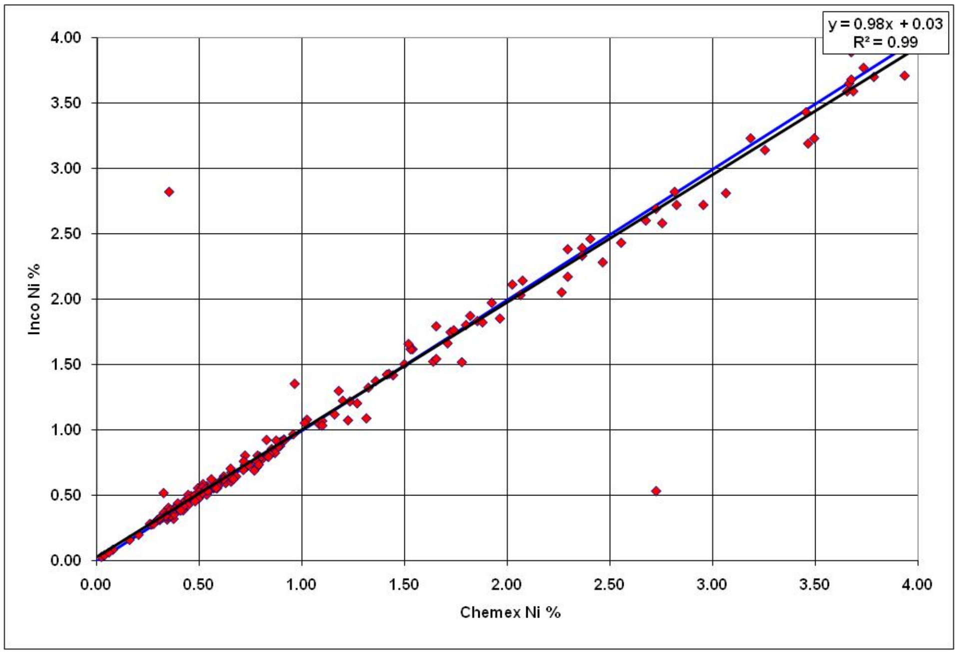

Figure 2-6: QQ Plot of Ni Duplicates - January to March, 2010 (Thompson 2010 Checks.xls)

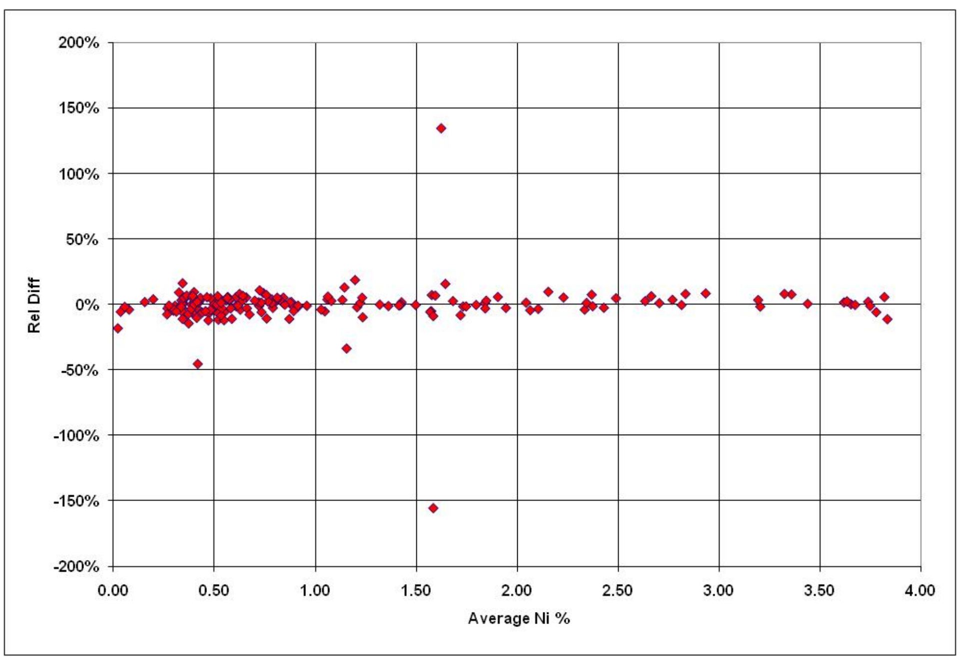

Figure 2-7: Relative Difference Plot of Ni Duplicates - January to March, 2010 (Thompson 2010 Checks.xls)

The standards and blanks recently shipped with the ALS Chemex sample batches have not been compiled yet or plots created. A review of the Microsoft Excel spreadsheet containing the blank data for January to May 2010 (QUU QC for blanks.xls) does not indicate any significant contamination. The standard data shipped by MO in 2010 is still to be compiled by geology staff and has not been reviewed by Golder. A review of previous standards submitted by Vale's Corporate Chef Chemist (Herb Mackowiak) was provided to Golder in a Microsoft Excel spreadsheet (Inco QC External Check.xls). The spreadsheet contains over 20 standards (and over 1,000 assays) used at various times to check for nickel accuracy. There is a minor number of samples that failed (approximately 30 samples in total) but there were no plots or indication of follow-up in the spreadsheet. Based on reviews of audits completed by Vale of ALS Chemex labs, there was mention of issues with respect to contamination and issues related to analyzing Co that have been addressed.

It is the opinion of the QP that the QA/QC program at the MO is being followed and identifies potential errors as intended. Errors when identified are being corrected. There is an internal documentation process showing that the QA/QC sample data is being checked regularly and yearly audits of the analytical labs is being conducted to identify areas for corrected action. The QA/QC program is completed to accepted industry standards and appropriate for mineral reserve reporting. The level of review completed on sample validation and the QA/QC program by the QP did not identify any fatal flaws.

2.12 Mineral Resource Estimation

Mineral Resource Estimation Introduction

The MRMR estimates for the MO are reported once a year (dated December 31). Mineral resources are first developed by the mine geologists familiar with the mining area. The mineral resource is then provided to the mine engineer responsible for the area and the resource is then converted to a mineral reserve after applying appropriate mining factors. If the mineral resource to be converted is an open pit resource, the mine engineering design may have been completed by an external consultant. Not all mineral resources are converted to mineral reserves.

In order to review the mineral reserve statements published by Vale, Golder reviewed the MO mineral resource and mineral reserve estimation methodologies employed at the Birchtree and Thompson Mines. The general estimation methodologies used at the mines are outlined in the MRMR documents completed for Birchtree and Thompson Mines (Proulx and Yamada, 2009 and Mayor and Kelly, 2009) and are published following the National Instrument 43-101 reporting procedure. In addition, individual MRMR reports are generated for each zone estimated by the geologist. In those individual MRMR reports are details on drill hole files, geology models, block model (folded and unfolded), bulk density formulas, estimation parameters and a summary of Datamine Scripts. MRMR reports that were provided by Vale are listed below:

- Thompson Mine 1D Lower FW Deep (G. House, September 2008);
- Thompson Mine 1D Lower South (G. House, May 2008);
- Thompson Mine 1D Lower North HW (B. Bilton, December 2006);
- Thompson Mine 800 Level 3-Shear Remnant Area (H. Davidson, January 2010);

- Thompson Mine 2400 Level North Remnant Area (H. Davidson, October 2009);
- Thompson Mine 234/236 Remanant Area (H. Davidson, May 2009);
- Thompson Mine Mineral Resource Mineral Reserve (A. Proulx and P. Yamada, 2009); and
- Birchtree Mine Mineral Resource Mineral Reserve (T. Mayor and C. Kelly, 2009).

Two types of modelling estimation methods were used in the MO for MRMR reporting:

- Block modelling estimation methods which are completed using Datamine® Studio 2 software, Release 2.1.1633.0. Approximately 89% of the mineral reserves and 99% of the mineral resources were estimated using the Block Modeling method.
- Polygonal estimation methods which were completed using a combination of Excel, Auto-CAD and/or Datamine software.

MO Block Modelling Method

The block modelling estimation method at the MO uses 3D geological interpretation and creation of a mineral envelope that assists with the estimation of the grade and tonnage within a 3D block model that is reported as a mineral resource. The Responsible Person (RP) either supervises or directly conducts the mineral resource estimate (including geological interpretation, model interpretation, grade distribution, etc). A peer or senior review of the block modelling estimate of the mineral zone is completed by a second geologist (Senior or Chief Geologist) throughout the entire process and is documented and signed off as being reviewed.

One of the first steps is the interpretation of the geological data into 3D mineral envelopes. At the MO, the nickel sulphides and the host rocks have been structurally deformed by the same events. The structure and orientation of the host lithologies are interpreted based on the orientation of the host lithologies and subsequent structural deformation. Drilling information is the primary data but is often supplemented with lithological and structural mapping using oriented core measurements and down-hole geophysical surveys. In some instances, early in the exploration program, cross-hole seismic tomography surveys have been carried out to determine the overall orientation, shape and extent of the mineralization. The 3D interpretation of the mineral envelopes is visually validated in cross-section and plan by the RP. The validation ensures that the mineral envelopes and supporting data conform to the local geological interpretation. This mineral envelope represents the domain affected by the natural mineralization process and is not constrained at this stage by economic criteria such as minimum mining width or cut-off grade.

All relevant data and observations are combined into a 3D geological model for each of the mineralized zones since each zone has its own unique characteristics which requires modifying/adding procedures due to the mineralization type (UM or Sed hosted) or structure. The mineralization models are checked to ensure consistency with the mineralizing process and that the grade has not been overstated by assuming a complex interpretation. In peripheral areas with limited geological information, a consistent criterion for extrapolating the mineral envelope was established (i.e. usually one quarter of the drill spacing).

Specific geological features influencing the orebodies, such as faults and fold axis, are also used to separate mineral domains (envelopes). The faults are modelled separately and are used to define the limit of the modelled mineral envelopes when they are intercepted. These features are typically modelled as 3-D surfaces interpreted from mapping and drillholes.

All mineral envelopes modelled at the MO are constrained by lithology, structure and/or a minimum assay value of 0.20% Ni.

Where necessary, data unfolding (using Datamine) is used to control the spread of the grade along geological trends. An estimation method, which is geostatistically appropriate for the data, is selected (e.g. Multiple Indicator kriging for non-homogenous zones). The checks and validation completed for each of the mineralized zones at the MO for sample selection, sample compositing, statistical and geostatistical characterization of the mineral envelope are based on MO standards and also follow industry best practices. The validation of the final resource model includes visual checks and systematic verification of the absence of global and local bias. In addition, smoothing and volume-variance issues are addressed using standard industry practices. In some cases, simulation models are developed to more accurately account for the short-range variation in the metal grades. Only Vale geologist trained in block modelling estimating validate the block models and external consultants also have previously audited the mineral resource estimation methods. Reconciliation studies of mined-out areas are completed to check the results from the polygonal (nearest neighbour) estimation, and the geostatistical methods used in resource and reserve estimations.

Currently, at the MO, an estimated mineral resource is generally not reported and the block model is used directly for mine planning and reserve estimation. When an estimated mineral resource is reported, the resource cut-off grade is based on the operating costs for mining, processing and marketing the products and a portion of the administration costs. The processing, administration and marketing costs are subtracted from the value of the recovered metal for each block to determine “ore value” before mining. The mining cost, using a selected mining method, is then compared to the value of the metal. A break-even cut-off value is used where the ore value must be greater than the mining cost (including delivery cost to the mill). The ore value determination is based on plant metal recoveries and long-term metal price and exchange rate assumptions. A Net Processing Return Formula (NPR) is used to calculate value.

MO Polygonal Estimation Method

The Polygon Estimation Method used at the MO employ the following steps:

- Standard grade groups and grade-feet criteria are established to identify zoning of the mineral deposit.
- Vein contact angles are used to calculate true vein thickness from drill hole intersections (note that veins with a true thickness of less than 6 inches are excluded from the resource calculation).
- An area of influence, equal to half the distance between drill holes.
- Grades are then assigned to each polygon based on the length weighted average grade of all the vein intersections in each hole.
- Volume is determined by multiplying the total true thickness of the vein intersections by the dip corrected polygonal area. Tonnage is calculated by multiplying the volume of each polygon by the weight-averaged density.

Internal dilution is calculated uniquely for each orebody based on the minimum mining dimensions for the mining method that will be used.

Outlined in Table 2-7 and Table 2-8 are the polygonal parameters for the Thompson and Birchtree Mines.

Table 2-7: Thompson Mine Polygonal Parameters

Domain	Orebody	Longitudinal (L) Sectional (S)	Density Weighting	Dilution Applied	Recovery Applied
1D Above 3600	2400 - 3500	S	Y	Y	Y
	3500 - 3600	S	Y	Y	Y
T1 / T3	T1 - 1A: 800 - 1400	S	Y	Y	Y
	T1 - 1B: 600 - 1400	S	Y	Y	Y
	T1 - 2 Nose 3: 800 - 4000	S	Y	Y	Y
	T1 - 3 Shear: 600 - 1200	S	Y	Y	Y
	T3 - 1C	S	Y	Y	Y
Open Pit	TOP Remnants	S	Y	Y	Y

Table 2-8: Birchtree Mine Polygonal Parameters

Domain	Orebody	Longitudinal (L) Sectional (S)	Density Weighting	Top Cut Applied	Dilution Applied	Recovery Applied
Remnants	300 level 115 OB Crown	S	N	N	Y	Y
	700 level 74 / 96 OB Crown	S	N	N	Y	Y
	900 level 108 OB Crown	S	N	N	Y	Y
	1100 level 102 / 108 OB Crown	S	N	N	Y	Y
	1300 level 108 OB Crown	S	N	N	Y	Y
	2300 level 91 OB Crown	S	N	N	Y	Y

Thompson and Birchtree Block Model Mine Resource Estimates

Data Validation

Drill hole assay data is checked for accuracy by comparing the geologist's grade estimates for each interval to the actual metal assays. Fe vs. Ni and S vs. Ni graphs are plotted in order to see any potential assay problems or outliers. A visual inspection of drill holes on section is completed in order to ensure the reliability of drill hole collar locations as well as information from the down-hole survey. Values for density are also subjected to due diligence and a regression formula is applied based on assayed values of Ni (and any other elements that may be used to calculate density) where the model value is either absent or suspect. Inconsistent data is reported to the database administrator and either corrected or removed before modelling.

Geological Interpretation

All relevant data and observations are combined into a 3D geological model. Specific geological features influencing the orebodies, such as faults and fold axis, are also used to separate mineral domains (envelopes). The faults are modelled separately and are used to define the limit of the modelled mineral envelopes when they are intercepted. The location and extents of these axes are deterministically interpreted from mapping and drillholes. These features are typically modelled as 3-D surfaces.

The most prominent structures present within the Thompson Mine are the thrust fold axes, which occur in the 1D Orebody. The most prominent structures present within Birchtree are the 609, 780, 906, and 1080 Faults and the roll over from 3300 Level to 3075 Level.

Mineral envelopes are constrained by lithology, structure and /or a minimum assay value of 0.20% Ni.

The mineralization models are checked to ensure consistency with the mineralizing process and that the grade has not been overstated by assuming a complex interpretation. In peripheral areas with limited geological information, a consistent criterion for extrapolating the mineral envelope was established (i.e. usually one quarter of the drill spacing).

Sample Selection and Compositing

All the borehole assays located in the mineralized envelope domain are captured. The samples are visually validated to ensure that all samples residing within the mineral domain have been selected. The mineral domain wireframe is adjusted to capture any samples that were missed during the original selection.

A histogram of sample length of the captured samples is plotted to determine the mode and average sample lengths. Samples are then composited according to mode length or average length depending on the sample length distribution in order to reduce the number of calculations required for estimation. The selection of the composite sample length is often a balance between routine sample length and the expected selective mining unit. Generally, 5-foot sample composite lengths are used. The composited lengths for each mineral resource zone for Thompson and Birchtree Mines are outlined in Table 2-9 and Table 2-10.

Table 2-9: Block Model Details Thompson Mine

Domain	Orebody	Composite Length (ft)	Density Weighting	Top Cut Applied	Block Size (ft) (X,Y,Z)
1D Above 3600	1D Upper	5	Yes	No	10x10x10
1D Below 3600	376 Stope[1]	5	Yes	No	5x5x5
	CAR 602[1]	5	Yes	No	5x5x5
	South	5	Yes	No	10x15x15
	North	5	Yes	No	10x15x15
1D Below 4200	Deep HW[3]	5	Yes	No	10x15x15
	Deep FW[2]	5	Yes	No	15x15x15
	North Deep (HW)[4]	5	Yes	No	15x15x15
T1 / T3	T-3 315 Stope	5	Yes	No	10x10x10
	1-B Below 2400L	5	Yes	No	10x15x15
	T-1 Div1	5	Yes	No	10x10x10
Open Pit	1AB	10	Yes	No	10x10x10
	1C	5	Yes	No	20 x 20 x 20
	1D	5	Yes	No	10 x 10 x 10

Notes:

1. Based on Median Simulation model
2. Based on IK block model factored by conditional simulation results for 376 stope and CAR 602 feasability study
3. Based on IK Model (variance corrected to 20x30x30 blocks) within potential wireframe
4. Based on NN model (variance corrected to 30^3 blocks) factored to N. Extension results from Golder PF Study

Table 2-10: Block Model Details Birchtree Mine

Domain	Orebody	Composite Length (ft)	Density Weighting	Top Cut Applied	Block Size (ft) (X,Y,Z)
Ultramafic	Upper 84 OB	05	y	n	10 x 20 x 20
	Mid 84 OB	05	y	n	10 x 20 x 20
	Lower 84 OB	05	y	n	10 x 20 x 20
	85 OB	05	y	n	20 x 20 x 20
	124 OB Crown	05	y	n	5 x 5 x5
Sedimentary	108	05	y	n	10 x 15 x 15

Un-assayed samples are assumed to be waste and assigned a %Ni grade of 0.01 and a default density of 0.089 tons/ft^3.

Data Analysis and Top Cuts

Prior to block modelling, a review of the composite database is conducted. Uni- and bi-variate statistical investigations are carried out for the various elements in the composite database. The database is also examined for outlying values and main statistical parameters. Postings of the sample data is reviewed in order to identify and correct errors in sample spatial locations.

Unfolding

Since the spatial distribution of the mineralization is normally influenced by many controlling factors (such as pre-existing footwall topography, pinching and swelling of the zone, folding and faulting), the actual geological distance rarely coincides with the XYZ Cartesian distance. In order to obtain a proper reference system to measure spatial continuity between samples and interpolate grade distribution, a new reference system normally has to be established. This is accomplished with the Datamine unfold module.

Sample files are unfolded in order to adjust for irregularities in the shapes of most orebodies. Unfolding transforms each sample interval into the unfolded co-ordinate system (UCS) as defined by a set of unfolded strings. Unfolded strings are drawn along the footwall and hanging wall contacts, using the domain wireframe, in either the East-West, North-South or plan orientations and are used to define geological features such as folds, irregular shaped contacts and ore plunges. The unfolded samples are then visually inspected in the YZ plane to ensure that they were unfolded according to the geological interpretation. Unfolding can also help reduce the effects of poorly oriented drill samples on the model.

The unfolded model is validated by comparing the global mean of various values (e.g. Ni) for the unfolded model against the corresponding parameter for a model that has not been unfolded.

Variogram Analysis

The spatial variability between samples is determined with the grade variogram models for each metal (Ni and/or Cu), as well as for density. Pair-wise relative variograms, calculated in the unfolded co-ordinate system, provide the basis for each model.

The anisotropy is tested in the dipping plane of the mineralization and along several plunge axes in the unfolded co-ordinate system. If a plunge to the main mineralization is present, a rotation may be applied to the variography.

The variograms are typical of shear hosted and brecciate mineralization. The elevated nugget, shortened ranges and slight anisotropy of the variograms are supported by underground geological observations (Babulic, 2005 and House, 2005).

To properly weigh the grade by density, the QNi service variable is created (quantity of nickel; QNi = Ni x Density).

The QNi grade variograms are modelled by the linear combination of a nugget effect and a combination of spherical structures up to three, but commonly two. Variogram ranges that represent the majority of the covariance are typically used to define the search ranges and anisotropy ratios of the search ellipse. Summarized in Table 2-11 and Table 2-12 are the variogram search parameters used in the mineral resource estimation for the Thompson and Birchtree Mines.

Table 2-11: Thompson Mine Search Ellipse Dimension (ft)

Domain	Orebody	X (across dip)	Y (along strike)	Z (down dip)
1D Above 3600	Above 2400L	26	100	100
1D Below 3600	376 Stope	30	114	114
	CAR 602 - (FW)	58	138	146
	CAR 602 - (S_FW	48	110	110
	CAR 602 - (S_MID	35	150	150
	CAR 602 - (HW)	48	110	110
	South (HW)	45	120	140
	South (FW)	60	210	220
	North (HW)	42	108	108
	North (FW)	50	160	150
1D Below 4200	Deep (HW)	35	176	176
	Deep (FW)	45	250	210
	North Deep (HW)	32	150	150
T1 / T3	T-3 315 Stope	50	100	100
	1-B Below 2400L	33	100	100
	T-1 Div1	60	180	180
Open Pit	1AB	57	150	140
	1C	20	50	75
	1D	24	93	119

Table 2-12: Birchtree Mine Search Ellipse Dimension (ft)

Domain	Orebody	X	Y	Z
Ultramafic	Upper 84 OB	30	125	150
	Mid 84 OB	67	143	119
	Lower 84 OB	30	125	150
	85 OB	68	135	135
	124 OB Crown	95	50	160
Sedimentary	108	40	120	120

Block Size Determination

Block sizes are chosen based on a combination of diamond drill hole density and the Smallest Mining Unit (SMU) for each mineral domain. The SMU typically represents the smallest blast size, which is a function of the mining method and size of mining equipment used for any given orebody. A range of block sizes are used at MO from as small as 5 ft x 5 ft x 5 ft to as large as 20 ft x 20 ft x 20 ft. The bulk mining methods (VBM) are used throughout the Thompson and Birchtree Mines in the massive ultramafic-associated mineral zones. The cut-and-fill selective mining method is used in the in the 1D Lower Orebody at the Thompson Mine and the narrow vein sedimentary mineral zones at the Birchtree Mine. Summarized in Table 2-9 and Table 2-10 are the block model sizes used per orebody.

Nearest Neighbour Block Model

Samples tend to be preferentially taken from high-grade areas as the drilling strategy focuses on confirming the existence and extent of high-grade mineralization. Declustering of the data through the construction of nearest neighbour (NN) block models is undertaken to determine the relative importance (weight) of each sample.

NN block models are built for all orebodies. The procedure involves the assignment of grade to unique polygons whose volume and dimensions is based on its proximity to the closest sample. If an area is heavily sampled, each sample will represent a smaller volume than in areas where the sampling is sparse. The relative importance of each sample is therefore directly proportional to the volume of material estimated by each sample.

The estimates of tonnage and grade generated by the NN model are preliminary; they represent a global mineral inventory and do not necessarily represent and support a mineral resource. However, they do serve the purpose of checking for global bias at the grade estimation stage.

Interpolation

Multiple indicator kriging (MIK) is the preferred interpolation method for most of the Thompson orebodies, because it is better suited to handle the skewed grade distributions than ordinary kriging (OK).

With the MIK estimation method, samples are divided into grade groups (from the NN model) and the probability of a block grade exceeding each grade group is estimated. An elliptical search volume based on the octant method is used. Search volume dimensions are defined from the variogram models, based on the maximum range of the second or third structure in each direction. Limits are set for the minimum and maximum number of samples used per estimate and as a restriction on the maximum number of samples used from each hole. Any negative kriging weights identified are considered insignificant and are not adjusted. Metal grades are later reconstituted by multiplying the probabilities (from the kriged model) with the mean grade for each grade group (from the NN model).

The Mid 84 Orebody from the Birchtree Mine and the 1D Lower Orebody in the CAR 602 area (3600 – 4200 level, 36800 – 38400 northing) from the Thompson Mine were estimated using conditional simulations. Conditional simulation is considered a reasonable approach for mineral resource estimate in areas with less drilling (i.e. are early exploration areas) and outlines the in situ grade variability and ranges of possible recoverable tons and grade. The median range of tonnage and grade is selected to represent from the conditional simulation. The conditional simulations were conducted using the same mineral domains, and sample database used to construct the kriged block models (including the transformation of the Cartesian distances into "geological" distances using the unfolding algorithm). Summarized in Table 2-13 and Table 2-14 are the geostatistical interpolation methods used at the Thompson and Birchtree Mines.

Table 2-13: Thompson Mine Geostatistical Interpolation Methods

Domain	Orebody	Interpolation Method	Unfolding Used	Variance Correction	Reconciliation
1D Above 3600	Above 2400L	Indicator Kriging	Yes	Log Normal	Y [1]
1D Below 3600L	376 Stope	Conditional Simulation	Yes	NA	Y [2]
	CAR 602	Conditional Simulation	Yes	NA	Y [6]
	South	Indicator Kriging	Yes	Log Normal	N
	North	Indicator Kriging	Yes	Log Normal	N
1D Below 4200L	Deep	Indicator Kriging	Yes	Log Normal	N
	North Deep (HW)	Indicator Kriging	Yes	Log Normal	N
T1 / T3	T-3 315 Stope	Indicator Kriging	Yes	Log Normal	Y [3]
	1-B Below 2400L	Indicator Kriging	Yes	Log Normal	Y [4]
	T-1 Div1	Indicator Kriging	Yes	Log Normal	Y [7]
Open Pit	1AB	Indicator Kriging	Yes	Log Normal	Y [5]
	1C	Indicator Kriging	Yes	Log Normal	Y [5]
	1D	Indicator Kriging	Yes	Log Normal	Y [5]

Notes:

1. Based on 1D bzone analogue reconciliation
2. Based on reconciliation of median simulation to production credit for stope
3. Based on T-3 315 Stope model above 2200 Level to production records and stope mapping.
4. Based on 1B model reconciliation to mill credit
5. Based on 1B pit model reconciliation to mill credit
6. Based on 602 Cut1 production reconciled to original reserve estimate
7. Based on SED model reconciliation to mill credit for mined out portions

Table 2-14: Birchtree Mine Geostatistical Interpolation Methods

Domain	Orebody	Interpolatation Method	Unfolding Used	Variance Correction	Reconciliation
Ultramafic	Upper 84 OB	Indicator Kriging	Y	Log Normal	Y
	Mid 84 OB	Indicator Kriging	Y	Log Normal	N
	Lower 84 OB	Indicator Kriging	Y	Log Normal	Y
	85 OB	Indicator Kriging	Y	Log Normal	N
	124 OB Crown	Simulation	Y	N	N
Sedimentary	108 OB	Indicator Kriging	Y	Log Normal	Y

Model Verification

A number of checks are performed to validate the final resource block models. The first step entails a visual comparison of the continuity and value of grade estimates with near-by known sample points. Significant differences are investigated.

A second validation procedure assesses the presence (or absence) of a global bias in the models. The global grade estimate for the block model should be similar to the global grade estimated from the samples and any discrepancies are investigated and resolved.

A third validation step compares the variance of the block grade distribution obtained by interpolation with the expected variance calculated from the variance of dispersion within the blocks. This variance of dispersion is calculated using the variogram model. If the density of drilling is insufficient for the inherent variability in the orebody, regression methods such as kriging may result in an over-smoothing of the grade variability and produce a block grade distribution with a lower than expected variance. Using an over-smoothed model may lead to conditionally biased estimates of recoverable resource at a given cut-off. The degree of smoothing is referred to as a smoothing ratio.

All Thompson and Birchtree block models from the 2009 mineral resource estimate have had variance corrections applied based on an indirect lognormal correction (Isaaks and Srivastava, 1989).

Thompson and Birchtree Mine Mineral Resource Statements

General criteria used in the estimation and classification of material as mineral resources include the following.

The tonnage and grade of mineral resources is based on a minimum mining width. For the Thompson Mine, the mining width for bulk mining (VBM) was 20 ft and for Birchtree Mine it was 30 ft. Both mines used a minimum mining width of 15 ft for selective mining method areas (cut-and-fill). Where the zone of mineralization is less than the minimum mining width, the resource estimate includes planned dilution necessary to achieve the minimum width.

The tonnage and grade of mineral resources also includes zones of internal waste where such zones could not be segregated.

The mineral resource estimate does not include any additional external diluting material (i.e. dilution = 0%) assumes 100% extraction (mineability = 100%) except for the two conditions stated above.

Cut-off grades have been applied to material classified as inferred, indicated or measured mineral resources. These cut-offs are based on the estimated costs for the proposed mining and processing methods and are estimated in the same manner, though with less supporting detail, as for mineral reserves.

Specific criteria used in the classification of mineral resources as inferred, indicated or measured are given below. Note that these are corporate bench marks and not industry standards. The final decision on mineral resource classification is left to the professional judgement of the RP for the mineral zone or orebody. Any significant departures from the corporate benchmarks are discussed and explained in the technical report.

Inferred Mineral Resources

The quantity and quality of inferred mineral resources was estimated on the basis of geological evidence and limited sampling, and reasonably assumed, but not verified, geological and grade continuity.

For the Thompson Mine, a drilling spacing of 100 ft or greater and for the Birchtree Mine a drilling spacing of 200 ft was sufficient to categorize material estimated as inferred mineral resources. Vale corporate guidelines for the nickel line of business used to define an inferred mineral resource also include a level of confidence of ±15% on the global recoverable metal, tonnes and grade.

Indicated Mineral Resources

The quantity and quality of indicated mineral resources was estimated based on detailed and reliable information, such as data obtained from drill holes that are spaced closely enough for geological and grade continuity to be reasonably assumed.

The drill spacing for material estimated as indicated mineral resources at Thompson Mine ranges from 50 ft to 100 ft and 40 ft to 200 ft for the Birchtree Mine. Vale corporate guidelines for the nickel line of business used to define an indicated mineral resource states that a level of confidence of ±15% on the recoverable metal, tonnes and grade over the area or the volume corresponding to the footprint of one year of production must be achieved.

Indicated mineral resources which have an associated pre-feasibility study and/or feasibility study to substantiate cost estimates and other economic parameters are classified as probable mineral reserves. Probable mineral reserves also include estimates of unplanned dilution (external dilution) and allowances for losses that are expected to occur in mining (mineability).

Measured Mineral Resources

The quantity and quality of measured mineral resources was estimated based on detailed and reliable information, such as data obtained from drill holes that are spaced closely enough for geological and grade continuity to be confirmed.

The drill spacing for material estimated as measured mineral resources at Thompson Mine ranges from 50 ft or less and 40 ft or less for the Birchtree Mine. Vale corporate guidelines for the nickel line of business used to determine a measured mineral resource: states that a level of confidence of ±15% on the recoverable metal, tonnes and grade over the area or the volume corresponding to the footprint of one quarter of a year's production must be achieved.

Measured mineral resources which have an associated pre-feasibility study and/or feasibility study to substantiate cost estimates and other economic parameters are classified as proven or probable mineral reserves. Note that proven and probable mineral reserves include estimates of unplanned dilution (external dilution) and allowances for losses that are expected to occur in mining (mineability).

2.13 Mineral Reserve Estimation

Mineral Reserve Estimation Overview

The following methodology is used for converting mineral resources into mineral reserves:

- The mineral resource model is updated to reflect the expected status of mining blocks at the start date of the new mining plan.
- Mining methods are selected for discrete zones of each orebody, based primarily on the geometry of mineralization. The MO use both bulk and selective mining methods.

- Operating and capital costs are estimated for each orebody, based on the mining methods used. The operating costs are used in conjunction with the Net Processing Return (NPR) formula to calculate cut-off values and delineate resource blocks that would be potentially economic to mine.
- Stope outlines are designed for potentially economic resource blocks. These outlines are based on realistic mining shapes and historic factors for mining recovery and dilution. This process is conducted iteratively, between the engineering and geology departments.
- The mineral reserves are assessed in isolation (i.e. excluding inferred mineral resources and potential mineral deposits) to verify the economic viability of the mineral reserves which only include proven and probable mineral reserves.
- A LOM schedule is generated for potentially economic stopes. A second economic evaluation is performed on the entire schedule. The material included in the LOM schedule includes proven and probable mineral reserves, measured, indicated and inferred mineral resources (adjusted to account for expected mining recovery and dilution) and may include potential mineral deposits (these are not typically adjusted to account for mining recovery and dilution).
- A risk analysis is performed to determine the sensitivity of economics to factors such as metal price, recoveries, capital cost, operating cost, and grade variability.

Resource Model Updates

Areas that have been mined or sterilized by mining are manually removed from the MRMR listing in the Datamine mineral resource block models to reflect their mined status. This involves creating cells inside the as-mined volumes, flagging these cells as mined-out and then superimposing them over the original un-mined mineral resource block model. The start of the mining sequence is projected to beginning of the year (i.e. January 1, 2009).

Mining Method Selection

The mining methods used at the Thompson Operations include conventional truck-shovel open pit mining, cut-and-fill mining (CAF) including Post Pillar CAF (PPCAF) and VBM. Underground mining is composed of both remnant pillar extraction in older mining blocks and new mining zones. The ore is crushed underground to -15 cm and hoisted at the T1 shaft to surface where it is sent to the concentrator. Birchtree ore is crushed, hoisted and trucked via gravel haul road to a stockpile area adjacent to the Thompson Mill.

The underground mining method selection is based on a number of factors including deposit geometry (primarily dip) and required advance development. PPCAF does have a lower recovery due to leaving of pillars (currently about 78%) while VBM achieves about 90% recovery on average. Future planning seems to favour VBM which is becoming the dominant method and currently amounts to about 75% of production.

The productivity of each underground mining method is shown in Table 2-15 for the overall MO (T1, T3, Birchtree combined) over the past 2.5 years. The productivity of CAF mining (predominantly the 602 Stope complex at T3) has been steadily increasing while VBM has decreased slightly. Productivity has declined about

25% in the 84 Orebody at Birchtree. CAF mining has been moderately more productive over the period considered here. It may be that CAF mining is more consistent and has not been as impacted by ground issues due to the smaller excavation sizes.

Table 2-15: Average Productivities for the Two Mining Methods (Tons per Manshift)

Method	2008	2009	To end of June 2010
CAF (80-90% 602 Stope)	24.2	28.5	34.2
VBM (all complexes)	28.9	25.7	26.9
VBM (Birchtree 84 Orebody)	40.8	31.2	30.1
VBM (Thompson 1D Upper)	30.2	22.0	27.5

It is the opinion of the QP that the mining methods employed at the MO are suitable for the deposit configurations. CAF mining is currently the most productive and lowest cost method although it inherently leaves about 20% of potential mineral reserves in post pillars. The level of review completed on the mineral resource estimation by the QP did not identify any fatal flaws.

Geotechnical Investigations

Underground mining at the Thompson Mine is going deeper in the future with over 25% of the MO mineral reserves in the 1D Lower Deep zone below 4200 Level. To date, ground stress has not been a major factor with the mining at the MO; however, at some vertical horizon this is likely to become more significant. The impact of deeper mining is likely to increase mining costs due to increased ground support needs and rehabilitation along with some reduction in productivity. Vale has completed geotechnical analyses to examine the effects of mining on ground conditions below 4200 Level at the 1D Mine, specifically the host rock between the footwall and hanging wall zones and the planned crown below 4200. Additionally, numerical stress analysis has been done to examine the stability of various stope block sizes below 4200 Level to help determine the optimum block size for the 1D Deep area. Similar assessments should be done for the planned stope-pillar mining sequence of this mining block including the interactions of various mining fronts and sill pillars within the same mining area.

The Lower 1D Orebody at T3 Mine is currently being mined on two mining fronts using PPCAF mining with 24 ft x 24 ft post pillars and a 26 ft cut width. A geotechnical study including both empirical and numerical modelling analyses was completed to review the current design and determine if pillar size reduction is feasible. This was done with the goal to optimize the overall recovery of the ore from this mining area. Based on the results of the study, it was concluded that the size of the post pillars could be reduced to 20 ft x 20 ft from the current size of 24 ft x 24 ft post pillars and increase the cut width to 30 ft from 26 ft wide while maintaining an adequate factor of safety. If this change is successfully implemented, it would increase the mineral reserves in the mining area by about 9%. Mining trials are planned to confirm the results of the study.

At the Birchtree Mine, the ground conditions pose more challenges due to the presence of Peridotite (ultramafic) inclusions and fault zones. Currently, Birchtree is experiencing some production issues due to ground issues in producing areas of the 84 Orebody. Ground support requirements are greater at Birchtree where shotcrete and cablebolts are used as needed.

There is only one geotechnical engineer for the all of the MO consisting of three underground mines. As mining gets deeper and involves more remnant mining areas, the geotechnical issues are likely to increase. The MO are supported by Vale staff in Sudbury and Toronto; however, this does not replace the day-to-day ground control needs of an active mining camp.

It is the opinion of the QP that the geotechnical issues are likely to increase as the both the Thompson and Birchtree Mines exploit deeper mineral reserves. The mining recovery, productivity and mining costs could be impacted by the geomechanical challenges. Birchtree Mine is currently experiencing ground control issues that have hampered production. MO conducts regular geotechnical investigations with the aid of corporate technical staff in Sudbury and routinely consider geotechnical issues when completing FEL2 studies and future mine planning. The level of review completed on the geotechnical investigations by the QP did not identify any fatal flaws.

Mining Equipment

MO primarily uses mechanized diesel-powered mining equipment. Lateral development is typically conducted using two-boom face drills paired with a mechanized bolter, load-haul-dump units (LHD) and a truck. Vertical development is executed using raisebore drills for shorter lengths and Alimak raise climbers for the remaining raising projects. In-the-hole (ITH) drills are used for VBM production drilling along with a cablebolting unit for ground support as needed (primarily at Birchtree). The mucking cycle is completed using a combined fleet of LHD units and underground haul trucks. Backfill is placed in the voids using trucks and LHD units. A fleet of support equipment is also employed and includes scissorlifts, service vehicles and personnel carriers.

At the older workings of the Thompson T1 Mine, LHDs are often captive and ore haulage is done with locomotives and track drives. Approximately 80% of all production at the Thompson Mine is hauled by a tram on the 3600 Level (about 4,000 Tpd) to the T1 shaft hoist which is capable of hoisting the planned tonnage in 2-25 Ton skips.

In general, the mine equipment used at the MO is appropriate for the mining methods used and planned production. The MO is similar to most modern mines and is dependent on diesel powered mobile equipment. The use of truck haulage in the deeper areas, specifically the 1D Deep which will amount to 60% of production in 7 years, is becoming more challenging from a ventilation perspective. Engineering studies are currently being done to assess alternatives to material handling from these areas. Alternatives that reduce the dependency on diesel equipment are being investigated, including additional shaft hoisting.

It is the opinion of the QP that, in general, the mine equipment used at the MO is appropriate for the mining methods used and planned production. The 3600 Tram is recognized as a future bottleneck to production at the Thompson Mine and studies are ongoing to address this issue. The level of review completed on the mining equipment selection estimation by the QP did not identify any fatal flaws.

Mining Rates

Table 2-16 presents the planned mining methods and rates by area for 2010 (to June 30) at the MO.

Table 2-16: Summary of Mining Rates for the MO (2010 LOM Plan, Actuals to June 30)

Mine	Mining Method	Plan Mining Rate, Tons/day*	Actual Mining Rate, Tons/day	% of Plan
1D	60% CAF / 40% VBM	3,000	2,934	98%
T1 & T3	VBM	1,870	1,757	94%
Birchtree	89% VBM / 11% CAF	3,325	2,733	82%
Total		**8,195**	**7,424**	**91%**

* *Wet Tons per day*

As of June 30, 2010, the MO has produced 91% of the planned year-to-date mine production. The largest variance of -18% is at the Birchtree Mine where ground control issues in the 84 Orebody VBM stopes are impacting production. Table 2-17 presents the actual mining rates for 2008, 2009 and to June 30, 2010 compared to the planned rates. The mines are grouped according the 2009 LOMP; 1D, T1 & T3 combined and Birchtree.

Table 2-17: Summary of Actual Mining Rates for the MO (Wet Tons per day)

Mine	2008		2009		To June 30, 2010	
	Plan	Actual	Plan	Actual	Plan	Actual
1D	2,897	2,354 (81%)	3,185	2,472 (78%)	3,000	2,933 (98%)
T1 & T3*	2,034	1,981 (97%)	2,075	1,888 (91%)	1,870	1,757 (94%)
Birchtree	3,777	3,207 (85%)	3,698	2,673 (72%)	3,325	2,733 (82%)
Total (% of Plan)	**8,708**	**7,542 (87%)**	**8,958**	**7,033 (79%)**	**8,195**	**7,423 (91%)**

* *T3 is 200 Tpd of remnant VBM recovery.*

During this 2.5-year period, mine production has been consistently below plan with the largest variances occurring at the Birchtree Mine. The continued drop in 2009 production from Birchtree is due to ground issues resulting from a flattening of the mining front. This limits stope selection during the transition to a more optimal mining sequence that will reduce ground stresses.

Currently, all of the ore from the 1D Mine must be trammed on the 3600 Level to the T1 shaft to be hoisted to the surface plants. The 3600 Tram is presently limited to about 4,000 Tpd. All personnel and materials for the 1D area are moved through the T-3 shaft and travel times to the deeper workplaces are increasing. In addition, ground control issues are likely to increase as the 1D Mine gets deeper. These factors are all placing increased production pressures on the MO to maintain current production rates. There is a 1D Rationalization Project underway to study a variety of mining options including material handling options such as new shaft facilities, internal winzes, expanding the 3600 Tram and others. The staff at the MO is clearly aware of these pressures and are actively working to find solutions and optimize the extraction of mineral resources in the future. One of the major factors to impact future mining rates will be the need to mine ever deeper mineral resources which will impact on ground control, ventilation and other services and personnel and material movements.

It is the opinion of the QP that the planned mining rates at the T1 and T3 Mines are appropriate for the mining methods used and planned production although the mining rates planned at the 1D and Birchtree Mines may be aggressive based on recent production history. Actual mining rates have been below plan at the MO for the last few years. The most significant shortfall is at the Birchtree Mine where increased ground stress from a flattening of the mining front has limited the number of available stopes. Other reasons for the negative variances are likely varied but may also be due, in part, to setting aggressive annual production targets. As the mines get deeper, it is possible that these issues may become more prevalent. The level of review completed on the mining rates by the QP did not identify any fatal flaws; however, the mine planning targets set need to be achievable.

Mine Services

Mine services for the MO mining facilities include shaft and ventilation infrastructure, the 3600 Tram, maintenance shops, hydraulic backfill pipeline and electrical, compressed air and water distribution networks.

The main hoisting shaft at the T1 Mine consists of 2 25-Ton skips and is sufficient to hoist future planned production. Ore from the T3 Mine is currently trammed to the T1 shaft via the 3600 Tram facility which is capable of moving an average of 4,000 Tpd. This infrastructure is becoming a bottleneck to future planned production at T3 (1D area). Also, personnel and equipment assigned to the T3 Mine are moved through the T3 shaft which is a non-hoisting shaft. The travel time to access the lower 1D Mine areas of the T3 Mine are currently averaging about 45 minutes. For these reasons, alternative approaches to moving ore to surface and for more efficient access for personnel and equipment are being investigated.

The Birchtree Mine does not currently appear to have any issues with shaft capacity and production is declining at this mine.

As both the Thompson and Birchtree Mines go deeper, the delivery of key mine services like backfill and ventilation will incur greater challenges and costs. Cemented rockfill will be the predominant backfill choice for future mining. Generally, development waste rock, mixed with normal Portland cement, is used to fill voids and the rock is supplemented with quarried rock from surface when required. Cement is stored in underground silos, mixed in tanks and transported as slurry to be mixed with the rock aggregate at the dump sites. As part of the 1D Rationalization Project, the long-term plan for backfill placement is being studied by engineering staff. The use of pastefill is also being investigated.

Other mine services such as electrical power distribution, de-watering and compressed air are typical of a modern mechanized mine and there do not appear to be any critical issues with these. Power estimates are expected to increase due to the increasing demand for surface fan power to deliver ventilation to the deeper zones.

It is the opinion of the QP that the mine services employed at the MO are appropriate and adequately support current mining operations. The level of review completed on the mine services by the QP did not identify any fatal flaws.

Mine Recovery and Dilution

Internal or planned dilution is included in the estimate of mineral resources as derived by the Mineral Reserve Optimizer (MRO) process. External or un-planned dilution (waste overbreak and backfill) as well as mining recovery are included in the estimate of reserve grade and tonnage and are defined as per Figure 2-8. These definitions are accepted industry standards.

All mined VBM stopes are surveyed using a Cavity Monitoring System (laser scanner) and mining recovery and dilution are calculated for a particular block as per the definitions on Figure 2-8. Mine recovery and dilution factors used for mineral reserve estimation range from 77% to 90% and 6% to 14%, respectively (MRMR 2009). This range of factors is reasonable and they are backed by years of production experience, quantitative assessments and mine-mill reconciliations. For the 2010 plan, the average combined mining recovery for the MO is 90%. Dilution at Birchtree Mine is 6% and, at the Thompson Mine, it averages 12%.

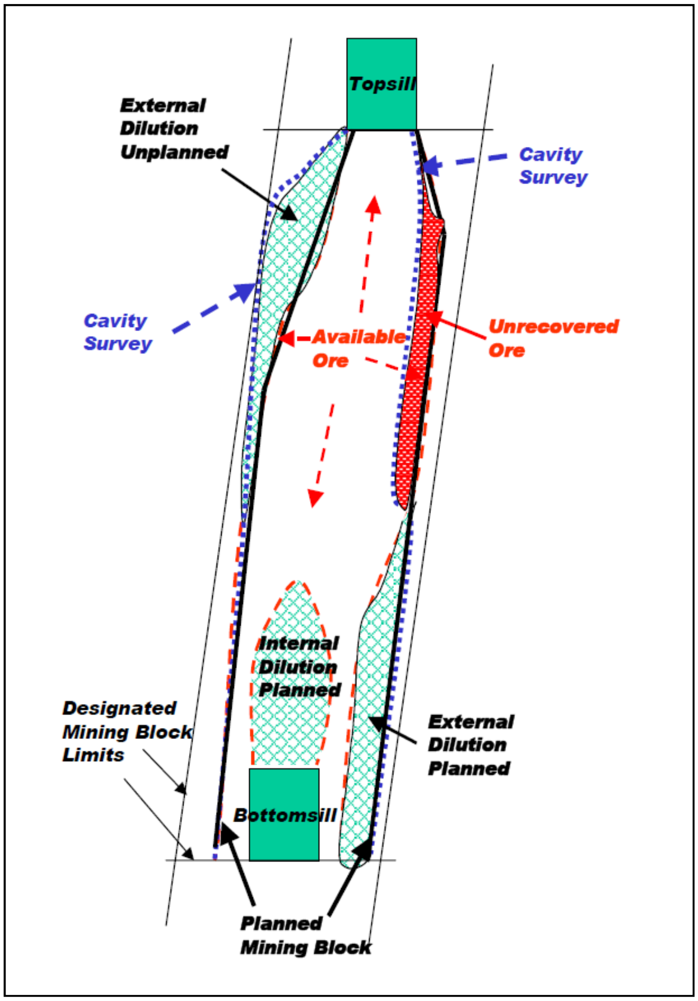

Figure 2-8: Dilution and Mining Recovery Definitions (BT 2009 MRMR).

No mining losses and no dilution was used for the Thompson 1C Pit design and is considered to be adequate if using a diluted block model with blocks of 20 x 20 x 20 ft. In the case of the smaller block size for the Thompson 1D Pit of 10 x 10 x 10 ft, 5% dilution and 95% mining recovery were used.

It is the opinion of the QP that the definitions and factors for mining recovery and dilution at the MO are reasonable and are backed by historical data and experience. The level of review completed on the mine recovery and dilution by the QP did not identify any fatal flaws.

Conversion of Resource to Reserve

Mineral reserve estimates are based on mineral resource models (Block Model or Polygonal) and must have a demonstrated mining plan or FEL2 study (preliminary feasibility) examination and demonstrate a positive Net Present Value (NPV). A mineral resource is then only converted to a mineral reserve if the overall MO Base Case NPV is not diminished by adding the new mineral resource to the overall plan. A Net Processing Return (NPR) formula is used to calculate mineral resource block value. This formula is similar to a Net Smelter Return formula except that it also includes the milling costs and corporate overhead costs. The NPR is based on plant metal recoveries and costs (for mill, smelter and refinery), metal prices, any transportation costs and exchange rate. A generalized diagram showing how the ore value is determined is shown on Figure 2-9.

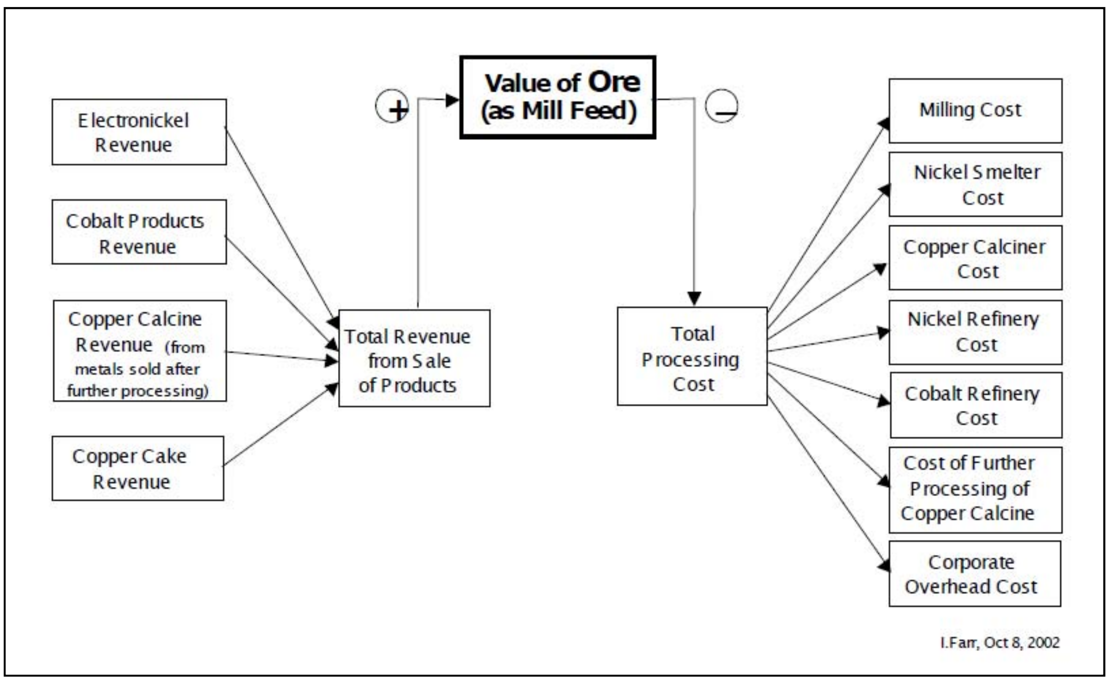

Figure 2-9: Diagram Showing Ore Value Determination at the MO (MO 2009 MRMR).

The actual formula that was developed in 1999 is quite complex and is comprised of 144 factors. It has not been updated since that time even though there have been some modifications to the plant flowsheet. Plant recoveries must be manually verified each month to ensure accurate results.

The first step in converting a mineral resource to a mineral reserve is to use the Datamine software tool called Mineral Reserve Optimizer or MRO. Vale has developed considerable site experience with this software and its key input parameters such as head grade target (mill cut-off grade), incremental target grade and maximum waste fraction (a factor to manage acceptable internal dilution). A selective mining unit size (SMU) is used to reflect the minimum mining unit for the selected mining method, PPCAF or VBM. The MRO process includes internal dilution that is governed by the maximum allowable waste fraction in a given SMU. MO has calibrated the MRO process over time and also does manual planning calibrations to confirm the MRO results. Following the MRO stage, and in consultation with site mining engineers, the MRO shapes, or envelopes, are factored for mine recovery and external dilution. At this stage, and in the absence of detailed mine planning, these mineral reserves are added to the Summary Table of MO mineral reserves. There is also a process in place for mine planners to gain approval to mine material below 1% Ni, or incremental ore. Mine planners use the NPR formula and mine cost sheets to assess individual mining blocks to evaluate economic viability or decide whether to mine incremental material in the detailed block design.

The next step to mineral reserve estimation involves detailed short-term mine planning which typically occurs from 3 to 12 months prior to actual mining. For this reason, the updated mineral reserves do not get reflected in the Summary Reserve Table since this document is only published annually. At this stage, mine planning engineers will conduct more detailed assessments of individual mining blocks. External dilution is added to account for waste overbreak and backfill additions and a mine recovery factor is applied based on historical results for similar mining methods and ground conditions. Due to the delay between stating mineral reserves annually and completing the detailed short-term planning, there will be discrepancies between stated mineral reserves and actual mined material. For example, if mined tonnage targets are behind plan, the tendency may be to mine lower grade material. If this happens regularly throughout the Operation, then meeting target grades and Ni production could be compromised and there will be a downward pressure on the mined grade. A small portion of of older mineral resources were estimated using polygonal models and have not been updated using the MRO process. It appears that these areas have a tendency to cause the greatest discrepancies to actual recovered material. This was noted at the T1 Mine where mined grade in the current year is lower than the stated reserve grade for particular blocks. It was suggested that this is due to the polygonal estimation method.

Pits

The Thompson T1 1-AB Pit, T-3 1-C Pit North and South and 1D Pit are included in the MO probable mineral reserves category and account for 10% of the total 2009 mineral reserves. There is a history of pit mining at the MO but currently no ore production is from pits.

A review was completed of the SRK pit design pre-feasibility report and it is not clear why the SRK did not use the NPR formula as is used for the underground reserve cut-off determination (SRK, 2007An update to the economic pit shells may be warranted to reflect current metal price and exchange rate. Price and cost sensitivities could also have been run for each pit to test changes to the economic shells.

It is the opinion of the QP that the NPR formula and mining cost sheet is used routinely by the mine planners at each operation and there is good fundamental understanding of incremental ore; however, the availability of incremental ore in combination with challenges meeting mine production targets will place a downward pressure on mined grades and overall Ni production

It is the opinion of the QP that the mineral reserve estimation methods at the MO are being followed and appropriate internal review is completed. The mineral reserve estimation and conversion from mineral resources to mineral reserves is completed to accepted industry standards and appropriate for mineral reserve reporting. The level of review completed on the mineral reserve estimation by the QP did not identify any fatal flaws.

2.14 Reported Mineral Reserves

The June 30, 2010 mineral reserve estimate for the Manitoba Operations per operating mine is summarized in Table 2-18 and was based on the December 31, 2009 published mineral reserves subtracted by the production from the Manitoba Operations from January 1, 2010 to June 30, 2010. The mineral reserves are a combination of proven and probable classified mineral reserves and the average grade of the principal metal, %Ni. The mineral reserve estimates are of in-place material after adjustments for mining dilution and losses due to mining recovery. No adjustments to these estimates have been made for metal losses due to processing.

Table 2-18: Manitoba Operation Mineral Reserves June 30, 2010

Mine	Category	Tonnes (000's)	% Ni	% Cu[1]
Birchtree Mine	Proven	2,753	1.83	0.10
	Probable	2,500	1.53	0.08
	Proven + Probable	5,254	1.69	0.09
Thompson Mine	Proven	5,199	1.98	0.12
	Probable	14,470	1.64	0.10
	Proven + Probable	19,669	1.73	0.11
Total Manitoba Operations	Proven	7,952	1.93	0.11
	Probable	16,970	1.63	0.10
	Proven + Probable	24,923	1.72	0.10

Notes:
1. Cu reserves are based on historical factors derived from corrections between Ni and Cu in assay data of diamond drill core. Thompson Mine has validated the factors by reconciling with mill credited production numbers over a 5 year period.

Table 2-19 lists the estimated mineral reserves from the MO Consolidated 2009 MRMR Technical Report for 2006 to 2009 and include proven, probable mineral reserves of %Ni and %Cu for the Thompson and Birchtree Mines.

Comparing the June 30, 2010 mineral reserve estimate against the December 31, 2009 estimate indicates that 1,174,000 tonnes at a grade of 1.57% Ni of material was mined for the first half of 2010 from the MO.

Table 2-19: Manitoba Operation Mineral Reserves 2006-2009 (Tonnes in 000's)

Mine	Reserves	2006	2007	2008	2009
Thompson Mine	Proven	7,069	6,266	6,382	5,877
	Ni%	2.18	2.17	2.05	1.95
	Cu%	0.14	0.14	0.13	0.13
	Probable	7,167	10,331	11,093	14,537
	Ni%	2.01	1.75	1.74	1.64
	Cu%	0.14	0.11	0.11	0.11
	Total	14,236	16,598	17,475	20,414
	Ni%	2.10	1.91	1.85	1.73
	Cu%	0.14	0.13	0.13	0.12
Birchtree	Proven	5,073	4,204	3,721	3,183
	Ni%	1.67	1.73	1.76	1.77
	Cu%	0.11	0.11	0.11	0.11
	Probable	4,746	3,334	3,292	2,500
	Ni%	1.45	1.45	1.44	1.53
	Cu%	0.10	0.10	0.10	0.10
	Total	9,819	7,538	7,013	5,683
	Ni%	1.56	1.61	1.61	1.67
	Cu%	0.10	0.10	0.10	0.10
Total	**Proven**	**12,142**	**10,470**	**10,103**	**9,060**
	Ni%	**1.97**	**1.99**	**1.94**	**1.89**
	Cu%	**0.13**	**0.13**	**0.13**	**0.12**
	Probable	**11,912**	**13,665**	**14,386**	**17,037**
	Ni%	**1.79**	**1.68**	**1.67**	**1.63**
	Cu%	**0.12**	**0.12**	**0.12**	**0.12**
	Total	**24,055**	**24,135**	**24,489**	**26,097**
	Ni%	**1.88**	**1.82**	**1.78**	**1.72**
	Cu%	**0.12**	**0.12**	**0.12**	**0.12**

2.15 Reconciliation and Reserve Audits

Grade Control Review

Table 2-20 lists the mined grades from the 2010 Plan versus the actual June YTD figures. As with the production rate, the largest variance is at the Birchtree Mine where the 84 Orebody is experiencing ground control challenges.

Table 2-20: Mined Grade and Ni Production for MO for June YTD versus Plan

Mine	Mining Method	Grade %Ni		June 2010 Plan Lbs Ni in Ore	June YTD Lbs Ni in Ore	% of Plan
		2010 Plan	Actual June YTD			
1D	60% CAF / 40% VBM	1.96	1.79	20,395,333	18,298,336	90%
T1 & T3	VBM	1.72	1.50	11,210,136	9,157,747	82%
Birchtree	89% VBM / 11% CAF	1.48	1.39	17,139,223	13,163,329	77%
Total		**1.71**	**1.57**	**48,744,692**	**40,619,412**	**83%**

Grade control is managed using borehole conductivity probing and visual estimation based on the quantity of sulphides present. In VBM areas, once a block is drilled in preparation for production blasting, a borehole probe is inserted into each hole to estimate grade within the stope block. These results are plotted against the mineral resource block model and mine planners determine an extraction plan to maximize recovery. In some cases, it is even possible to separate waste zones with blasting. If waste portions of a stope can be blasted and mucked separately, then this is done. Where mixing of ore and waste occurs, it is sometimes possible to visually separate waste material at the drawpoint. This is typically done by visually assessing the quantity of sulphide material and, if waste is determined, then this material is handled to a waste stockpile or dumped as backfill.

Reconciliation of Planned Mine vs. Actual Mined

Reconciliation studies are completed annually and compared to the mineral reserve estimates against the mill grades. The comparison is only approximate since the mill grades must be pro-rated back to the mining block and there are commonly significant changes to the ore outline as a result of the detailed drilling and mapping that occurs when the block is mined. In addition, it must be emphasized that the production data used for these reconciliations spans over several years of operations with different operating strategies affected by a wide range of metal prices and other economic constraints. However, the reconciliation does provide an indication of the comparison between mineral reserve estimates and production (mill “assigned”).

The 2009 reconciliation was completed for the 1D Orebody D and B zones, 1B Below 2400 Level, T1 Remnants and CAR 602 areas at Thompson Mine along with the 84 and 108 Orebodies at Birchtree Mine. The results are summarized in Table 2-21 with original data provided in Table 15.1 of the 2009 Manitoba Consolidated MRMR report (Smith and Liske, 2009).

Results from the reconciliation review indicate an underestimation of tonnes and overestimation of grade associated with polygonal estimates in 1D Above 3600 (D and B zones) and T1/T3 Remnants. Variances of grade and tonnage in other areas have been attributed to factors that included higher dilution than planned, low drill density and oblique drilling.

The current Ni in mill head grade production is at 83% of plan and this is about the average attained over the past 2.5 years and is summarized in Table 2-21. The lower than planned Ni in mill head grade production is primarily due to the lower than planned mined tonnages from each of the three mines. In some areas (1D, T1+T3 mines) the average mined grades have also been lower than planned thus compounding the issue.

Table 2-21: Actual versus Plan Mined Grades and Ni in Ore Production for the MO

Mine	Grade /Lbs	2008		2009		To June 30, 2010	
		Plan	Actual	Plan	Actual	Plan	Actual
1D	%Ni	2.02	1.72	1.82	2.05	1.92	1.79
	Lbs Ni in Ore	39,018,295	27,112,656	37,114,825	32,489,787	20,395,333	18,298,336
T1 & T3	%Ni	1.87	1.84	1.65	1.91	1.72	1.50
	Lbs Ni in Ore	25,351,887	24,275,925	21,877,820	23,072,961	11,210,136	9,157,747
Birchtree	%Ni	1.56	1.52	1.57	1.48	1.48	1.39
	Lbs Ni in Ore	38,940,212	32,333,834	37,202,967	25,083,845	17,139,223	13,163,329
Total	%Ni	**1.79**	**1.62**	**1.68**	**1.80**	**1.71**	**1.57**
	Lbs Ni in Ore	**103,310,394**	**83,722,415**	**96,195,612**	**80,646,593**	**48,744,692**	**40,619,412**
% of Plan	Of Lbs Ni in Ore	**81%**		**84%**		**83%**	

Grade control is managed on a short-term basis through a combination of conductivity probing and manual visual techniques which appear to be adequate. It is the opinion of the QP that there may be some optimistic grade planning and Ni in production material forecasting at the MO.

An "Operating" cut-off based on shorter term metal prices is also maintained in the MO and used in some instances to mine "incremental ore", when metal pricing is more favourable (higher). When this lower grade material replaces planned production defined by the mineral reserves, planned metal production is often not achieved. Mining lower grade material assists in alleviating any tonnage shortfalls being experienced but allows downward pressure on the overall average grade.

The level of review completed on the grade control by the QP did not identify any fatal flaws.

Audits

Vale MO completes three categories of audits which are described as follows:

1) Internal Vale nickel line of business Audits – These are completed by Vale (nickel line of business) staff either from the MO or other Vale (nickel line of business) operations. These audits can include procedural checks of sample database entry, and MRMR estimates, toll gate reviews of projects, etc. Examples of peer review documents for MRMR estimates and monthly QA/QC sample reviews were provided to Golder for review.

2) External Vale (nickel line of business) Audits – These are completed by Vale(nickel line of business) staff of analytical laboratories and included site visits to the ALS Chemex facilities in Thunder Bay and Sudbury, Ontario and Vancouver, British Columbia. Some of the ALS Chemex facilities appeared to be audited yearly by Vale (nickel line of business) staff.

3) External Audits – These are completed by external consultants. Scott Wilson Roscoe Postle Associates Inc. completed an audit of the estimation and reporting procedures for the mineral resource and mineral reserves of the Thompson Mine 1D Lower Ore Body in December 31, 2007 (Scott Wilson, 2007). It is our understanding that Vale(nickel line of business) undertakes external audits of a mineral zone reported as a mineral reserve from the MO regularly.

Internal Audit

A Vale internal audit report on the MO Ore Evaluation / Net Processing Return Formula was issued in December 2006 (Inco Internal Audit Report #CC2006-P17A). The audit identified a number of areas that require improved oversight and monitoring resulting in an audit opinion of needs improvement. Recommendations of the audit team included improved controls over the accuracy of the final NPR factors, establishment of formal review and approval procedures, regular update/review of the NPR factors, granting of NPR access to key front line personnel and improved training on NPR processes. Recommendations and action items are in the process of implementation. Full compliance was expected by the end of the first quarter 2008.

Vale provided Golder with four laboratory audits completed by Vale (nickel line of business) staff of ALS Chemex facilities in Thunder Bay, Sudbury and Vancouver in 2009 and 2010. During these audits, Vale staff reviewed the laboratory procedures used in sample preparation and analysis. The procedures were then compared against observations of ALS Chemex staff conducting these tasks. The Internal laboratory audits are discussed further in Section 2-11.

External Audit

AMEC E&C Services Inc. (AMEC) carried out an external audit on the Birchtree Mine mineral resource and mineral reserve estimates in November 2004 (AMEC, Audit of Resource and Reserve Estimation Methods Birchtree Nickel Mine, Thompson Manitoba, 2005). Golder did not review this report in its entirety but comments regarding the audit from the 2009 Manitoba Consolidated MRMR report (Smith and Liske, 2009) indicated that the methods used for the 2004 MRMR estimates were found adequate and in compliance with the applicable regulatory requirements (Tavchandjian, Preliminary Findings of Birchtree Mine External Audit, November 18, 2004). AMEC suggested operational improvements in certain areas to improve the process. The primary recommendations included the performance of blind checks on assays, estimating mineral resources rather than estimating mineral reserves directly from the mineral envelope, centralization of validation of databases, more systematic checks of block model results, and clearer definition of classification standards. In addition, AMEC strongly supports technical reviews conducted on site beneficiating from the input of other Vale (nickel line of business) professionals (geologist and engineers from other operations) in order to both enhance best business practices and increase the general level of knowledge throughout the organization.

In October of 2007, Scott Wilson (RPA) undertook an independent audit of the 1D lower mineral resources and mineral reserves. Preliminary findings were presented prior to their departure from Thompson. A few housekeeping issues were identified by the RPA audit group but they did not find any fatal flaws in the process. The final report was received in 2008 and deficiencies identified have been addressed as outlined in 2009 Manitoba Consolidated MRMR report (Smith and Liske, 2009).

Golder Model and Resource Review

The MO includes over 20 mineral zones or orebodies in the mineral resource inventory depending on how they are subdivided per mining area. Golder's approach to reviewing the mineral reserve estimates was to review a selection of mineral resource estimate zones completed at the Birchtree and Thompson Mines (T1/T3). This work was completed using two methods. The first review method was to interview an individual mine geologist who had completed a mineral resource estimate for one of the mineral zones. The second review involved comparing a NN block model constructed by Golder against the mine's indicator kriged model or NN model.

Site Model and Resource Review

One mine geologist from each mineral zone review guided the Golder QP through the estimation process starting from selecting (and excluding in some cases) drill holes, creating domain envelopes, variography analysis, block models generation (unfolded, NN, MIK) and grade and tonnage population.

The following geology staff and mineral zones were reviewed by Mr. Paul Palmer of Golder during the site visit:

- Janet Southern (Birchtree Mine): reviewed the 84 Orebody;
- Angie Pavetey/Al Proulx (T3 Mine): 1D Deep Footwall; and
- Holly Davidson (T1 Mine): 800 3-Shear.

Golder NN Model Comparison Review

Block models from each of MO (T1, T3 and Birchtree) were compared against Golder generated models. The models reviewed included the T1-1B, 1D Lower Deep Footwall (1D LDFW) and 84 Orebody. Keith Harrison of Golder created NN unfolded block model, using Datamine, of each of the zones. The data provided by MO included the folded final block models and 5 ft composited drill hole files from each of the zones. Golder did not manipulate any data provided and only applied the search parameters provided from the MRMR reports.

The results of the Golder block model global comparisons against the Vale models has shown reasonable tonnage differences in the range of <1% to 15%. Nickel grade differences between the models were slightly larger with differences in the range of -13% to 24%. Some of the grade differences have been attributed to the MO IK models including more waste material than the Golder NN model, comparing unfolded block models (Golder) to folded block models (Vale) and Golder did model density weighted nickel samples. Golder tabulated the tonnage and grade from each Vale IK final model and identified they match exactly to the reported mineral resources estimates in Vale's MRMR reports.

The results of the block model comparisons are provided in Table 2-22.

Table 2-22: Golder-Vale Block Model Comparison

Deposit	Model	Tons	%NI	QNI
1D Lower Deep FW	Vale Global	45,810,738	0.6824	0.0551
	Golder Global	45,702,629	0.5521	0.0489
	% Difference	0.24%	24%	13%
T1 - 1B	Vale Global	15,747,000	1.063	0.097
	Golder Global	13,696,977	1.2242	0.1276
	% Difference	15%	-13%	-24%
Birchtree - 84 OB	Vale Global	38,311,806	1.1335	0.1036
	Golder Global	38,371,274	0.9926	0.1025
	% Difference	-0.15%	14%	1%
Total	Vale Global	99,869,544	0.915462	0.080312
	Golder Global	97,770,879	0.819135	0.080961
	% Difference	2.15%	11.76%	-0.80%

It is the opinion of the QP that the mineral resource estimation methods employed at the MO are being followed and appropriate internal review is completed. There is an internal documentation process showing which files are being used and the estimation parameters employed in order to reproduce the mineral resource estimates. The mineral resource estimation is completed to accepted industry standards and appropriate for mineral reserve reporting. The level of review completed on the mineral resource estimation by the QP did not identify any fatal flaws.

2.16 Environmental

A review of the environmental summaries in the 2009 MRMR Technical Reports for the Birchtree and Thompson Mines and the 2009 MO Consolidated MRMR Technical Report was conducted through a fatal flaw review. Golder requested the following for each mine site to conduct the review:

- a list of environmental permits/licences/authorizations including that date issued, process or operation permitted and expiry date (if any);
- a current site plan; and
- confirmation that a Closure Plan was filed, the date issued and the updated closure costs.

Follow-up correspondence with Glen House, of Vale, to provide additional information and further clarification was also completed.

Of the information provided to Golder, the Birchtree Mine was found to have the necessary environmental permits for a typical mining operation. The Environmental Act Licence (#1881) with Manitoba Conservation permits the facility's air and water discharges which would include the effluent treatment plant. Licences and authorities under the Manitoba Water Stewardship, the Department of Fisheries and Oceans and Environment Canada were all present.

The Thompson Mine also was found to have the necessary environmental permits for a typical mining operation. An Environmental Act Licence has not been issued by Manitoba Conservation for the Thompson Operations as Thompson Mine pre-dates the 1988 Manitoba Environment Act and is considered to be a "grandfathered" facility. In 1970, the province issued the Thompson site the permit numbered 960 VC which encompasses the Thompson mine, mill, smelter and refinery for air and water discharges. MO has indicated that they are in the process of updating this permit as part of the tailings basin capital project and have already been in correspondence with the province. Licences and authorities under the Manitoba Water Stewardship, the Department of Fisheries and Oceans and Environment Canada were all present for the MO.

A detailed review of each site's sampling procedures, frequencies and/or sample analysis to determine whether they are meeting all the requirements under the above mentioned licences was not within the scope of this review.

The total closure costs listed in each site's 2009 MRMR Technical Report was accurate with the 2008 Closure Plan updates which we received for each site as part of this study.

2.17 Community and Government Affairs

The MO has been in production in the Thompson area since 1959 at the Thompson Mine and 1966 for the Birchtree Mine. The MO is the largest employer in the city of Thompson.

Aboriginal or First Nations peoples may have rights over portions of the lands covered by the MO OIC Leases and Mineral Leases. The Manitoba government (Crown) has an obligation to consult with Aboriginal groups where their rights may be affected by a government action. This obligation may need to be satisfied by the Crown in connection with development on Vale's properties which may affect those rights. There are no known consultation obligations which would materially impact the mineral reserve estimates at this time. However, consultation obligations with the community may need to be satisfied before areas containing mineral resources can be developed which could be similar to the Ontario Operations.

2.18 Operating Costs

The MO is a mature mining camp and there is much experience and historical cost data. Mining costs are tracked monthly by specific mining activities and areas which allows staff to assess variances and perform better forecasting for future mining areas. These costs are tracked by an accounting system that depends on cost codes for all activities and consumables. Of course, these figures will only be as good as the numbers input and there is risk that the system may overwhelm supervisors and staff that are required to enter the proper codes for each and every cost item. A summary of cash operating costs is provided in Table 2-23.

Table 2-23: Cash Operating Cost Summary

Cash Cost Summaries	US$ '000
Hourly compensation	873,529
Salary compensation	469,591
Supplies	690,733
Reagents	105,825
Sundry	43,012
Taxes and Insurance	86,535
Energy	321,242
Services and Contracts	511,606
Equipment	69,238
Depreciation	399,271
Amortization	473,716
Redistributions	-18,762
Total Operating	**3,743,749**

Generally, mining costs are forecast using historical information and trends. Additional detail is used when a particular mining block is assessed for mining and more specific costs are applied to the block depending on specific requirements. These cost calculation tools are pushed down to the mine planning level where decisions are made on cut-off grades and incremental ore inclusion.

Table 2-24 presents the total mining cash costs by mining area as of June 30, 2010 compared to the 2010 Plan to June. (The three mine areas are split according to the monthly cost sheets and T3 Mine is predominantly the 1D complex). Total cash costs here include all operating and maintenance direct and indirect costs plus distributed overhead costs. Amortization and depreciation costs are not included.

Table 2-24: Total Mining Cash Costs for the MO

Mine	2008			2009			To end June 2010		
	Plan	Actual	Var.	Plan	Actual	Var.	Plan	Actual	Var.
T1	$64,199,666	$67,582,715	+5%	$56,397,754	$57,558,961	+2%	$30,429,190	$30,698,836	+1%
T3	$56,514,438	$64,642,961	+14%	$69,038,205	$70,232,706	+2%	$39,335,387	$41,317,964	+5%
Birchtree	$77,102,309	$82,971,213	+8%	$82,333,954	$77,065,524	-6%	$43,652,133	$41,591,421	-5%
Total	**$197,816,412**	**$215,196,889**	**+9%**	**$207,769,913**	**$204,857,192**	**-1%**	**$113,416,710**	**$113,608,222**	**0%**

For the past 2.5 years, total cash mining costs have been within +/-10% of plan with the exception of the T3 Mine in 2008 (+14%). On a cost per Ton basis, however, the total mining cash costs have been higher than plan for all three mines over the past 2.5 years as shown in Table 2-25.

Table 2-25: Total Mining Cash Costs for the MO ($ per wet Ton)

Mine	2008			2009			To end June 2010		
	Plan	Actual	Var.	Plan	Actual	Var.	Plan	Actual	Var.
T1	$102.93	$107.06	+4%	$92.27	$101.69	+10%	$102.94	$106.84	+4%
T3	$53.67	$76.73	+43%	$62.56	$82.11	+31%	$69.45	$76.10	+10%
Birchtree	$60.76	$76.55	+26%	$68.29	$89.53	+31%	$74.17	$85.98	+16%
Total	$67.15	$84.14	+25%	$71.14	$89.77	+26%	$78.19	$86.46	+11%

The T1 Mine has experienced the lowest overruns (4%-10%) while the T3 Mine has experienced cost per Ton increases of +43% in 2008 and +31% in 2009. The cost per Ton overruns are primarily due to lower than planned mined tonnage from each of the mines (as presented earlier in Table 2-17). The operating and maintenance indirect costs, on a cost per Ton basis, are particularly affected by lower mined tonnages.

The total cash costs are currently 11% above the plan with the largest variance occurring at Birchtree where mined tons are 16% behind plan mainly as a result of some ground control issues in the 84 Orebody. Since mining at both Birchtree and T3 is getting deeper, it is likely that there will be increasing upward cost pressures. This will be a result of increased ground support and mine services costs and potentially lower productivity due to longer travel times and more challenging mining conditions.

2.19 Capital Costs

Table 2-26 presents the capital cost spending to support the five-year plan at the MO, 2010 to 2014.

Table 2-26: Capital Cost Schedule for Five-Year Plan at the MO ($000's)

Area	Type	2010	2011	2012	2013	2014
Thompson Mine	Equipment	$18,727	$24,044	$18,549	$19,093	$19,696
	Development	$31,100	$25,026	$19,307	$19,872	$20,500
Birchtree Mine	Equipment	$3,370	$2,513	$2,302	$1,897	$964
	Development	$9,000	$7,537	$6,906	$5,691	$2,892
Mill/Smelter/Refinery	Equipment	$43,451	$78,945	$72,725	$34,250	$59,250
Sustaining	Equipment	$7,330	$4,000	$3,000	$3,000	$3,000
Total	**All**	**$112,978**	**$142,065**	**$122,789**	**$83,803**	**$106,302**

Mobile equipment at the MO is generally acquired under operating lease arrangements. At the end of the lease, the equipment is purchased as a "buy-back" and this expense is then capitalised. Mine development costs, or Approved Capital Development (ACD) expenses, are backed by at least a FEL2 study (pre-feasibility). For the MO cashflow model, only those capital costs that support mineral reserves are included. Sustaining capital costs in the five-year plan are about 3% of total capital costs post-2010 (~$1.25/Ton).

Total mining cash costs have been within 10% of plan for the past 2.5 years; however, due to lower than planned production rates, these costs have been consistently above plan on a cost per Ton basis. Capital cost forecasts in the five-year plan appear to support the LOMP and future mine development. Sustaining capital costs post-2010 are about 3% of total capital, or $1.25/Ton, while the 2010 plan is for 6.5%. These future costs appear to be low. The level of review completed on the operating and capital costing by the QP did not identify any fatal flaws.

2.20 Taxation

Taxable income arising from carrying on the activities of the MO is subject to comprehensive corporate income taxation under the Income Tax Act (Canada) (the "Income Tax Act"), the Manitoba Income Tax Act and mining tax under the Mining Tax Act (Manitoba). The Province of Manitoba is an "agreeing province" such that its tax base for the purposes of corporate income tax is harmonized with the federal corporate tax base. Mining income earned in Manitoba is subject to current statutory tax rates under the Income Tax Act of 18.0% (2009 – 19.0%) and 12.0% (2009 – 12.5%) under the Manitoba Income Tax Act.

The Mining Tax Act (Manitoba) imposes a tax on mine profits derived from mining activities undertaken in the province. Effective June 30, 2009, the mining tax rate was reduced (2009 – 18.0%) and will be graduated, based on the amount of profits. Profits of less than $50 million will be taxed at a rate of 10.0%; profits between $55 million and $100 million will be subject to a tax rate of 15.0%; and profits in excess of $105 million will be taxed at a rate of 17.0%. Notch rates will apply for profits between the graduated profit levels.

The MO is also subject to capital tax under the Corporation Capital Tax Act. Taxable capital allocated to the province is subject to a 0.2% tax (2009 – 0.3%) on taxable capital. The capital tax rate increases to 0.4% (2009 – 0.5%) on taxable capital in excess of $11 million. Subject to balanced budget requirements, the province is scheduled to phase out the general capital tax effective December 31, 2010.

2.21 Economic Evaluation of Mineral Reserves

Golder consultants were not provided with a copy of the Manitoba Operations discounted cash flow (DCF) spreadsheet model; however, Golder was permitted to review and audit the DCF model on secure Vale computers to gain an understanding of the model, to assess its correctness and to test project sensitivities to key input variables.

Key Assumptions

A summary of the key parameters used in the economic analysis for the Manitoba Operation is presented in External Audit of Mineral Reserves, Volume 1, Consolidated Report, Key Assumptions.

Manitoba Operation Cash Flow Evaluation

The cash flow forecast is based upon the updated, depleted mineral reserve estimate for the MO deposits. The total MO cash flow for both the Vale and three-year pricing assumptions, remained positive demonstrating project economics supporting the declaration of mineral reserves.

The cash flow forecast is based on the June 2010 update of the 2009 MRMR Economic Model, including mineral reserve depletion year-to-date, which reflects the following assumptions:

- The financial calculations are based on an after tax discount.
- Taxes are calculated per the discussion in Section 2.20 of this report.
- All costs and prices are in un-escalated “real” dollar terms.
- The operating costs include both fixed and variable cash mining costs, based on the mine plans, and the milling, smelting, refining and delivery variable cash costs based on the 2009 actual costs to the end of May, 2009.
- Fixed cash costs for the MO overheads, the mill, smelter and refineries and the corporate cost distributions are based on the 2009 budget and are included as line items, adjusted over time based on the annual ratio of the processed Ni from mineral reserves only to the total Ni production in the life of mine plan.
- Closure cash costs are included as lump sums at the end of the life of a site, following the completion of the life of mine plan.
- Unit cost assumptions are based on a defined metal throughput for the 2009 Plan (not reviewed by Golder).
- Future unit cost assumptions assume similar metal production.
- Capital costs include forecast expenditures for the mines, mill, smelter, refineries and other departments.
- Production is based on the MO mineral reserves only; no external feeds or concentrates have been included in this economic analysis.
- Mill recoveries for copper and nickel are based on a mill model, with factors updated to match the 2009 production plan. Smelting and refining recoveries are also based on factors from the 2009 production plan.
- Revenue is calculated from the recoverable metal and the long-term forecast of metal prices and exchange rate, based on SEC reporting requirements (three-year moving average prices). Revenue from the sale of a copper concentrate is included, based on the contained metal, accountability factors and the long-term forecast for metals prices and exchange rates. The sale of copper anodes is addressed in the model.

Sensitivity Analysis

Golder was permitted to review and audit the DCF model on secure Vale computers to gain an understanding of the model and to assess its correctness and to test project sensitivities to key input variables.

It was observed that the model contained construction costs, reclamation and closure costs, detailed federal and provincial tax sheets, sustaining capital allowances, and the correct schedule from the (updated) 2009 MRMR reports. The base case cost and price assumptions have been updated since the release of the 2009 MRMR, and these changes are reflected within the model.

Base case cash flows were observed for individual years using the three-year moving average price assumption scenario. Using the DCF spreadsheet, significant changes were made to price and cost assumptions to test the robustness of project economics. The cases tested involved making +/-20% changes, in five percentage point increments, to nickel price, capital expenditure, operating costs and foreign exchange. Furthermore, Golder tested the effect of changes in discount rate between 6% and 10%, in increments of half a percentage point.

The results are presented on Figure 2-10.

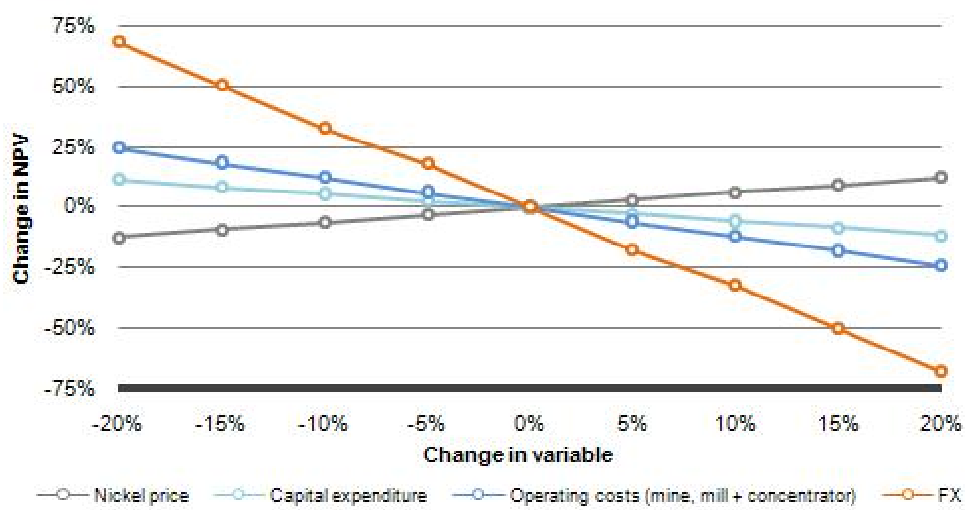

Figure 2-10: MO Sensitivity Analysis

The NPV was most highly sensitive to the US$/C$ exchange rate with the operating cost, capital cost and nickel price having a less significant effect on the NPV. Foreign exchange is considered a highly significant value driver. The NPV was least sensitive to mine capital costs.

Conclusions and Recommendations

In both cost and pricing assumptions scenarios used (Vale and three-year moving average), positive project economics support conversion of mineral resources to mineral reserves. Under sensitivity analysis, the NPV remained positive in all cases tested, suggesting robust project economics.

The Model is large and cumbersome, due to a long mine life and multiple previous stakeholders in the data. This has led to complexity and multiple formulae referencing cells on multiple input sheets, in addition to formula trails that are difficult to follow. Legacy models are difficult to audit and frequently contain much information that is not used.

2.22 Mine Life

The MO develops an annual Life Of Mine Plan (LOMP) that includes all mineral reserves, mineral resources and potential mineral deposits. The most current LOMP was developed in late 2009 and covers the period 2010 to 2047, or 37 years of production. The 5-year plan (2010 to 2014) is composed entirely of mineral reserves only.

In the current LOMP (2009) the T1, T3 and Birchtree Mines show declining production to 2014 while the 1D area is increasing. Table 2-27 presents the five-year mine production rates for all three mines of the MO.

Table 2-27: Five-Year Mine Production for MO (Wet Tons Mined from LOMP 2009)

Mine	2010	2011	2012	2013	2014
1D	977,870	847,600	1,013,700	1,059,500	1,141,000
T1 & T3	592,070	697,966	523,527	522,904	491,282
Birchtree	1,083,951	882,543	887,349	856,488	706,300
Total	**2,653,891**	**2,428,109**	**2,424,576**	**2,438,892**	**2,338,582**
Tpd	8,141	7,448	7,415	7,481	7,174

* *Wet Tons (Birchtree is converted from dry using moisture factor of 0.982)*

Table 2-28 presents the five-year plan for total Ni production from the MO. There is a 9% decrease in Ni pounds produced by 2014 while average mined grade remains relatively constant. The Ni production decrease is due to the decreasing mined tons over the same period.

Table 2-28: Five-year Ni production for MO (Lbs Ni in Ore from LOMP 2009)

Mine	2010	2011	2012	2013	2014
1D	37,564,289	33,767,524	39,651,156	39,248,184	41,233,002
T1 & T3	19,696,499	23,742,462	17,850,278	18,278,129	16,058,014
Birchtree	31,566,567	27,982,786	27,724,874	28,002,400	23,543,254
Total Lbs Ni	**88,827,355**	**85,492,772**	**85,226,308**	**85,528,713**	**80,834,270**
Grade, %Ni	1.71	1.79	1.79	1.79	1.76

Currently, the Thompson 1D Mine contributes 37% of the tons and 42% of total Ni Lb production at the MO. In ten years, or by 2020, the 1D Mine will contribute 64% of mine production and 66% of total Ni Lbs. By the same date, the T-1 and T-3 Mines will only contribute 6% of total production (for both Tons and Ni Lbs). Clearly, the 1D Mine complex is the future of the MO and this is well-recognized by MO staff. The level of effort currently applied to the 1D Rationalization Project demonstrate the importance of this transition.

A detailed LOMP is developed for the MO based on individual mining complexes and mining horizons. This plan is supported by historical data and factors, actual mine plans and FEL2 studies depending on the area. The five-year plan shows declining production at a relatively constant mined grade. The level of review completed by the QP on the mine life plan did not identify any fatal flaws.

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June 30_2010 MRMR Summary Table.xls - *Summary Table of MO June 30, 2010 Reserves/Resources/Potential Mineral Deposits*

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Thompson 2010 Checks.xls

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12 – December 2008/09 T1/T3/BT WPCosts and Eff, Excel Spreadsheets.

06 – June 2010 T1/T3/BT WPCosts and Eff, Excel Spreadsheets.

Presentations

T3 Mine – 2010YTD

T3/1D => Current Mining Areas

Vale-Inco Limited – Manitoba Division Tailings Management Area, May 2010

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Birchtree Mine Longitudinal

Birchtree Development Layouts

Longitudinals of Thompson 1D

Report Signature Page

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