Baffinland Iron Mines LP

Mary River Expansion Stage 3

Definitive Study Report

Section # 3 - Geology

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Regional Geology

The Mary River Group is part of the Committee Bay Belt, an assemblage of granite-greenstone terrains, rift basin sediments and volcanic rocks which lie within the northern Churchill Province and extend from southwest of Baker Lake for over 2,000 km to northwestern Greenland. Mary River Group greenstone belts form isolated remnants in a roughly 65 km long stratigraphically coeval volcanic series, which has been highly contorted, deeply eroded and forms a discontinuous series of volcanogenic units within older gneiss and migmatite formations, The iron formations, of varied types and quality, occur discontinuously within the metasedimentary mid-section units of the Mary River Group.

Local Geology

High-grade iron deposits were discovered in 1962 within a deformed granite-greenstone terrain at Mary River on northern Baffin Island, about 160 km south of Pond Inlet. Initial fieldwork from 1962 to 1965 outlined four exposed deposits (Deposit Nos. 1, 2, 3, and 4) of high-grade hematite-magnetite mineralization hosted within extensive belts of banded iron formation. The Mary River iron ore deposits represent high-grade examples of Algoma-type iron formation. The deposits are characterized by zones of massive, layered to brecciated hematite and magnetite, variably intermixed with banded oxide to silicate facies iron formation.

Property Geology

DEPOSIT NO. 1

Deposit No. 1 is currently the largest defined iron ore deposit in the Mary River area. The deposit has a total strike length, as defined by outcrop and magnetic anomalies, of about 3,800 m. Outcrops of high-grade iron oxides consisting of hematite and magnetite in various proportions and of specularite are exposed along the margin and crest of Nuluujaak Mountain at elevations ranging from 250 m to 700 m, over a strike length of 2,500 m. A possible additional strike of 550 m is suggested by magnetic surveys and outcrop to the south. Magnetic survey data also indicate the continuation of the iron formation for about 750 m to the north.

DEPOSIT NO. 2

Deposit No. 2 outcrops on a ridge located 2.6 km east of Deposit No. 1. The deposit consists of dark steel to blue-grey weathered high-grade specularite iron formation outcropping up to 40 m in width and 90 m in length. The deposit has been traced for over 600 m along strike. The deposit strikes west-southwest and grades into a south to south-southeast dipping belt of banded oxide facies iron formation up to 100 m wide. The zone of high-grade iron formation outcrops from 610 m to 670 m in elevation.

DEPOSIT NO. 3

Deposit No. 3 is situated on the crest and lower slope of a ridge 670 m south of Deposit No. 2. The deposit consists of high-grade hematite and specularite iron formation outcropping at an elevation of 490 m to 530 m and has a drilled strike extent of approximately 2.5 km. High-grade iron formation outcrops and float associated with a belt of Mary River Group metasedimentary and metavolcanic rocks can be traced along strike and in aeromagnetic anomaly patterns intermittently for more than 9 km east-northeast and northeast to the Glacier Lake area.

DEPOSIT NO. 4

High-grade iron formation of Deposit No. 4 outcrops on a low ridge 27 km northwest of Deposit No. 1 and three km west of the Central Borden Fault zone. In this area, exposures of high-grade magnetite and specularite iron formation occur as a series of elongated lenses or bands, 5 m to 75 m wide that outcrop intermittently over a strike length of 2,800 m within the mine lease boundary. Due to the predominantly narrow widths encountered in Deposit No. 4 and presence of high sulphur and high phosphorus, little potential for additional tonnage is anticipated in the immediate Deposit No. 4 area. The deposit is open at depth, however the potential in-pit waste rock contains high sulphur values.

DEPOSIT NO. 5

The 2008 airborne magnetic survey outlined an anomaly extending 21 km southeast from Deposit No. 4. Deposit No. 5 was discovered in 2009 within this magnetic anomaly and is located approximately four kilometres southeast of Deposit No. 4. Deposit No. 5 is comprised of two main hematite enriched lenses within a broader regionally continuous banded iron formation. The largest outcrop of high grade mineralization associated with the main Deposit No. 5 lens can be traced for approximately 700 m in strike length and has an exposed width of 70 m. Three additional narrow exposed intervals of enriched iron formation occur to the southeast of Deposit No. 5.

Mineralization

The Mary River deposits comprise a number of iron formations which have been enriched and altered to varying degrees. Original banded iron formations comprised of alternating layers of magnetite and hematite are preserved in several locations along strike of existing high grade deposits. The regional metamorphism and folding associated with the Hudsonian Orogeny resulted in significant crustal thickening. This period also resulted in zones of weak to very efficient leaching of silica. Subsequent hypogene and metamorphic events led to the alteration of magnetite to hematite and specular hematite. Surface outcrops differ in iron, silica, and sulphur content and in the proportions of their main oxide minerals – hematite, magnetite, and specularite.

3.0 Geological Setting and Mineralization

The following is taken from RPA Inc. (2013b)

3.1 Regional Geology

The Mary River Group is part of the Committee Bay Belt, an assemblage of granite-greenstone terrains, rift basin sediments and volcanic rocks which lie within the northern Churchill Province and extend from southwest of Baker Lake for over 2,000 km to northwestern Greenland (Jackson and Berman, 2000). The Committee Bay Belt is joined to the south by the approximately 1.9 Ga to 1.8 Ga Baffin Orogen. The Committee Bay Belt has been divided into major assemblages, which include the following:

a) Archean-age banded granite migmatites and three or more phases of gneissic granitic intrusions, traversed by deformed amphibolite dikes. Ages to 2.85 Ga, are unconformably overlain by the Mary River Group. The units are strongly metamorphosed.

b) Late-Archean Mary River Group; a diverse assemblage of metasedimentary and metavolcanic rocks, preserved in narrow, folded greenstone belts. Ages 2.76 Ga to 2.72 Ga. Belts generally show a lower sequence of varied metavolcanics, overlain by metasedimentary- metavolcanic sequences including iron formation, succeeded by an upper group of metavolcanic and metapelitic clastic sedimentary units with high- level metamorphism.

c) Paleoproterozoic Piling Group; metasedimentary/metavolcanic sequence including quartzites, marble, sulphidic iron formation, black schists, mafic metavolcanics. Ages 1.9 Ga to 1.8 Ga with medium-level metamorphism.

d) Mesoproterozoic Bylot Supergroup, in the Borden Rift Basin; siliciclastic and carbonate sedimentary rocks, some mafic volcanic units. Age 1.27 Ga with low-level metamorphic facies.

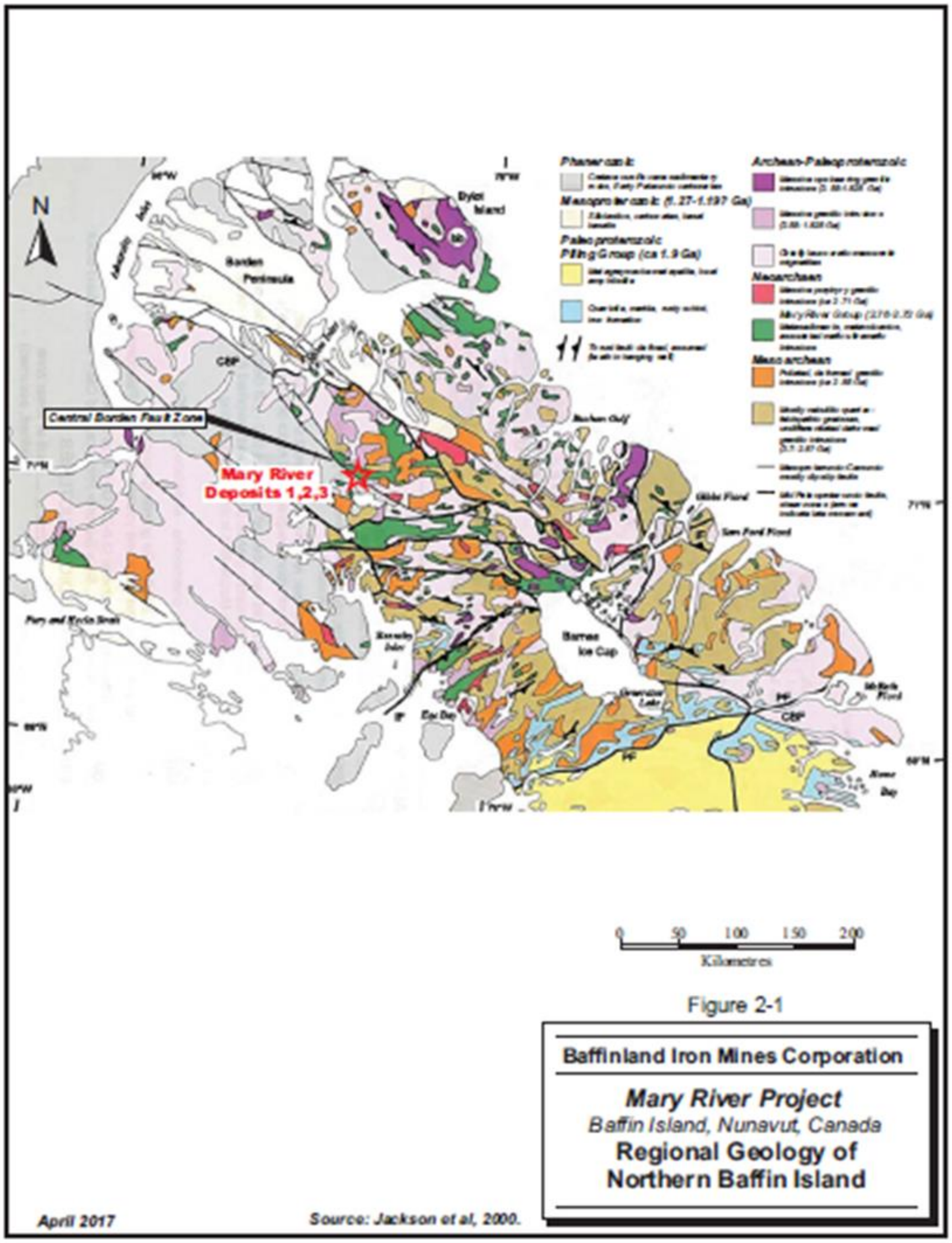
e) Early Paleozoic Cambro-Ordovician (Turner Cliffs-Ship Point Formation); unmetamorphosed clastic and carbonate sedimentary rocks, locally preserved in northwesterly-trending grabens. Age 400 Ma to 500 Ma.

Mary River Group greenstone belts form isolated remnants in a roughly 65 km long stratigraphically coeval volcanic series, which has been highly contorted, deeply eroded and forms a discontinuous series of volcanogenic units within older gneiss and migmatite formations (Figure 3-1). The belts consist most commonly of a lower sequence of felsic to mafic metavolcanic rocks and an upper sequence of turbiditic pelite-greywacke. The stratigraphic position of iron formation, quartzite, conglomerate, minor marble and volcanic breccia may vary on a regional scale (Jackson and Berman, 2000).

The iron formations, of varied types and quality, occur discontinuously within the metasedimentary mid-section units of the Mary River Group. Their outcrop patterns are interrupted and truncated by original local sedimentary facies variations and by post-depositional folding, faulting, and erosion. Only in a few locations, such as Mary River, do the iron formations have the required thickness, quality, and continuity sufficient to be of potential economic interest.

The regionally-extensive Franklin dolerite dike swarm generally follows the direction of major northwest-trending fault sets. These major fault systems persist for hundreds of kilometres and are marked by fault-line valleys and scarps, and show evidence of very large vertical and horizontal displacements. One of these, the Central Borden Fault Zone, passes about one kilometre to the south of the Mary River iron deposits. The fault separates the Mary River Group rock (~2.75 Ga age) on the northeast from the early Paleozoic formations (Turner Cliffs and Ship Point formations) to the southwest.

Figure 3-1 Regional Geology



3.2 Local Geology

The local geology is presented on Geological Survey of Canada Map 1451A "Geology of Icebound Lake, District of Franklin, 1:250 000 (Jackson et al., 1978a). Closed-file maps of the geology at 1:50,000 scale are presented by Geological Survey of Canada, Geology of NTS Sheets 37G/5 and 37G/6 (1965) by G.D. Jackson. The geology of the Mary River area has been synthesized by BIM's senior geologist, T. Iannelli (Iannelli, 2005).

High-grade iron deposits were discovered in 1962 within a deformed granite-greenstone terrain at Mary River on northern Baffin Island, about 160 km south of Pond Inlet. Initial fieldwork in from 1962 to 1965 outlined four exposed deposits (Deposit Nos. 1, 2, 3, and 4) of high-grade hematite- magnetite mineralization hosted within extensive belts of banded iron formation (Figure 3-2). Deposits No. 1 to 3 occur within a single 30 km^2 area, while Deposit No. 4 is situated 27 km to the northwest. The sedimentary-volcanic succession in which the iron formations are hosted was designated as the Mary River Group by Jackson in a 1966 paper (Geology and Mineral Possibilities of the Mary River Region, Northern Baffin Island, Canadian Mining Journal, 87, No. 6, 57-61).

The complexly folded Mary River Group greenstone belt, in the Mary River area, has a strike length of about 65 km and an inferred width of up to six kilometres (Jackson et al., 1978a). Rocks of the Mary River Group in the Project area include banded oxide and silicate facies iron formation, high-grade iron formation (hematite, magnetite and mixed hematite-magnetite-specularite varieties), and mixed metasedimentary rocks (quartzite, metaconglomerate, metapelites, metagreywacke and related derived cordierite-staurolite-garnet-mica to quartz-feldspar-biotite schists and gneisses) (WGM, 1964, 1965; Jackson et al., 1978a; Jackson, 2000).

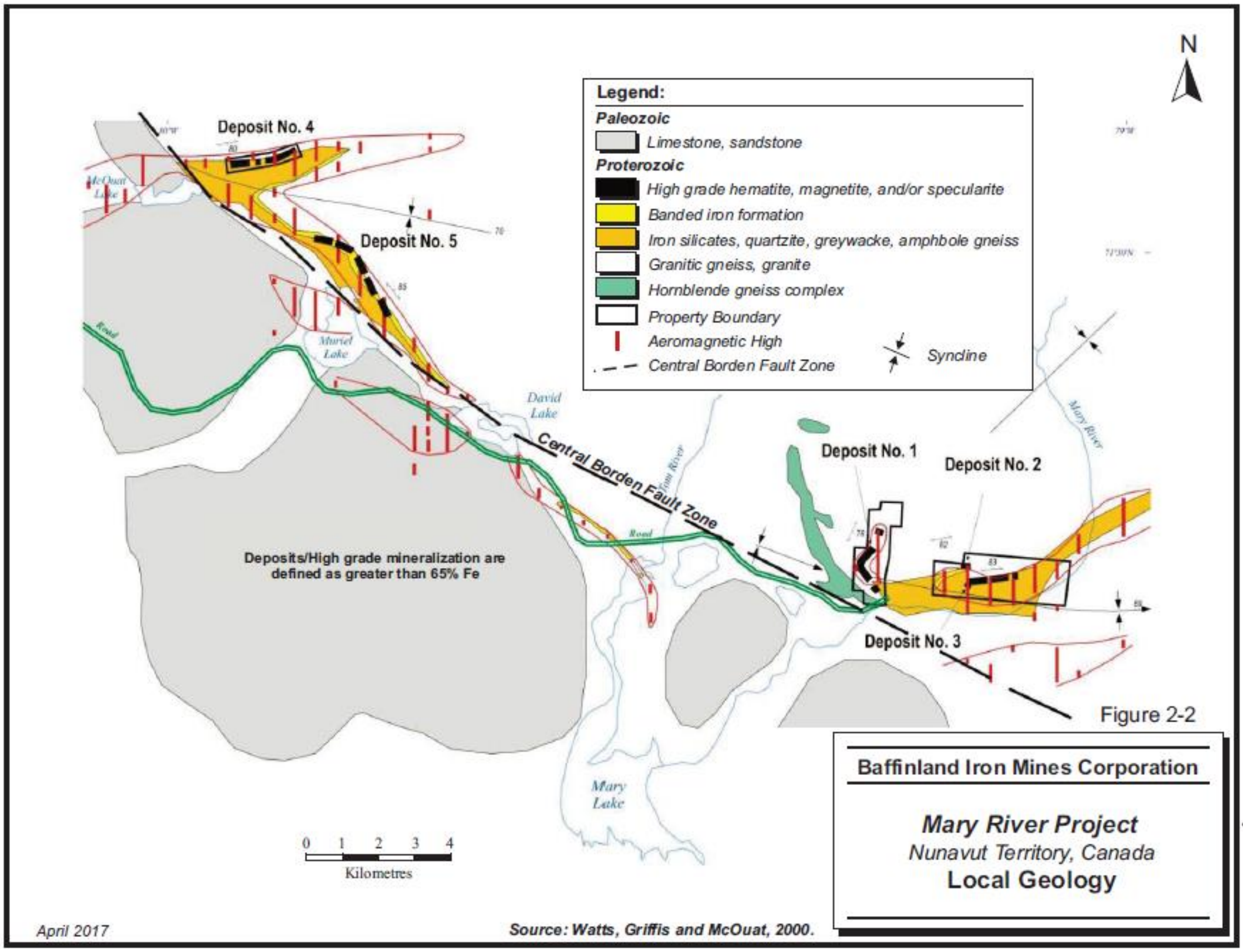
The iron formation-bearing assemblage, as outlined at Deposit No. 1, is stratigraphically underlain (to the west) by quartz-feldspar-mica gneiss (i.e., "quartz augen gneiss") with minor interleaved bands of quartz-mica schist and quartzite, and overlain (to the east) by chlorite-actinolite schist and garnetiferous amphibolite. Thin bands of chlorite-actinolite schist, staurolite-garnet-mica schist, amphibolite, and banded iron formation occur interlayered within the high-grade iron formation across the width of the high-grade iron deposits (WGM, 1964, 1965). The iron formation assemblage may be as much as 400 m thick (Iannelli, 2005).

The Mary River iron ore deposits represent high-grade examples of Algoma-type iron formation (Gross, 1996). The deposits are characterized by zones of massive, layered to brecciated hematite and magnetite, variably intermixed with banded oxide to silicate facies iron formation. They are spatially associated with a major northwest-trending discontinuity - the Central Borden Fault Zone. This crustal scale structure extends more than 200 km northwest from Angajurjualuk Lake to Milne Inlet and southern Borden Peninsula (Figure 3-2). The iron formation assemblage formed during the accumulation of the late Archean (2.76 to 2.72 Ga) Mary River Group – a diverse assemblage of originally volcanic flows, volcaniclastic, greywacke, conglomeratic and turbiditic sediments.

Field investigations by Duke (2010) suggests evidence for post-collisional extensional unroofing of the Hudsonian metamorphic terrain in north central Baffin, with keels of the Mary River Group bordering flow folded high grade gneissic domes. Duke and McCleod (2009) describe the cores of domes as interfolded Mesoarchean and Neoarchean granite-greenstone metamorphic assemblages refolded during the Hudsonian. Near contacts with the Mary River supracrustal rocks, the gneiss is interleaved with melt sheets of Hudsonian augen granite. On the contact with the Mary River lithologies these augen granite sheets exhibit strong mylonitic foliation.

Duke (2010) indicates that the high-strain mylonitic boundary conditions between the domal gneisses and keels of the Mary River metavolcanics and metasediments are attributed to extensional unroofing of the Hudsonian gneisses, facilitated by domal rises and suprastructural sinks. The flow-folding within the domes is related to Hudsonian collision which ended around 1850 Ma. The development of mylonitic fabrics post-date collision, but predate the injection of non-mylonitized pegmatite bodies that probably date about 1,780 Ma. Duke (2010) suggests a potential role for the mylonitic schist boundary in the secondary enrichment of the Mary River iron ores.

Figure 3-2 Local Geology



3.5 Property Geology

Deposits Nos. 1 through 5 are described below. Mineral resources and mineral reserves are reported in Deposits Nos. 1 through 3 only.

DEPOSIT NO. 1

Deposit No. 1 is currently the largest defined iron ore deposit in the Mary River area. The deposit has a total strike length, as defined by outcrop and magnetic anomalies, of about 3,800 m. Outcrops of high-grade iron oxides consisting of hematite and magnetite in various proportions and of specularite are exposed along the margin and crest of Nuluujaak Mountain at elevations ranging from 250 m to 700 m, over a strike length of 2,500 m. A possible additional strike of 550 m is suggested by magnetic surveys and outcrop to the south, and magnetic data indicate the continuation of the iron formation for about 750 m to the north (WGM, 1964, 1965).

Deposit No. 1 can be divided into an approximately 1,300 m long northern portion (North Limb), which strikes at 041° and dips at -77° to the southeast, and an approximately 700 m long southern portion (South Limb) which strikes at 316° and dips at -65° to the northeast (Figures 7-3 and 7-4). Minor extensions to the northeast and southeast vary locally in strike and dip. The limbs occupy the flanks of a steep northeasterly plunging syncline. Four stratigraphic lenses of high-grade mineralization are located within the fold hinge. These include from footwall to hanging wall the 100, 200, 300, and 400 zones (Figures 3-3 and 3-4).

The high-grade lower zone of oxide iron formation (coded as 100 in block model) forms a tabular 105 m to over 150 m thick body with chlorite-actinolite schist and/or garnetiferous amphibolite at the hanging wall and quartz-mica schist and quartz-feldspar-mica gneiss at the footwall. Bands of chlorite-actinolite schist with garnet and/or magnetite, banded oxide facies iron formation, and staurolite-cordierite-mica schist are rarely interlayered within the iron deposit particularly with the high-grade magnetite of the north limb. The bands are laterally continuous and average one metre to 15 m in thickness and separate the lower, middle, and upper zones. High-grade hematite-dominated iron formation predominates along the south limb and core of the synformal structure, while specularite occurs adjacent to the site where the north limb is disrupted by a north-northwest trending fault.

The iron formation along the south limb forms a 290 m thick assemblage consisting of two major sequences comprised of a lower high-grade iron formation band (up to 120 m in true thickness) overlain by a mixed zone of variably alternating high-grade iron formation, banded oxide iron formation, chlorite-actinolite schist, amphibolite and cordierite-staurolite-mica schist layers 2 m to 18 m thick. The lower high-grade iron formation band forms the surface outcrop along the crest of Nuluujaak Mountain.

DEPOSIT NO. 2

Deposit No. 2 outcrops on a ridge 2.6 km east of Deposit No. 1 (Figure 3-2). The deposit consists of dark steel to blue-grey weathered high-grade specularite iron formation outcrops up to 40 m in width and 90 m in length and can be traced for over 600 m along strike. The deposit strikes west-southwest and grades into a south to south-southeast dipping belt of banded oxide facies iron formation up to 100 m wide (Figures 3-5 and 3-6). The high-grade iron formation zone at Deposit No. 2 outcrops over an elevation of 610 m to 670 m.

Mapping, drilling results and correlation with the Mary River Group assemblage at Deposit No. 1, suggests that high-grade specularite iron formation at Deposit No. 2 stratigraphically overlies light grey pink-grey-brown weathered quartz- feldspar-mica gneiss and quartz-sericite to chlorite-amphibole-mica schist to the north and northwest.

The iron formation is overlain by a sequence of green-grey-brown to dark green weathered chlorite-amphibole-mica schist with subordinate serpentinized mafic intrusive bands and banded oxide facies iron formation, in turn overlain by banded oxide facies iron formation (with minor high-grade magnetite plus specularite iron formation; upper banded iron formation zone) which is in turn overlain by chlorite-mica-quartz-feldspar schist (to the south and south-southeast).

The strike extent of the main Deposit No. 2 appears drilled off towards the east and west. Based on occurrences of high-grade float along strike towards the west, potential exists for additional lenses of high grade along this trend for at least another 300 m.

Deposit No. 2 appears to be more complex than Deposit No. 1, in terms of continuity of high-grade iron formation and continuity of thickness. The high-grade zone reaches a maximum (true) thickness of 90 m at drill hole MR2-06-82 and grades into banded iron formation below the required DSO grade to the east and west.

DEPOSIT NO. 3

Deposit No. 3 is situated on the crest and lower slope of a ridge 670 m south of Deposit No. 2 (Figures 3-5 and 3-7). The deposit consists of high-grade hematite and specularite iron formation at an elevation of 490 m to 530 m and has a drilled strike extent of approximately 2.5 km. High-grade iron formation outcrops and float associated with a belt of Mary River Group metasedimentary and metavolcanic rocks can be traced along strike and in aeromagnetic anomaly patterns intermittently for more than 9 km east-northeast and northeast to the Glacier Lake area (Baffinland Iron Mines Ltd., 1964, 1965; Jackson et al., 1978a).

Foliation in gneiss and schist and foliation plus relict banding in high-grade iron formation at Deposit No. 3 strikes east-west and at its western extent dips -88º to the north, while at its eastern extent the dip decreases to -67º towards the north. Drilling at Deposit No. 3 has shown that at the footwall contact, high-grade specularite iron formation is in contact with chlorite-amphibole to mica-sericite-chlorite schist which in turn is in contact with a thick sequence of quartz-feldspar-mica gneiss. Comparison with the correlative stratigraphic sequence noted at Deposit No. 2 suggests that the Mary River Group succession is overturned at Deposit No. 3. Thus, the high-grade iron formation assemblage is stratigraphically overlain by silicate and/or banded oxide facies iron formation with minor chlorite-amphibole schist, which is in turn overlain by amphibolite (Jackson, 2000, 2006; Baffinland Iron Mines Ltd., 1964, 1965).

A 2006 drill hole (MR3-06-108) intersected homogeneous high grade specularite iron formation with an estimated true thickness of approximately 140 m at the western most extent of Deposit No. 3 (Figure 3-7).

Drilling in 2007, on 450 m spaced drill sections, indicated a strike length of at least 2,450 m of high grade iron formation, with the high-grade zone pinching out in thickness towards the east. At its western extent, the Deposit is interpreted to be terminated by a southwest-trending fault which is also interpreted to limit the eastern extension of Deposit No. 2 (Figure 2-5). Potential exists beyond the eastern-most extent of Deposit No. 3 for the discovery of additional targets of high-grade iron formation.

DEPOSIT NO. 4

High-grade iron formation of Deposit No. 4 outcrops on a low ridge 27 km northwest of Deposit No. 1 and three km west of the Central Borden Fault zone. In this area, exposures of high-grade magnetite and specularite iron formation occur as a series of elongated lenses or bands, 5 m to 75 m wide, that outcrop intermittently over a strike length of 2,800 m within the mine lease boundary. Due to the predominantly narrow widths encountered in Deposit No. 4 and presence of high sulphur and high phosphorus, little potential for additional tonnage is anticipated in the immediate Deposit No. 4 area. The deposit is open at depth, however, the potential in-pit waste rock contains high sulphur values.

DEPOSIT NO. 5

The 2008 airborne magnetic survey outlined an anomaly extending 21 km southeast from Deposit No. 4. Deposit No. 5 was discovered in 2009 within this magnetic anomaly and is located approximately four kilometres southeast of Deposit No. 4. Deposit No. 5 is comprised of two main hematite enriched lenses within a broader regionally continuous banded iron formation. The largest outcrop of high grade mineralization associated with the main Deposit No. 5 lens can be traced for approximately 700 m in strike length and has an exposed width of 70 m. Three additional narrow exposed intervals of enriched iron formation occur to the southeast of Deposit No. 5.

Figure 3-3 Deposit No. 1 Geology

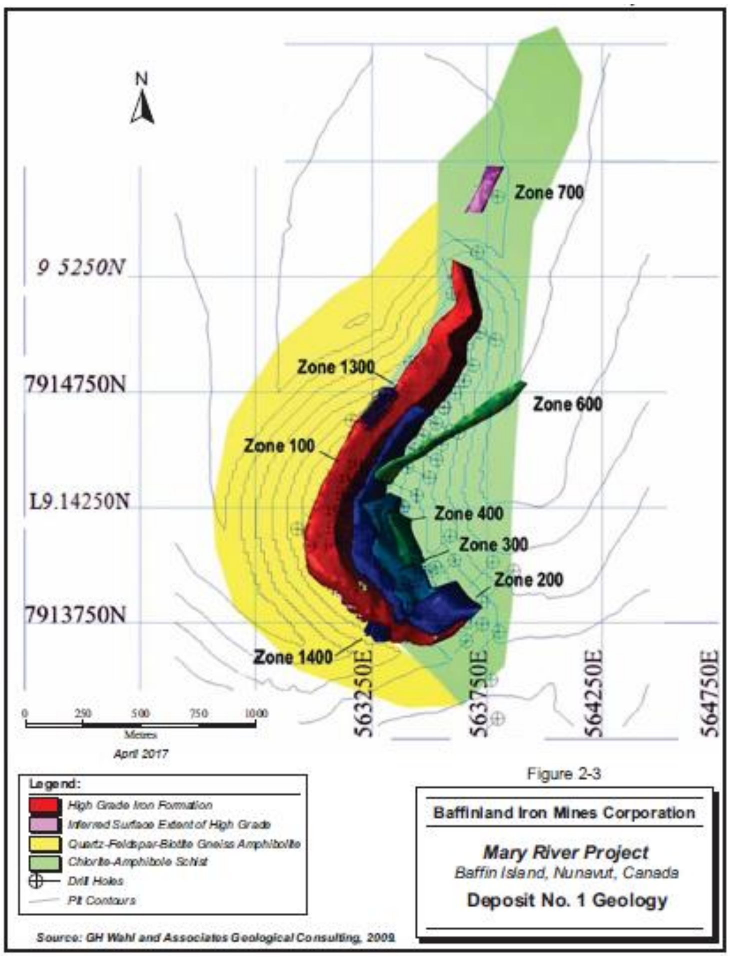


Figure 3-4 Deposit No. 1 Vertical Section

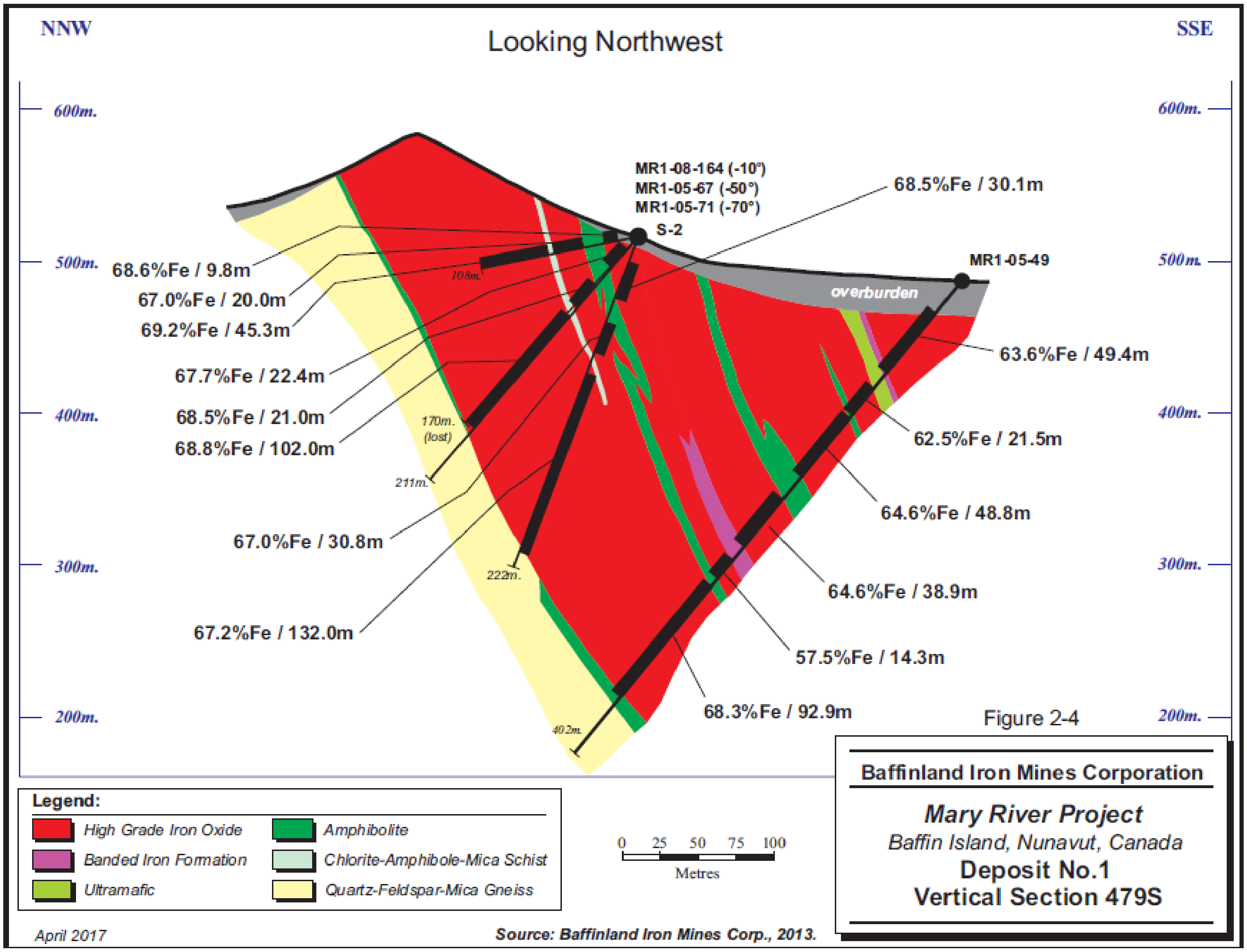


Figure 3-5 Deposit No. 2 and 3 Geology

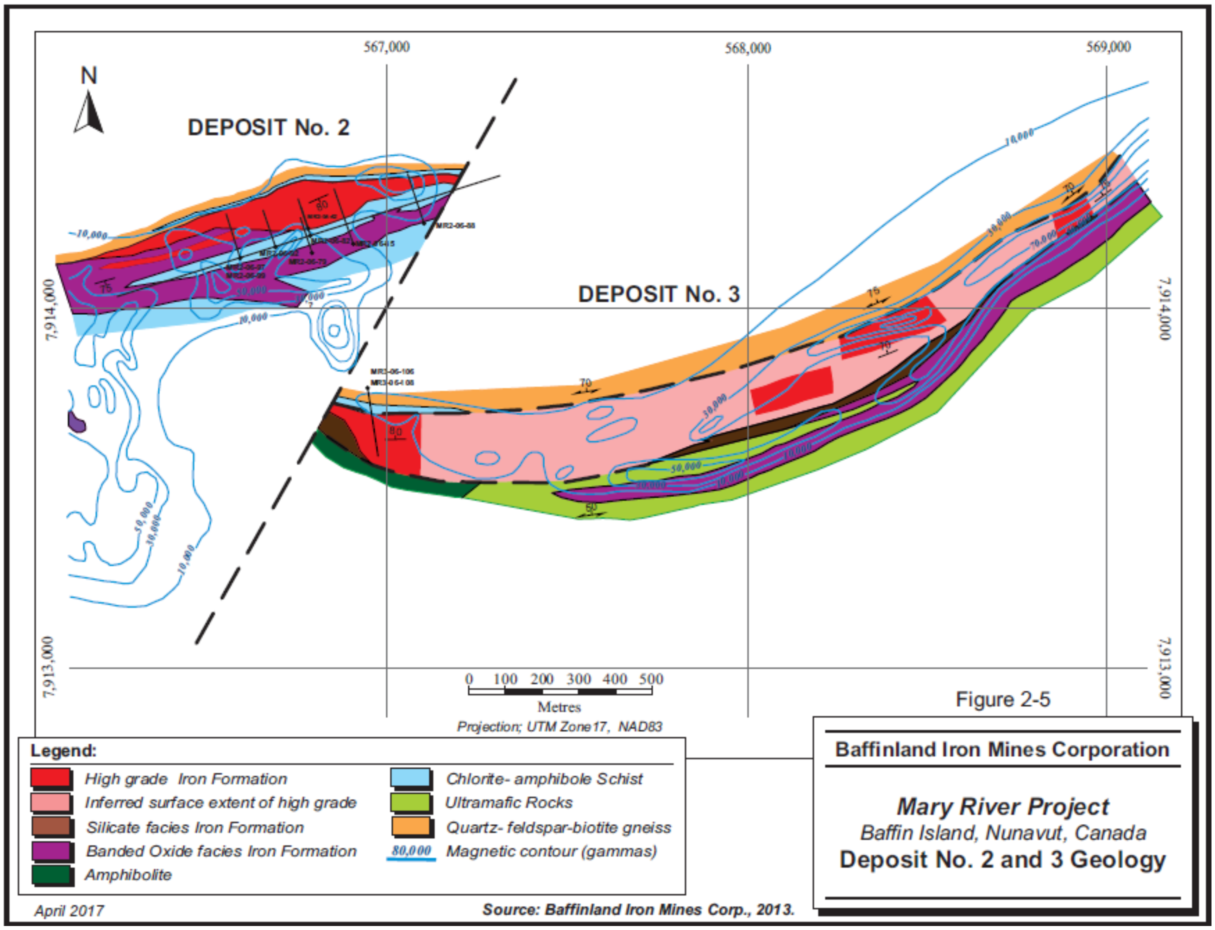


Figure 3-6 Deposit No. 2 Vertical Section

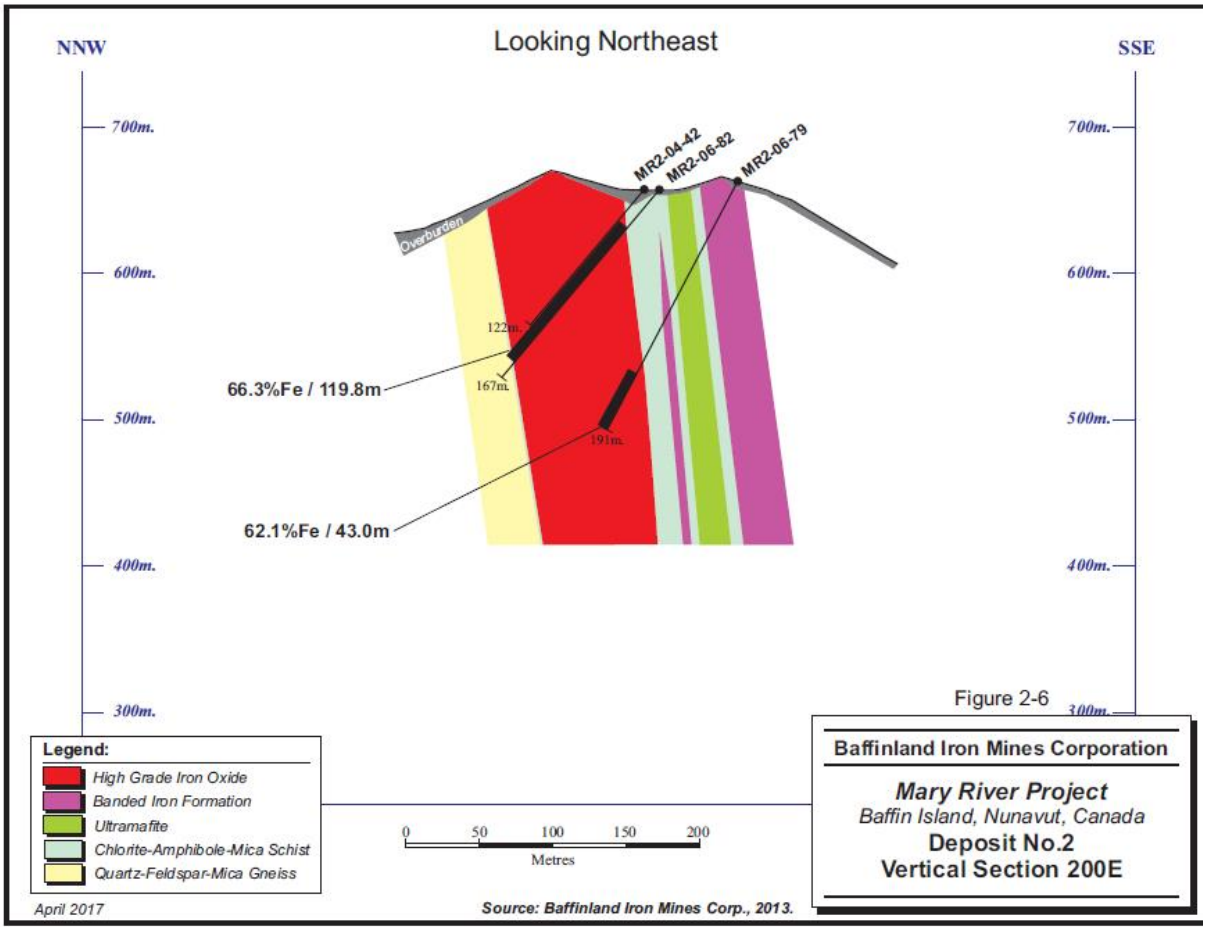
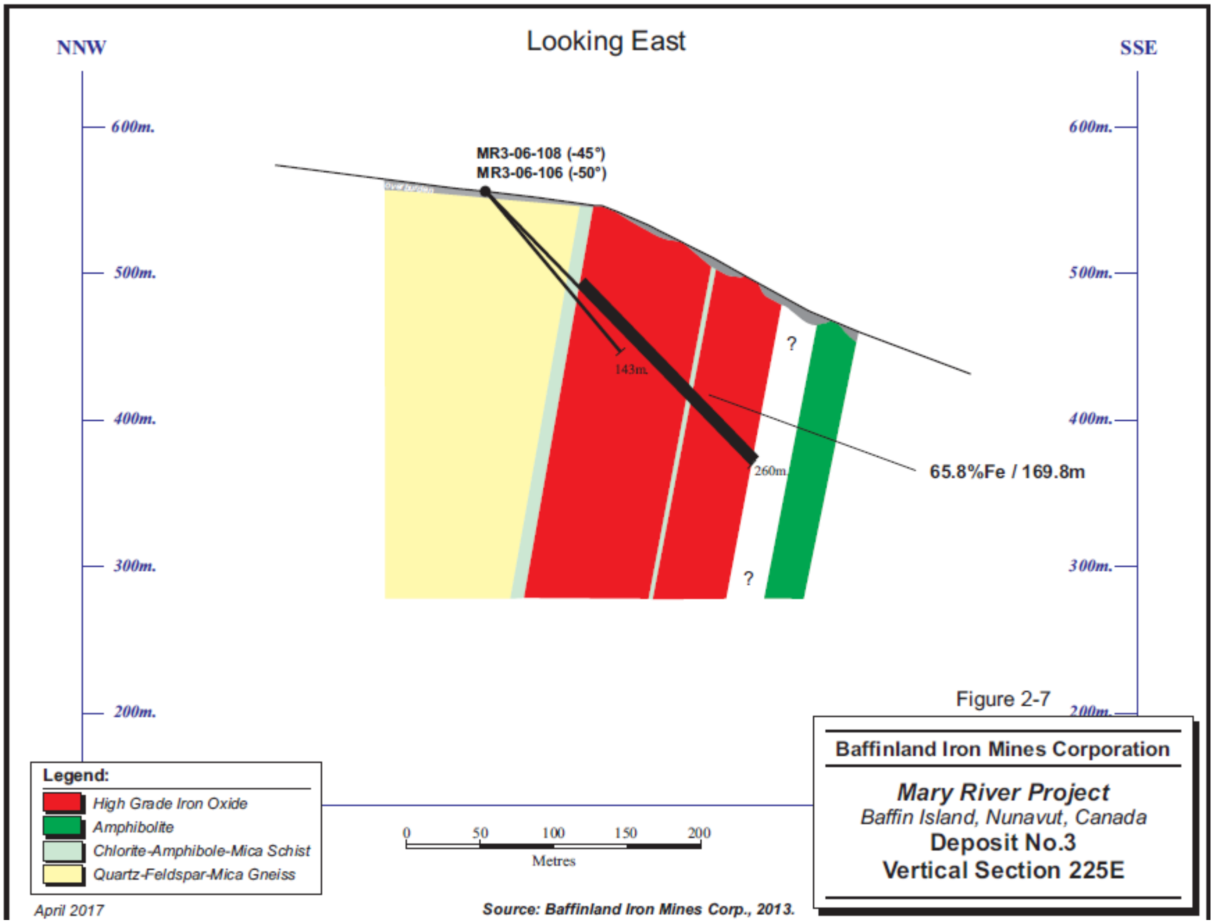


Figure 3-7 Deposit No. 3 Vertical Section



4.0 Mineralization

The Mary River deposits comprise a number of iron formations which have been enriched and altered to varying degrees. Original banded iron formations comprised of alternating layers of magnetite and hematite are preserved in several locations along strike of existing high grade deposits. The regional metamorphism and folding associated with the Hudsonian Orogeny resulted in significant crustal thickening. This period also resulted in zones of weak to strong leaching of silica. Subsequent hypogene and metamorphic events led to the alteration of magnetite to hematite and specular hematite. Surface outcrops differ in iron, silica, and sulphur content and in the proportions of their main oxide minerals – hematite, magnetite, and specularite.

The microscopic examination of drill core specimens by R.A. Blais (1964) suggested that magnetite was the stable mineral of the iron formations during metamorphism (amphibolite facies), and was replaced to various degrees by hematite (martitization), resulting in a range of hematite-magnetite (martite) compositions. This alteration process had occurred during a late stage of metamorphism, under conditions of localized stress and high oxygen pressure, and may have been associated with folding and faulting of the tabular high-grade magnetite iron formation.

The strong structural influence on channeling of oxidizing solutions is supported by the alignment of lineations produced by tubular pores in the hard, high-grade hematite iron formation (i.e., parallel to the axial plane and plunge of the synform) and the concentration of high-grade hematite at the core of the fold.

Euhedral specularite crystals in magnetite rock indicate that specularite did not form by a process similar to martitization, but through the possible metamorphic replacement of magnetite. It is also possible that the specularite and other hematite mineralization formed as a primary rather than secondary mineral. What caused the crystallization of flaky, course-grained specularite as compared to fine-grained massive hematite, however, is not fully understood. Field evidence suggests that higher fluid or vapour pressures in zones of shearing may have facilitated the growth of specularite.

4.1 Deposit Types

The Mary River deposits can be described by the depositional model proposed for Algoma-type iron formation. The characteristic stratigraphy for Algoma-type iron formations consists of a lower succession of typically intermediate volcanic rocks interbedded with acid volcanic rocks, volcaniclastic sedimentary rocks, and their sedimentary derivatives. These units are followed by banded iron formation comprised of alternating cherty bands and iron oxides or bedded or banded pure oxides ranging from metres to hundreds of metres in thickness depending on depths of original basins. The iron formation is then overlain by a sequence of volcanic and volcaniclastic sedimentary rocks commonly intruded by ultramafic and granitic intrusive bodies.

Mary River Group greenstone belts across northern Baffin Island consist of variable amounts of banded iron formation associated with metasedimentary, metavolcanic, and meta-igneous rocks (Jackson et al., 1978a, b, c; Jackson and Morgan, 1978). The banded oxide and silicate facies iron formations comprise the lateral equivalents of the high-grade Mary River deposits, which are almost entirely composed of iron oxides suggesting a significant enrichment of iron through secondary processes.

Duke (2010) indicates growing evidence for a secondary iron enrichment mechanism associated with widespread retrograded mylonitic detachment faults along the base of the high grade and enriched BIF across north central Baffin Island in places such as the Mary, Turner, Cockburn, and Rowley River areas. These detachment faults are marked by a chlorite retrograded mylonitic structural contact between underlying ductile rising domes of poly-deformed mafic-felsic gneisses and overlying supracrustal sinking keels which host the Mary River iron deposits (Duke and Macleod, 2009). These detachment faults are thought to be post regional folding of the Hudsonian orogeny around 1,850 Ma (Duke, 2010).

The high grade massive and enriched iron oxide deposits occur where Mary River BIF borders directly on detachment schist that separates the mylonitic roof of infrastructural domes from the high strained keels of Mary River Group. At detachment schist contacts, magnetite BIF shows evidence of having undergone extreme pressure solution resulting in the highly efficient leaching of quartz from quartz-magnetite BIF. In large deposits, the primary banding defining early isoclinal folding is completely destroyed by metamorphic differentiation and recrystallization, resulting in greater than 100 m thicknesses of massive magnetite/hematite. On the flanks of the high-grade iron deposits, iron enrichment is marked by various degrees of silica loss due to continued silica removal.

Several regional examples of exposed giant quartz veins occurring along detachment schist boundaries adjacent to high grade magnetite zones account for the removal of silica from the banded iron formations. Duke (2010) suggests that the hydrothermal removal of silica was likely facilitated by dewatering of the nearby footwall serpentinized komatiites.

5.0 Exploration

The following is taken from the Wahl and Gharapetian reports (2009 and 2011).

Commencing in 2002, the newly formed BIM group reassembled and reviewed all available data and made plans for the 2004 summer season.

In 2004, equipment was moved to site and a new camp was established. Drilling by BIM in 2004 focused on extending the northern and southern extents of mineralization previously defined by WGM drilling on Deposit No. 1. A total of 2,813 m of drilling in 15 holes produced 832 assay samples or 1,497 m of split core samples. The 2004 drill program increased the explored length of the Deposit No. 1 to over 2,700 m and confirmed a vertical extent to 400 m. A new northeastward trending limb was discovered above the hanging wall.

The first drill hole (MR2-04-42) drilled into Deposit No. 2 intersected approximately 85 m true width of high-grade iron formation indicating that further drilling on Deposit No. 2 was warranted. A further seven metallurgical samples were collected from core and two metallurgical samples from outcrop in Deposit No. 2 were forwarded to Studien-Gesellschaft für Eisenerz-Aufbereitung (SGA) in Germany for testwork.

In 2004, a total of 68 composite samples (60 kg to 120 kg) were collected from the remaining drill core and forwarded for metallurgical testwork at SGA in Germany. Each composite represented approximately a 14 m to 16 m drill core interval. Results of this testwork are discussed in later sections of this report.

In 2005, 34 holes were completed for a total of 8,073 m. On Deposit No. 1, a total of 2,621 samples representing 5,216 m of split core were sent for assay. The drill program was largely aimed at testing the depth extent of Deposit No. 1 to delineate the footwall contact. Drilling in Deposit No. 1 demonstrated that the surface widths encountered by WGM extended to approximately 600 m in depth with no indication of pinching out at depth. An additional 135 metallurgical composites collected from Deposit No. 1 drill core were dispatched to SGA in Germany for metallurgical testwork.

Another 15 metallurgical samples from surface outcrops on Deposit No. 1 were also forwarded to SGA in Germany. An aerial topographic survey was completed by Eagle Mapping Services to produce a digital terrain map of the area covering Deposit Nos. 1, 2, and 3.

A resource estimate was prepared in 2006 as part of a scoping study completed by Aker Kvaerner. The resource estimate incorporated the WGM drilling results along with BIM's 2004 and 2005 drilling results. A total of 309 Mt of Indicated Mineral Resources at a grade of 66.1% Fe and 28 Mt of Inferred Mineral Resources at a grade of 65.9% Fe were estimated. This resource estimate is now superseded as a result of infill and extension exploration drilling completed since 2005.

Exploration work in 2006 included drilling on Deposit Nos. 1, 2, and 3. A total of 4,135 m in 22 holes were drilled on Deposit No. 1 which included exploration, infill drilling, as well as geotechnical drilling for pit walls. Thirteen holes were focused on the north limb, one on the south limb, four on the fold hinge and the remaining four holes were comprised of geotechnical pit wall holes. A total of 1,276 samples were collected representing 2,513.70 m of sample from 18 exploration drill holes. Channel sampling in 2006 comprised of 12 samples or 67 m on Deposit No. 1. Metallurgical mapping of Deposit No. 1 continued with a combined total of 209 samples forwarded to Germany by the end of 2006.

In 2006, 1,172 m were drilled in seven holes on Deposit No. 2 and 118 samples were collected from 232 m of split core from three drill holes. One of these three holes, MR3-06-108, intersected 169.8 m of massive high grade specular hematite, suggesting a true thickness of at least 140 m at the western extent. A total of 636 m were drilled in three holes on Deposit No. 3. Seventeen core samples were submitted from Deposit No. 2 and an additional 10 core samples from Deposit No. 3 were submitted for metallurgical testwork.

In 2007, BIM completed 4,392 m of drilling on Deposit No. 1, which includes both geotechnical and exploration drilling. This drill program was comprised of three bulk sample pilot test holes on the north limb, a further three infill holes on the north limb, three holes on the south limb infill, ten holes into the fold hinge and three geotechnical-specific holes. An additional 87 core samples from 2006 were submitted for metallurgical testwork.

In 2007, eight additional holes were drilled at Deposit No. 3 for a total of 1,918 m on 450 m step outs. A total of 578 m of core was sampled representing 293 samples. A further eight channel samples for a total of 82 m were collected in 2007. The drill program was successful in defining an inferred resource over a 2,450 m strike length.

Geotechnical drilling was also undertaken at the Milne Inlet and Steensby port sites, as well as along the Steensby railway alignment, intended to support project permitting and basic engineering, which was a new focus of the 2007 drilling program.

Exploration drilling in 2007 and 2008 on Deposit No. 1 targeted the upper 250 m of the deposit, in order to provide metallurgical material, upgrade inferred resources and to obtain a more complete deleterious database for the upper portion of deposit. This program was only partially completed in 2008 and continued in 2009.

In 2008, a total of 5,071 m were drilled in 27 infill holes. This program was to improve the confidence level of the upper 250 m of the Deposit No. 1. Drill results indicated a more localized control on deleterious elements and also indicated in some locations a greater thickness of near surface high grade iron formation than had been previously interpreted.

The 2008 geotechnical drilling included 315 holes along the railway corridor, 64 holes at the Steensby port location, 33 holes at quarry and tunnel locations along the railway corridor, and 30 infrastructure holes at the proposed Mary River mine site location.

For the 2008 metallurgical testwork program, a further 54 metallurgical samples from 2007 drill core were sent to SGA for Deposit No. 1 and another 23 core and outcrop samples for Deposit No. 3 from the 2007 exploration program.

In February 2008, BIM announced an updated mineral resource and mineral reserve statement for the Mary River Property. Deposit No. 1 was estimated to contain approximately 160 million tonnes of proven reserves at an average grade of 64.4% iron, plus probable reserves of approximately 205 million tonnes at an average grade of 64.9% iron. Mineral resources totalled 400,000 tonnes of Measured Mineral Resources, 52 million tonnes of Indicated Mineral Resources, and 448 million tonnes of Inferred Mineral Resources (all exclusive of mineral reserves) on Deposit Nos. 1, 2, and 3. These estimates have been superseded by subsequent estimates.

In February 2008, the results of a definitive feasibility study, managed by Aker Kvaerner E&C, on Deposit No. 1 (the DFS) were released. The DFS is a detailed study of the technical and economic feasibility of Deposit No. 1 and was based on proven reserves of 160 million tonnes and probable reserves of approximately 205 million tonnes. The DFS indicated that, based on the shipment of 18 million tonnes of ore per year to the European market, the proven and probable reserves could sustain a mine life of over 20 years. Assuming CFR Steensby Inlet and average sale prices of US$67 per tonne for lump ore and US$55 per tonne for fines, the DFS indicated that the mine could generate a pre-tax internal rate of return of 20.5%, with a payback period of 3.7 years, and an after-tax internal rate of return of 15.9%. The DFS forecasted pre-tax cash flow over the life of the mine to be $18.1 billion, with after-tax cash flow of $11.2 billion.

The DFS estimated the initial capital costs for the project to be $4.1 billion, including all direct and indirect costs, contingencies and owner's costs. Sustaining capital was estimated to be $400 million over the life of the project, including project reclamation and closure costs. Operating costs for all of the facilities were estimated to be $14.62 per tonne, excluding taxes and financing costs.

In July 2008, the company revised its bulk samples targets from 250,000 tonnes to a range of 120,000 to 150,000 tonnes. This target was revised due to the advent of an earlier than anticipated spring melt combined with severe rainfall in the later part of June resulting in a need for extensive construction and maintenance work along the full length of the 100 km tote road to the shipping site at Milne Inlet. Haulage of the bulk sample on this road at the time had been interrupted for approximately nine weeks and resumed in late July 2008.

By November 2008, three shipments of the iron ore bulk sample arrived in Europe. The first trial cargo of lump iron ore was shipped to the port of Vlissingen in the Netherlands for ThyssenKrupp. The trial cargo weighed approximately 54,464 tonnes by draft survey at the discharge port and the lump iron ore graded more than 68% iron with low moisture content of 1.28% and low levels of deleterious elements. The undersize (less than 6.3 mm) portion of the cargo was 3.4% of the cargo weight.

The second trial cargo of lump iron ore discharged approximately 31,050 tonnes at the port of Bremen, Germany for ArcelorMittal Bremen. This trial cargo also graded more than 68% iron with low moisture of 1.26% and low deleterious elements. The undersize portion of the cargo was 4.2%.

The third and final trial cargo was discharged at the port of Vlissingen in the Netherlands for ThyssenKrupp. This trial cargo weighed approximately 27,701 tonnes and graded more than 66% iron with moisture content of 3.32%.

The bulk sample open pit was selected to mine and ship lump iron ore that was representative metallurgically of what would be shipped in the initial 10 to 15 years of production. The three trial cargos of Mary River iron ore were consumed in the blast furnaces of ArcelorMittal and ThyssenKrupp in 2009.

In October 2008, 18 mineral claims totalling approximately 32,016 acres (12,956 ha) were staked. The claims surround Deposit No. 4 and cover prospective stratigraphy to the southeast.

In November 2008, New-Sense Geophysics Ltd released results from a high resolution magnetic airborne geophysical survey. The survey was based on 200 m spaced regional traverses with 100 m infill lines surrounding the known deposit areas. A total of 6,184.9 line km of survey were flown. The survey outlined additional stratigraphic targets in the vicinity of Deposit No. 4 as well as targets to the east and west of Deposit No. 3.

In 2009, enriched iron oxide mineralization was identified on the recently staked claims southeast of Deposit No 4 forming what is now referred to as Deposit No. 5.

During the summer of 2009, BIM drilled another 2,317 m on the south limb of Deposit No. 1 to better define the southeastern extent of mineralization. The previously interpreted extent of mineralization was confirmed with a decrease in thickness and a gradational increase in banded iron formation with depth.

In 2010, BIM drilled three holes for a total of 483 m on Deposit No. 2, 162 m in two holes on Deposit No. 3, a total of 3,165 m in 17 holes on Deposit No. 4, and 2,662 m in 20 holes on Deposit No. 5. An additional three holes were drilled to determine waste rock acid generation properties on Deposit No. 1.

In 2010, Baffinland was acquired by ArcelorMittal and Iron Ore Holdings. Since that time, various technical and economic studies have been completed, including:

- Mary River Project – Early Revenue Report (ERP); BIM; December 24, 2012
- Baffinland Mary River Trucking Feasibility Study; AMEC; December 2010
- Mary River Iron Ore Trucking Feasibility Study Update; AMEC; March 21, 2013
- FEL 3 Report for Mary River Project; Hatch; April 30, 2012

Work in the 2010 field season included diamond drilling on Deposit Nos. 1, 2, 3, 4, and 5. Regional exploration led to the discovery of Deposits 6, 7, 8, and 9. In 2010, BIM also completed an updated resource estimate on Deposit No. 1.

5.1 Drilling

The BIM exploration drill hole database comprises WGM exploration data completed in the 1960s as well as several years of exploration by BIM. Tables 5-1, 5-2, 5-3, 5-4, and 5-5 summarize the exploration database completed on Deposit Nos. 1, 2, 3, 4, and 5 to the end of 2010. For type of sampling, DDH refers to diamond drill core holes and CHA refers to trench channel sampling.

Table 5-1 Drilling and Channel Sampling at Deposit No. 1
Baffinland Iron Mines Corporation – Mary River Project

Year	*Company*	*Type*	*No. of Holes/Channels*	**No. of Metres**
1964	WGM	DDH	26	3,318
2004	Baffinland	DDH	12	2,350
2005	Baffinland	DDH	34	8,393
2006	Baffinland	DDH	22	4,136
2007	Baffinland	DDH	22	4,492
2008	Baffinland	DDH	27	5,071
Total			**143**	**27,760**
1963	WGM	CHA	208	1,023
2006	Baffinland	CHA	12	67
Total			**220**	**1,090**

Table 5-2 Drilling and Channel Sampling at Deposit No. 2
Baffinland Iron Mines Corporation – Mary River Project

Year	***Company***	***Type***	***No. of Holes/Channels***	No. of Metres
2004	Baffinland	DDH	1	122
2006	Baffinland	DDH	7	1,193
2010	Baffinland	DDH	3	483
Total			**11**	**1,798**
1963	WGM	CHA	22	130

Table 5-3 Drilling and Channel Sampling at Deposit No. 3
Baffinland Iron Mines Corporation – Mary River Project

Year	***Company***	***Type***	***No. of Holes/Channels***	No. of Metres
2006	Baffinland	DDH	3	636
2007	Baffinland	DDH	8	1,918
2010	Baffinland	DDH	2	162
Total			**13**	**2,716**
1963	WGM	CHA	19	97
2007	Baffinland	CHA	8	82
Total			**27**	**179**

Table 5-4 Drilling and Channel Sampling at Deposit No. 4
Baffinland Iron Mines Corporation – Mary River Project

Year	**Company**	**Type**	**No. of Holes/Channels**	**No. of Metres**
2010	Baffinland	DDH	17	3,165
1963	WGM	CHA	32	191
2010	Baffinland	CHA	43	91

Table 5-5 Drilling and Channel Sampling at Deposit No. 5
Baffinland Iron Mines Corporation – Mary River Project

Year	Company	Type	No. of Holes/Channels	No. of
2010	Baffinland	DDH	20	2,662
2010	Baffinland	CHA	87	185

The BIM drilling was completed using mainly HQ (core diameter 63.5 mm). Drill hole collars were surveyed on an ongoing basis. Down hole surveys are completed using a Maxibor instrument which collects direction and inclination data for the entire length of the hole. Where drilling became difficult, holes were reduced to NQ equipment (core diameter 47.6 mm). Drilling was completed using Longyear L-38 and LM-30 modular rigs.

Drill core recoveries generally ranged from 92% to 99% for the BIM drilling (Table 5-6) and were found to be appropriate for resource estimation. Occasional intervals of poor recovery were a result of broken or fragmentary hematite or magnetite generally related to apparent zones of faulting or shearing; friable, porous hematite within the fold axis; or fractured or brecciated waste rock above the hanging wall.

Table 5-6 Average Drill Core Recoveries
Baffinland Iron Mines Corporation – Mary River Project

Year	Company	Recovery %
2004	Baffinland	99
2005	Baffinland	96
2006	Baffinland	95
2007	Baffinland	92
2008	Baffinland	98
2010	Baffinland	98
1964	WGM	88
1965	WGM	70

5.2 Sample Preparation, Analyses and Security

5.3 Sampling Method and Approach

WGM 1964-1965

The notes on WGM sampling are adapted from von Guttenberg and Farquharson, 2003.

Core from the WGM 1964-65 drilling programs at Deposit No. 1, with visible iron oxides, was split longitudinally with one-half stored at Mary River and the other half shipped for assaying to Technical Service Laboratory (TSL) in Toronto, or to Warnock Hersey Company Limited in Montreal. Initially, core containing little waste material was sampled and assayed in six metre lengths. Later the sample length was reduced to three metres and different types of iron ore and bands of waste were sampled and assayed separately. A total of 701 samples with a combined length of 2,728.57 m from 25 drill holes were assayed, with lengths of individual samples varying from 0.3 m to 16.8 m, with an average of 3.9 m. The core samples show no bias and reflect the entire iron ore zone thickness.

Surface chip and trench samples collected during the 1964 to 1965 WGM programs were taken on sections perpendicular to the strike of the deposits. The sample weight was approximately 0.5 lb/ft (745 g/m).

Deposit No. 1 was channel sampled at approximately 150 m sectional spacing. Deposit No. 2 was channel sampled at approximately 50 m intervals where outcrops permitted over a strike length of 335 m. Deposit No. 3 was channel sampled in only two general areas of outcrops spaced approximately 1.5 km apart.

The surface samples at Mary River provide a limited representation of the composition and distribution of iron oxides in the underlying deposits. Surface sampling is limited by outcrop exposure which only provides a limited exposure of the true thickness of the cross strike extent of the iron formation.

BIM 2004-2010 EXPLORATION CAMPAIGNS

The principal sampling method employed in 2004 to 2010 by BIM was core drilling which was contracted to Boart Longyear Inc. Drilling on Deposit No. 1 was designed to achieve a drill hole spacing of 75 m along strike and down dip. Deposit No. 2 is currently drilled at 100 m spacing, while drilling on Deposit No. 3 is up to 450 m spacing between drill sections.

The HQ-sized drill core was logged and two metre sample lengths were marked for sampling and assaying. Sample lengths were less than two metre when intervals were encountering changes in lithology. The core was cut using a diamond saw. In addition to sampling the mineralization, samples were also collected for internal waste, hanging wall and footwall zones, and adjacent banded iron formation to assess the grade impacts of waste deleterious elements and dilution. Remaining core samples were stored in core boxes on site for future reference or for metallurgical testwork. Sample mass for HQ sized core ranged from 11 kg to 15 kg. Sample mass for NQ sized core ranged from 6 kg to 7 kg.

Drill core logging captured major and minor rock types, core recovery, rock quality distribution, presence of sulphides and structure. Geological core logging entered directly using laptops. Core was photographed prior to sampling.

Channel samples were cut with a diamond saw and sample volume per metre roughly equated that of HQ diameter core. A limited amount of surface channel sampling was completed on Deposits No. 1, No. 2 and No. 3 by BIM. Some channel sample composites weighing approximately 200 kg each were sent for metallurgical testwork.

5.4 Sample Preparation and Analysis

WGM 1964-1965

The following descriptions of WGM sample preparation and assaying were adapted from von Guttenberg and Farquharson (2003) and from Wahl and Gharapetian (2009).

In 1964, assays on chip and trench samples from the Mary River deposits for total iron, phosphorous and sulphur were completed by standard wet chemical procedures. Silica, alumina, manganese, and titanium were determined by spectrochemical methods with an accuracy of ±5%.

Samples of half core were crushed to -6 mm in a steel-plate crusher, a 300-g split of the crushed sample was pulverized to -10 mesh (1.7 mm), and 5 g was assayed for soluble iron, silica and sulphur by wet chemical methods. For an accurate identification of ore types, a 100 g split of the -10 mesh material was used for standard Davis Tube analysis, which was the main analytical procedure used to classify the samples based on their hematite-magnetite content.

To chemically characterize the iron ore types separated by core logging and Davis Tube tests, 45 composite samples from 10 holes drilled in 1964 were analyzed for soluble Fe and for SiO_2, Al_2O_3, MnO, TiO_2, CaO, MgO, S, P, and loss on ignition (LOI). Composites of these samples were analysed for 50 elements by spectrography.

Based on composite samples, assays from the 1964-65 drilling programs by spectrography and whole-rock analysis by Technical Services Laboratories (TSL) and Superior Laboratories (SL), and other elements or oxides, such as Al_2O_3, Cu, Pb, Zn, Mn, Ti, V, Na, and K all occur in amounts which would not affect the marketability of the iron ore.

The analytical work showed that iron levels and accessory elements generally fell within acceptable limits for lump iron ore in all composites, except waste-rock units. Sulphur in five composites exceeded 0.05%, and four magnetite-rich composites carried phosphorus in excess of 0.04%.

Comparative assaying was the only quality control measure discussed in the reports, from 1963 to 1965, describing the assaying of core and surface samples, and no original laboratory reports for that period are available. The laboratories used for assaying of core, surface and metallurgical samples in 1963 to 1965 were not certified which was not unusual at that time.

The areas of concern related to the analytical work from that period, which may influence the quality of the resource, are the accuracy of the sulphur assays and the determination of the magnetite content by the Davis Tube magnetic separator.

In general, the sampling methodology, sample preparation, and analytical procedures were adequate for the definition of the Mary River mineralization.

BIM 2006 TO 2010

Sample preparation of split core was completed at SGS laboratories in Sudbury, Ontario. Prepared pulps were then forwarded to SGS in Lakefield for assay.

Preparation of samples included a primary crush of the sample to -43 mm. This was followed by a secondary crush to -34 mm. Samples were then screened at 6.3 mm, weighed and recombined.

Samples were then riffle split to 500 g for tertiary grinding and pulverizing. A tertiary crush of the 500 g split to -3 mm completed the assay preparation.

In 2005, the secondary crush to -34 mm was eliminated since analysis of screened fractions completed by SGA in Germany showed little or no variance. The elimination of the secondary crush also provides a more representative assessment of the lump ore percentage.

Analytical procedures were as follows:

- H_2O Determination of moisture content by heat and weight loss
- Fe Total iron by potassium dichromate titration
- FeO Non-oxidation leach, followed by dichromate titration
- Cl UV spectrophotometry
- S Total sulphur by Leco carbon sulphur analyser

Whole rock analysis was carried out to determine SiO_2, Al_2O_3, P_2O_5, Na_2O, TiO_2, V_2O_5, CaO, MgO, K_2O, and MnO. The method was borate fusion followed by X-ray fluorescence. The detection limit for all elements was 0.01%, except for Na_2O and K_2O which was 0.05%.

Loss on Ignition (LOI) was determined by high temperature weight loss.

Minor and trace element determinations were made by inducted coupled plasma (ICP) spectrometry, using acid digestion. A suite of ICP analyses was also evaluated to see if any elements were potentially problematic. Table 5-7 of raw assay data from the 2004 and 2005 drill program indicate that most of these deleterious elements are either below the detection limit or proximal to the detection limit, suggesting that they are not present in sufficient quantities to negatively affect ore quality.

Table 5-7 Detection Limits and Mean Grades of Deleterious Elements
Baffinland Iron Mines Corporation – Mary River Project

Grade Parameter	Units	Detection Limit	Mean
As	g/t	<40	BD
Ba	g/t	<.5	5.84
Bi	g/t	<60	BD
Cd	g/t	<10	BD
Co	g/t	<10	25.16
Cr	g/t	<4	18.12
Cu	g/t	<0.5	15.1
Mo	g/t	<10	BD
Sn	g/t	<20	BD
Tl	g/t	<30	BD
Zn	g/t	<50	BD
Na_2O	%	<0.002	0.007
TiO_2	%	<0.01	0.04
V_2O_5	%	<0.01	BD
CaO	%	<0.01	0.4
K_2O	%	<0.003	0.01

BD = Below Detection Limit

Elements and oxides that are analyzed at elevated quantities locally within the Mary River deposits include MnO, MgO, P_2O_5, S, and Al_2O_3.

For the purposes of resource estimation, MnO% and P_2O_5% in the assay certificates were recalculated by Wahl and Gharapetian (2011) to provide Mn% and P% values in the BIM database.

5.5 Quality Control and Quality Assurance

SGS is accredited by the Standards Council of Canada (SCC) for specific mineral test listed on the scope of accreditation to the ISO/IEC 17025 standard. ISO/IEC 17025 addresses both the quality management system and the technical aspects of operating a testing laboratory.

Quality control procedures by SGS include duplicate samples, replicates, reagent/instrument blanks, preparation control samples, certified reference material analysis and instrument control samples. After analysis, results were sent electronically by SGS to BIM offices in Toronto. Signed certificates were later forwarded by mail. Pulps were retained in storage at SGS for future reference as required.

5.6 Sample Security

Sample security was achieved by BIM by restricting access to samples on-site, by carrying out rigorous sample tracking, and by using tamper-proof packaging and secure shipment routes. All samples were air-shipped in sealed containers to SGS laboratories in Sudbury. No evidence of tampering of samples was encountered. Sample assay values forwarded to different laboratories returned similar values.

5.7 Data Verification

WGM 1964-65 DATA

Only limited assay and database verification work was completed by WGM during its exploration programs in 1964 and 1965.

Previous validation of the WGM assay database was comprised of sending a small number of samples to external laboratories. Table 5-8 shows seven results from this WGM duplicate testwork program. Although too few samples to reliably reflect the quality of the WGM assay database, the results suggest that the WGM Fe and SiO_2 grades for the seven samples could be reasonably reproduced at external laboratories.

Table 5-8 WGM Comparative Analysis
Baffinland Iron Mines Corporation – Mary River Project

Sample No.	Tech Serv. Lab.		Lakefield		Steep Rock		Superior	
	Fe (total)	SiO_2	Fe (total)	SiO_2	Fe (sol.)	SiO_2	Fe (sol.)	SiO_2
14	69.97	0.13	68.65	0.78	70.68	0.24	69.46	0.51
24	70.17	0.20	68.88	0.07				
35	70.87	0.54	69.67	0.88				
42	71.26	0.09	70.18	0.30	70.05	0.20	71.30	0.20
47	69.48	0.22	68.82	0.52				
54	71.93	0.15	70.69	0.24	72.17	0.21	71.42	0.31
57	70.06	0.11	69.33	0.46				

(Source: WGM Engineering Report #3 Volume 1, 1965)

To check the quality of assaying by TSL, a set of length-weighted composite samples of minus 10-mesh rejects from the same 10 drill holes that were re-assayed by TSL and SL for Fe, P, SiO_2, Mn, Al_2O_3, CaO, MgO, S, TiO_2 and LOI.

The TSL and SL composite assays showed generally good agreement for most elements with TSL reporting generally slightly higher values, and phosphorous having the largest variation.

The iron assays compared reasonably well, with some negative bias seen in the composite averages for SiO_2. Sulphur had a significant amount of scatter in the individual assays. Of more concern was the lack of standards which would allow an assessment of the accuracy of the assay methods. This particularly affects sulphur, which can occur at levels critical for the marketability of the iron ore, although its absolute concentrations are low. There is also concern regarding the phosphorous precision and accuracy.

In order to address the shortcomings of the 1960s era deleterious dataset, BIM commenced a drill program in 2005 to entirely replace this dataset.

BIM 2004- 2010 DATA

Data verification completed by Wahl and Gharapetian (2009 and 2011) consisted of data entry validation, analysis of available external duplicate data, analysis of twinned holes, checking the results of SGS's internal quality control, checking the quality of core logging and sampling protocols, comparisons of drill campaign results via quantile plots, and validating of drill hole collar locations.

The drilling/sample database used for resource estimation was obtained from BIM as MS Excel files that were imported in Surpac Mining software. These data files were examined both visually and statistically. Any issues that arose during data import were raised with BIM personnel, corrected, and rechecked.

A variety of adjustments were made as data was imported into Surpac. Collar file coordinates were cross-checked with recent drill-hole collar survey files provided by BIM. WGM drill-hole location maps were imported and cross-referenced with the most recent survey data as a secondary check. Drill-hole collar elevations were also cross-referenced against the most recent Lidar topographic survey.

Approximately 5% of the electronic drill-hole assay database was checked against original assay records for data entry errors. Although assay certificates for the WGM drilling were no longer available, original assay tables were used to check data entry.

Drill logs and drill core from the WGM drill campaign were no longer available for verification purposes. During data input, assay intervals were checked and corrected for overlapping samples, and data entry errors.

SGS completed all of BIM's primary assay work for the 2004 to 2010 exploration programs. SGS is accredited by the Standard Council of Canada (SCC) for specific mineral tests listed on the scope of accreditation to the ISO/IEC 17025 standard. ISO/IEC 17025 addresses both the quality management system and the technical aspects of operating a testing laboratory. SGS documentation provided by BIM indicates that SGS also participates in round robin reference material certification programs.

SGS INTERNAL BLANK, DUPLICATE PULP AND STANDARD RESULTS

SGS's internal quality control procedures include duplicate samples, spiked blanks, spiked replicates, reagent/instrument blanks, preparation control samples, certified reference material analysis, and instrument control samples.

Duplicate pulp assay results taken by SGS as part of its in-house quality assurance/quality control (QA/QC) program were collected for the BIM drill program and were reviewed by Wahl and Gharapetian (2009 and 2011). Results of the SGS duplicate pulp testwork for all major grade and deleterious grade attributes were evaluated for each year. No contamination issues were noted with blanks. SGS's internal standard results were within two standard deviations of the population mean with no anomalous values. Regressions of duplicates indicated good correlation coefficients with the only issues pertaining to those samples assayed near their detection limit which is expected and not an issue of concern.

QUANTILE PLOTS

In order to verify the quality of the WGM assay database, a quantile-quantile plot was generated for the WGM and BIM five metre composited datasets (Wahl and Gharapetian, 2009). The results indicated a reasonable correlation for percentage of iron.

The percentage of sulphur quantile plot indicates that the BIM drill campaign encountered a significant population of higher grade sulphur results. It is possible that the difference is based on localised geological variations, based on where these samples were taken. The WGM drilling was relatively near surface, while the 2004 and 2005 drilling campaigns were deeper and spread along a greater strike length of the deposit. The percentage of sulphur data anomalies may also be the result of laboratory errors or differences in analytical methodologies. The problematic WGM sulphur results reflect the

Strathcona (2003) observation that metallurgical testwork in 1971 highlighted similar sulphur grade uncertainties.

TWINNED DRILL HOLES

Three sets of WGM holes were twinned by BIM in order to further assess the quality of the WGM database (Tables 5-9 to 5-11). In order to extract comparable data from the variable sample length dataset, the assay data which fell within the interpreted iron formation solids was composited into two metre lengths. Grade attributes common to both datasets included Fe%, SiO_2% and S%.

Table 5-9 compares WGM hole S-2 with BIM MR1-05-67 and indicates that there was a significantly high variability in minimum and maximum Fe%, SiO_2%, and S% grades, resulting in a larger discrepancy in average Fe% and SiO_2% grades. These min/max outliers impact the overall mean grade of the iron formation interval.

All twinned intervals show a slightly higher Fe% grade in the BIM holes compared to the WGM holes. As well, SiO_2% and S% mean grades are consistently higher in the WGM drilled intervals. The difference in sulphur content over a 58 m interval for the WGM and BIM holes in Table 5-9 cannot be explained. The apparent high S% bias in the WGM holes is also not consistent with the sulphur quantile plot results. It is not clear whether this is a result of contamination in the WGM drilling, lower core recovery, actual geological features or as a result of sampling or laboratory error.

Table 5-9 Comparison of Twin Drill Holes S-2 and MR1-05-67
Baffinland Iron Mines Corporation – Mary River Project

	WGM S-2			BIM MR1-05-67		
	Fe%	SiO_2%	S%	Fe%	SiO_2%	S%
Average	66.09	1.84	0.04	68.55	0.73	0.03
Minimum	8.44	0.18	0.00	64.31	0.13	0.01
Maximum	70.72	33.03	0.13	70.62	3.46	0.37
25th Percentile	68.40	0.27	0.02	68.18	0.28	0.01
50th Percentile	68.77	0.45	0.03	68.96	0.49	0.02
75th Percentile	69.54	0.81	0.04	69.50	1.01	0.04
Tri Mean	68.90	0.51	0.03	68.88	0.59	0.02

Comprising 29 composites or 58 m of continuous mineralization.

Table 5-10 Comparison of Twin Drill Holes S-5 and MR1-05-63

Baffinland Iron Mines Corporation – Mary River Project

	WGM S-5			BIM MR1-05-63		
	Fe%	SiO_2%	S%	Fe%	SiO_2%	S%
Average	68.09	0.53	0.07	68.62	0.41	0.01
Minimum	64.40	0.30	0.02	66.74	0.21	0.01
Maximum	69.12	1.19	0.11	69.40	1.41	0.02
25th Percentile	67.78	0.40	0.04	68.37	0.27	0.01
50th Percentile	68.63	0.44	0.07	68.74	0.31	0.01
75th Percentile	68.80	0.48	0.08	69.05	0.39	0.01
Tri Mean	68.09	0.53	0.07	68.62	0.41	0.01

Comprising 29 composites or 58 m of continuous mineralization.

Table 5-11 Comparison of Twin Drill Holes S-6 and MR1-05-60
Baffinland Iron Mines Corporation – Mary River Project

	WGM S-6			BIM MR1-05-60		
	Fe%	SiO_2%	S%	Fe%	SiO_2%	S%
Average	67.57	0.97	0.03	68.30	0.80	0.02
Minimum	64.94	0.25	0.01	61.99	0.14	0.01
Maximum	68.90	2.08	0.05	70.29	3.89	0.08
25th Percentile	66.92	0.61	0.02	67.62	0.27	0.01
50th Percentile	67.72	0.64	0.03	69.18	0.32	0.02
75th Percentile	68.31	1.51	0.04	69.58	0.59	0.04
Tri Mean	67.65	0.92	0.03	68.79	0.39	0.02

Comprising 23 composites or 46 m of continuous mineralization.

External BIM Duplicate Samples

Approximately 5% of the 2004, 2005, 2006, 2007, and 2008 assays were sent to the SGA laboratory in Germany for duplicate pulp analysis. Regressions for each element assayed for each year were run to assess for any persistent or incremental laboratory error. All regressions returned good coefficients of correlation. SGS Lakefield, however, indicates a slight and consistent bias toward higher Mn grades over SGA.

Certified Reference Materials

In 2007, BIM contracted SGA of Germany to create six standards representing a range of Fe, SiO_2, Al_2O_3, FeO, P, and S grades. The standards were generated from Mary River metallurgical samples, in order to provide reference material consistent with the Mary River ore types. Standards were inserted at a rate of 1 in 20 within the BIM sample stream. Standard results from the 2007 and 2008 exploration program were analyzed and plotted for various elements. A total of 60 plots were generated to assess for laboratory drift. No significant assay quality issues were identified.

RPA Conclusions

The analyses of the various QA/QC data indicate that the current BIM drill hole assay database is appropriate for resource estimation.

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