

# HORIZONTE MINERALS PLC MANAGEMENT'S DISCUSSION AND ANALYSIS SIX MONTHS ENDED 30 JUNE 2016

#### **Background**

This Management's Discussion and Analysis of the financial position and results of operations is prepared as at [9 August 2016] and should be read in conjunction with the Condensed Consolidated Financial Statements of Horizonte Minerals plc as at 30 June 2016 and which have been prepared in accordance with International Financial Reporting Standards and International Accounting Standards.

Horizonte Minerals plc (the 'Company') is a publicly listed company, the shares of which are listed on the London Stock Exchange on the AIM market ('AIM') and on the Toronto Stock Exchange (the 'TSX'), in both instances under the symbol 'HZM'.

#### **Company Overview**

The Company is actively engaged in the exploration and development of the Araguaia Nickel Project in Brazil, for which in March 2014 it issued a Pre-Feasibility Study ('PFS' or 'Pre-Feasibility Study') prepared in accordance with Canadian National Instrument 43-101 ('NI 43-101').

The Company's principal shareholders are Teck Resources Limited, which holds a 26.1% interest in the issued share capital of the Company, Henderson Global Investors, which holds 15.7%, Mr Richard Griffiths, who holds a 13.8% interest, and Glencore, which holds a 10.3% interest. The principal project of the Company is the wholly-owned Araguaia Nickel Project ('Araguaia Project', 'Araguaia Nickel Project' or 'Araguaia'), located in Pará State in northeastern Brazil.

In August 2012 the Company released a Technical Report prepared in accordance with NI 43-101—'Preliminary Economic Assessment of the Araguaia Nickel Project, Brazil' ('PEA').

In mid-2013, the Company completed a 9,309 metre 3rd Phase infill drilling programme. The aim of this drilling programme was to upgrade the Inferred Resource. Horizonte Minerals also completed in May 2013 a circa 18 month metallurgical test programme, which was designed to evaluate the expected ore performance in Rotary Kiln Electric Furnace ('RKEF') processing. Work was undertaken principally by FLSmidth, Xstrata Process Support and Kingston Process Metallurgy. The results released illustrated that Araguaia's ore was found to be suitable for treatment using RKEF technology.

In March 2014 the Company completed a PFS on Araguaia. The PFS was based upon the RKEF process and included an updated Resource Estimate comprising 71.98 million tonnes grading 1.33% Ni (Indicated) and 25.35 million tonnes at 1.21% Ni (Inferred) and considered two production scenarios: a 900 thousand tonnes per annum ('Ktpa') single line Base Case ('Base Case') and a 2.7 million tonnes per annum ('Mtpa') Option ('Option'). The Base Case is the Company's preferred route to ferronickel production.

In April 2015 the Company completed a 10,255 metre 4<sup>th</sup> Phase infill resource drilling programme at Araguaia, designed to convert an initial 7-8 years of the proposed 25 year mine life to the Measured Resource category. A geotechnical and hydrogeological drilling programme across the proposed process plant site was also completed.

In September 2015 the Company announced that it had reached an agreement ('Glencore Transaction') to indirectly acquire through wholly owned subsidiaries in Brazil the Glencore Araguaia nickel project ('GAP') in northeastern Brazil from Glencore Canada Corporation ('Glencore'). The Company concurrently announced a placing ('Private Placement') of new ordinary shares to raise £1.55 million through existing shareholders.

In November 2015 the Company announced that it had completed an integrated RKEF pilot plant campaign using a 160 wet tonne, representative ore sample from Araguaia and which produced ferronickel on a continuous and sustained basis to commercial specification.

In November 2015 the Company also announced that following an Extraordinary Meeting of shareholders that it had issued 23,777,773 new shares in the Company to a subsidiary of Glencore as consideration for certain of the licences comprising GAP.

In February 2016 the Company announced the award of four new concession areas adjacent to the Araguaia Project.

#### **Highlights for the Second Quarter of 2016**

 On 8 June 2016 the Company announced that Araguaia Niquel Mineração Ltda, a whollyowned subsidiary, had been awarded a Preliminary Environmental Licence ('LP') for the mining and beneficiation plant to produce ferronickel.

# Events after the Reporting Date

- On 26 July 2016 the Company announced that it had been awarded three new licence areas adjacent to GAP
- On 3 August 2016 the Company announced the transfer to a wholly-owned subsidiary of the Company of the remaining two licences that make up GAP

In the short to medium term the Company's objectives are to

- Complete the acquisition and integration of GAP and Araguaia. GAP is located in the vicinity of the Araguaia Project. The integration of GAP will therefore include an updated Resource Estimate that combines Araguaia and GAP (together the 'Enlarged Project').
- To carry out an updated Pre-Feasibility Study in regard to the Enlarged Project.
- To advance the Enlarged Project towards the Feasibility Study phase, including engineering, geotechnical, water management, logistics and infrastructure studies.
- Following receipt of the LP, to continue to advance the permitting status of the Enlarged Project through on-going environmental and social evaluations directed towards receipt in due course of the Installation Licence ('LI').

#### **Review of Operations**

#### **Araguaia Project**

The Company owns 100% of the Araguaia Project located in southern Parà State, to the south of the Carajás mineral district of northern Brazil; the Company believes that Araguaia has the potential to deliver a resource with size and grades comparable to other nickel laterite projects and mining operations in northern Brazil. Several nickel laterite deposits occur within this region of Brazil, including GAP, which is also located within the Araguaia Fold Belt around 80km to the north of the Araguaia project area.

In March 2011 the Company announced a NI 43-101 compliant maiden Inferred Resource of 76.6 million tonnes with a grading of 1.35% nickel and 0.06% cobalt at Araguaia. In September 2011 the Company completed a 13,200 metre drilling programme.

In January 2012 the Company announced a resource update at Araguaia, comprising an Indicated Mineral Resource of 39.3 million tonnes grading 1.39% nickel together with an Inferred Mineral Resource of 60.9 million tonnes grading 1.22% nickel, both at a 0.95% nickel cut-off.

In August 2012 the Company released the results of a PEA and in March 2014 released the results of a Pre-Feasibility Study on the Araguaia project, both of which were prepared in accordance with NI 43-101.

The Araguaia and GAP Project areas comprise 21 exploration licences (including GAP), totalling 127,328 ha and the landholdings which comprise the Araguaia and GAP Projects do not form part of any native reserves.

#### **Preferred Processing Route**

RKEF is the preferred processing route favoured due to availability of hydro electrical energy in the Araguaia region, combined with the applicability to Araguaia Mineralisation supported by the presence of three operating RKEF pyrometallurgical nickel operations in Brazil.

#### **Recent and Current Activity at Araguaia**

#### **Exploration Activity**

Recent exploration at the site, conducted since 2006 by both the Company and prior owners, has included a total to date of 45,425 metres of diamond drilling including the  $4^{th}$  phase in-fill drill programme completed in April 2015. This  $4^{th}$  phase programme was designed to complete infill drilling on 50 m x 50 m grids on the Pequizeiro and Jacutinga deposits of the Araguaia Nickel Project. The results of this programme will be used in due course to update the current Mineral Resource Estimate which formed part of the PFS released in March 2014 and which comprises 71.98Mt grading 1.33% Ni (Indicated) and 25.35Mt at 1.21% Ni (Inferred).

# **Metallurgical Testwork**

The metallurgical test programme was carried out to determine the suitability of the RKEF process to treat Araguaia ore and develop preliminary process data. The programme was completed during the first half of 2013 and additionally provided process information for the PFS work. A pilot plant testing programme was furthermore completed in November 2015 (see 'Pilot Plant Testing Programme').

The metallurgical test programme included:

- A series of laboratory tests designed to establish the suitability of the ore for rotary kiln processing by FLSmidth at their Bethlehem, PA, USA laboratories;
- Work on agglomeration by Feeco International Inc. of Green Bay, WI, USA, supplemented by briquette testing at K.P. Komarek of Wood Dale, IL, USA; and
- Smelting testing was undertaken at the laboratories of Xstrata Process Support in Sudbury, Ontario, Canada supplemented by additional work on the characteristics of the slag produced by smelting Araguaia laterite and slag melting temperature tests at Kingston Process Metallurgy of Kingston, Ontario, Canada.
- Testing for rotary kiln operation and smelting conditions included the full range of physical and chemical laboratory tests intended to understand the characteristics of Araguaia ore under RKEF conditions.

# Testing for rotary kiln operation

The testwork at FLSmidth was completed on two blends of laterite: one a blend of limonite, transition and saprolite ore and a second blend of transition and saprolite only. The blends were made up in the same proportions as the laterite types as they occur in the in-situ mineral resource. A total of approximately 6,000 kg of laterite material was sent to FLSmidth. The test work showed the following:

- That Araguaia ore is suited for rotary kiln processing in an RKEF plant and the range of operating conditions was identified. This included information on agglomeration features for the dryer design, calcine temperatures and pre-reduction levels to be considered applicable for electric furnace design.
- The tests also showed that Araguaia ore is characterised by a fine natural particle size. Further, the fine particles demonstrated binding properties similar to clays when dried, thereby yielding relatively hard agglomerates resistant to significant degradation and dusting. The end result is that with the tendency for the formation of agglomerates, the dusting potential was considered reasonable and comparable to that of a number of other laterite ores currently processed in commercial RKEF operations. The test work further showed that kiln operations should be conducted so as to allow for a calcine temperature of 800–825°C during rotary kiln processing (versus a range of 850–900°C in a number of other commercial operations). The work also showed that 10% Ni and 60% Fe were reasonable pre-reduction targets for design.

Supporting rotary drum agglomeration testing at Feeco International, with subsequent testing of the product at FLSmidth, demonstrated the production of agglomerates resistant to fines generation during the tumbling action. The result of these studies indicated that, provided the dryer design incorporated lifter features to promote ore agglomeration and particle strength (as included in some commercial dryers), the production of fines and dust would correspond to that in typical current laterite RKEF operations. It is noted that briquetting was also found to produce a satisfactory agglomerated feed, however due to the successful work at Feeco, briquetting was considered not necessary in the process design.

Laboratory smelting tests carried out at the laboratories of Xstrata Process Support in Sudbury, Ontario, Canada showed that smelting Araguaia ores can produce ferronickel alloy over a range of Fe-Ni compositions – from about 15% Ni to over 40% Ni – and a low nickel slag. The testwork was carried out on a blend of limonite, transition and saprolite and a transition/saprolite blend with equally acceptable results. Hatch of Toronto, Ontario, Canada reviewed this work plus the results of the FLSmidth study (and also the slag compositional data) and confirmed that the Araguaia ore is amenable to processing in an RKEF plant under the conditions indicated. Araguaia ores have a high SiO<sub>2</sub>/MgO ratio, in a similar range as that reported during the early years of operation at the BHP-Billiton Cerro Matoso ferronickel operation. Kingston Process Metallurgy of Kingston, Ontario, Canada, examined the characteristics of the slag produced by smelting Araguaia laterite ore. This work both mapped a range of slag compositions using the FACT thermodynamic database, and also experimentally measured the slag melting point using the TGA/DTA technique. Measured slag melting points were in the range of 1,400°C, depending on the specific SiO<sub>2</sub>/MgO ratio and the level of Al<sub>2</sub>O<sub>3</sub> in the slag. These results confirmed the electric furnace smelting conditions when producing a 20% Ni grade of ferronickel, and further confirmed the suitability of the RKEF process for the Araguaia ore. A market study undertaken for Horizonte by CRU Strategies has also confirmed the potential market of this grade of ferronickel to meet the requirements of stainless steel plants.

# Pilot Plant Testing Programme

In the first quarter of 2015 the Company commenced an integrated pilot plant testing programme ('Campaign') at the Morro Azul RKEF pilot plant testwork facility in Minas Gerais, Brazil ('Pilot Plant'). The circa 160 tonne (wet) bulk sample of Araguaia ore was intended to be representative of the PFS

Base Case feed for the first nine years of operation, containing a blend of approximately 60% saprolite and 40% transition material.

The key objectives of the Campaign were to confirm the smelting behaviour of the Araguaia ore, the mode of operation of the dryer/agglomerator-kiln-electric furnace, as well as the production of ferronickel and slag at the temperatures and quality under conditions similar to a commercial operation.

In March 2015 the Company announced that it had successfully completed commissioning of the 'Dryer/Agglomerator' module as part of first stage testing, ahead of the full Pilot Plant launch. This commissioning included the following:

- Ore Preparation. A 20 tonne (wet) bulk sub-sample of Araguaia ore for Drying/Agglomeration pre-testing was delivered to the Pilot Plant in January 2015. Crushing to <30mm and homogenization was carried out on this bulk sample prior to testing.
- Drying/Agglomeration. Drying and agglomeration testing was carried out over a range of test
  conditions in the 1 m diameter by 14 m long LPG-fired dryer. At steady state conditions, the
  required drying and agglomeration performance was achieved over the range of three test
  conditions, with correctly agglomerated material being obtained while meeting the target
  moisture level in the dryer product (18% H<sub>2</sub>O).
- *Kiln Pre-testing.* Kiln pre-commissioning and testing was completed on the diesel fired long kiln (1.3 m diameter by 9.4 m). The dryer product from each of the three dryer runs was mixed with coal and processed in the kiln. The kiln temperature was allowed to slowly increase so that calcine discharge temperature increased from approximately 900 to 1,000 degrees Celsius. Observations of the movement of the calcine material inside the kiln showed that over the above temperature range the feed showed no evidence of sticking or sintering. The calcine product had the required granulometry and averaged reduction (Fe<sup>2+</sup> /Fe<sub>t</sub>) = 54% and the calcine contained an average of 1.8% carbon.

The Company announced the completion of the Campaign in November 2015 and which resulted in production of commercial grade ferronickel from the representative Araguaia ore. Calcine of the required quality was continuously produced in the rotary kiln with dust generation within anticipated limits and favourable pre-reduction levels of circa 60% for iron oxide and 10% nickel oxide reduction.

Subsequent electric furnace smelting of the calcine produced ferronickel over a target range of commercial nickel grades and at a nickel recovery over 93%; both ingot casting and nickel granulation of the product was demonstrated.

Slag was tapped and granulated for later storage. After toxicity characteristic leaching procedure analysis (TCP), the slag was classified as Solid Waste Class IIB, Non-hazardous and Inert in accordance with the Brazilian solid waste classification.

No critical flaws were identified in the process flow sheet and the technical data generated by the Campaign will be incorporated in due course into the planned Feasibility Study.

# Geotechnical Drilling

In the first and second quarters of 2015 the Company also undertook a geotechnical and hydrogeological drilling programme across the proposed process plant site, which will provide information on ground conditions to assist in the design of the process plant structures.

#### **Environmental and Social Baseline Studies and Permitting**

The baseline data collection programme, designed to meet IFC standards, that commenced in November 2011 was completed in 2013, with the exception of the archaeological investigation, which was completed and approved in 2014. The environmental baseline programme included information on: climate, particulate matter, groundwater composition and depth, soils, surface water composition and flow, spring locations, fauna and flora.

The social baseline data collection programme included information on: regional demographics, stakeholders, livelihoods, community infrastructure, cultural heritage, natural resource use, labour and working conditions, vulnerable groups, land rights, regional medical and emergency services, public safety/security, resettlement and traffic volume.

The baseline studies included independent research and investigations undertaken by various groups or individuals:

- Environmental technical investigations for baseline studies and the Social and Environmental Impact Assessment WALM Engenharia e Tecnologia Ambiental.
- Biodiversity (flora and fauna) surveys DBO Engenharia Ambiental.
- Social and community surveys and data analysis resulting in a document on stakeholder mapping, scenario assessment, risk analysis, and communication programme – Integratio Mediação Social e Sustentabilidade (Integratio).

The results of these studies were incorporated into the PFS and will influence the Group's day-to-day social and environmental activities.

The SEIA was finalised and the report submitted to the Brazilian State licensing authority ('SEMA') in June 2014 for the Araguaia Project's LP evaluation.

On 30 January 2015 a public hearing ('Hearing') was held in Conceiçao do Araguaia, the municipality where the Araguaia Project is located. The primary aim of the Hearing was to inform, clarify and encourage further community participation in project planning and it was attended by over 1,000 people including representatives of the local and State authorities. The outcome was positive. The Hearing is a part of the environmental licence process and necessary for the awarding of the LP.

In September 2015, the Brazilian State licensing authority (SEMA) technical team visited the Araguaia Project to assess the social and environmental impact assessment.

In 2015, the Company implemented new policies to ensure that it adheres to best-practice standards, such as IFC Performance Standards, Equator Voluntary Principles on Security & Human Rights, and Brazilian CONAMA regulations. New/enhanced policies implemented throughout 2015 include:

- Business Integrity;
- Complaints Handling Procedures;
- Community Engagement Framework;
- Resettlement Planning; and
- Environmental Monitoring and Management Procedures.

All environmental monitoring procedures were reviewed in 2015 by Brandt Meio Ambiente.

In late 2015, the Company commenced integration of GAP into environmental and social baseline studies.

In June 2016 the Company announced that its wholly-owned subsidiary Araguaia Niquel Minerção Ltda had been awarded the LP for the mining and beneficiation plant to produce ferronickel at Araguaia. The LP was approved with consideration of the terms set out in the Company's Social & Environmental Impact Assessment, and conditions outlined by the Pará State Environmental Agency. This follows the unanimous approval of the licence in a meeting held in the Pará capital of Belém on 23 May 2016, by the Pará State Committee of Environment ('COEMA'), which consisted of State Government ministers, NGOs and representatives from civil society groups<

The Brazilian mine permitting process with environmental agencies has three key stages:

- 1. The recently obtained LP;
- 2. The installation licence ('LI'), which permits the start of construction;
- 3. The licence to operate once construction is complete ('LO').

The Company will now focus on obtaining the LI which once awarded, in parallel with the mining concession, allows construction to start. The LI will require further detailed environmental studies, a Definitive Feasibility Study, and further community engagement. The Company will also work in partnership with the State Government of Pará to undertake studies identifying possibilities for use of the slag product from Araguaia and potential local industries which could benefit from the final ferronickel product.

#### Spend to-date

Direct costs of the Araguaia Project since August 2010 have amounted to approximately £17.3 million up to end-June 2016.

# Pre-Feasibility Study

	Base Case*	Option Case
	900Kpta	2.7Mtpa
	Single line	Twin line
NPV <sub>8</sub> post tax	US\$519 million	US\$1,204 million
IRR post tax	20%	21%
Nickel price	US\$19,000 /t	US\$19,000 /t
Initial mine life	25 years	22 years
Capital Costs – pre-production	US\$582 million	US\$1,436 million
C1 costs	US\$4.16/lb	US\$4.24/lb
	(US\$9,166/t)	(US\$9,380/t)
Free cash flow over LOM (after capital payback)	US\$1,766 million	US\$3,470 million
Pay back period (after taxation)	4.4 years	3.9 years
Breakeven Ni price on NPV <sub>8</sub> post tax	US\$13,977/t	US\$14,060/t
Targeted Production per annum	15,000 tpa Ni	40,000 tpa Ni
Average Ni grade – Year 1 to 10	1.76% Ni	1.57% Ni
Product grade quality	20% Fe-Ni	20% Fe-Ni

<sup>\*</sup>Base Case 900 Ktpa operation is Horizonte's preferred route to ferronickel production.

Dated 25 March 2014, the PFS is a compliant Technical Report ('the Report') which has been prepared for the Company in accordance with NI 43-101 and under the supervision of Qualified Persons within the meaning of National Instrument 43-101 Standards of Disclosure for Mineral Projects. This report

was prepared by Snowden Mining Industry Consultants Limited ('Snowden'), with the following groups involved in the preparation of contributory material: IGEO Mineração Inteligente Ltda (IGEO), KH Morgan and Associates (KHM) and Prime Resources (Pty) Ltd (Prime). The Report summarises the geological, hydrological and engineering studies performed at a PFS level (± 25% accuracy) and used in the economic evaluation of the Project with the objective of proving the economic viability of Araguaia to produce ferronickel ('Fe-Ni'). The Report is published on SEDAR (www.sedar.com) and is available to download from the Company's website (www.horizonteminerals.com).

The engineering design solutions offered in the Report are considered proven industry standard approaches. The mining of nickel laterites is typically open pit with well-established mining practices and earthmoving machine applications. This study considers the open pit configuration for the exploitation of nickel laterites to establish the production of run of mine ('ROM') ore from seven open pits which supply a targeted 900 Ktpa of ore to a processing and smelter facility that uses the RKEF process with the product being sold at the mine gate (Base Case).

Two production scenarios were considered:

- 900 Ktpa
- 2.7 Mtpa

The Base Case of 900 Ktpa has been selected by Horizonte as the preferred route to production based upon its internal criteria to minimise the overall capital intensity as well as technical and execution risk.

The opportunity exists to increase production subject to additional engineering. The Base Case for this study assumes an ore processing rate of 900 Ktpa. A plant construction period of two years has been assumed and the pre-production capital construction costs for the plant are incurred 30% in Year 1 and 70% in Year 2. In addition, sustaining capital has been provided for over the 25 year life of mine and process plant. To minimise capital intensity, the Base Case and Option also assume contractor mining which includes ore haulage to the plant. Supply chain factors have also been considered for inbound and out-bound logistics for key consumables such as coal for smelter requirements.

#### **Location and Infrastructure**

The Araguaia nickel project is located on the south-eastern border of Pará State with Tocantins State, approximately 40 km north of Conceição do Araguaia (population circa 46,000), south of the main Carajas Mining District. The project has access to regional infrastructure including a network of Federal highways and roads, as well as access to hydro-electric power. The port city of São Luís provides the primary supply chain facility for in-bound and out-bound logistics for bulk material handling of coal and potentially Fe-Ni product.

The project can be reached by air from São Paulo via Palmas, the capital of Tocantins State situated to the east of Rio Araguaia. Local flights are supported by airports at Palmas (Tocantins State), and Redenção via Belém/Marabá. From Palmas it is a further 400 km drive on sealed highways to the main Araguaia field office in Conceição de Araguaia.

#### **Mineral Resources**

Mineral Resources for the Araguaia Nickel Project, as at March 2014, by material type (0.95% Ni cutoff grade) are:

Araguaia	Category	Material type	Tonnage (kT)	Density (t/m3)	Contained Ni metal (t)	Ni (%)	Co (%)	Fe (%)	
Sub-	Indicated	Limonite	11,560	1.35	137,790	1.19	0.127	36.50	
total	marcatea	Limonice	11,500	1.55	137,730	1.13	0.127	30.30	
Sub-	Indicated	Transition	24,110	1.19	346,920	1.44	0.060	19.87	
total	maicated	Transition	24,110	1.19	340,920	1.44	0.000	19.67	
Sub-	Indicated	Saprolite	36,310	1.32	473,960	1.31	0.034	11.82	
total	Indicated	Sapronte	30,310	1.52	473,900	1.51	0.034	11.82	
Sub-	Inferred	Limonite	0 020	1.34	100,310	1.14	0.097	3E 0E	
total	illierreu	Limonite	8,830	1.54	100,510	1.14	0.097	35.85	
Sub-	Inferred	Transition	9,340	1.28	122,040	1.31	0.053	20.34	
total	illierreu	Transition	9,340	1.20	122,040	1.51	0.055	20.54	
Sub-	Inferred	Saprolite	7,190	1.41	04 270	1.18	0.033	12.07	
total	illielleu	Sapronte	7,130	1.41	84,370	1.10	0.055	12.07	
TOTAL	Indicated	All	71,980	1.28	958,660	1.33	0.058	18.48	
TOTAL	Inferred	All	25,350	1.34	306,730	1.21	0.063	23.40	

- 1. Totals may not add due to rounding. Mineral Resources are inclusive of Mineral Reserves.
- 2. The resource classification scheme adopted by Snowden was based on the following:
  - Mineralisation was classified as Indicated where the drilling density was 100 mE by 100 mN (or less).
  - Mineralisation delineated using a drilling density larger than 100 mE by 100 mN and up to about 150 m spacing was classified as Inferred.
  - Mineralisation delineated using sparse spacings was not classified.
- 3. Mineral Resources reported for the PFS deposits were prepared under the supervision of Qualified Person Mr. Andrew F. Ross an employee of Snowden.
- 4. Mineral Resources (Inferred) for the other deposits in the project (not considered for the PFS) were prepared by Dr. Marc-Antoine Audet and were reported in Audet, M A, et all (2012).
- 5. The Indicated Mineral Resources are inclusive of those Mineral Resources modified to produce Mineral Reserves.

35,200m of core drilling (HQ) (1,412 holes) had been completed on the Araguaia Project (Phase 1 to 3 resource drilling programmes) as at the date of publication of the above Mineral Resource. A further 10,225 metre Phase 4 resource infill drilling programme was subsequently completed in April 2015, the results of which will feed into future Resource and Reserve estimates.

It should be noted that the Mineral Resource statement above does not include estimates for other prospects within the Project area (Morro, Southern, Oito West and Pequizeiro East) due to insufficient drill information at this stage. The Mineral Resource statement also excludes the historical estimate with respect to GAP.

The Project's Resource inventory is sufficient to support larger scale mining operations than those underpinning the Base Case 900 Ktpa, up to the 2.7Mtpa Option.

#### Mineral Reserves

The estimation of Mineral Reserves used estimates of Indicated Mineral Resources for the Project. A Mineral Reserve estimate of 21.2Mt (dry) at an average grade of 1.66% Ni was estimated. The detailed breakdown of the Mineral Reserve by deposit is presented below. This Mineral Reserve is calculated for the Base Case only.

Mineral Reserve for the Araguaia Nickel Project, Snowden as at March 2014

Class	Deposit	Ore Dry Mass (kt)	Ni (%)	Fe (%)	Al <sub>2</sub> O <sub>3</sub> (%)	SiO₂/MgO
Probable	Baião	3,500	1.67	17.41	4.58	2.56
Probable	Pequizeiro	9,300	1.70	15.58	5.39	2.56
Probable	Pequizeiro West	380	1.57	20.38	4.63	4.29
Probable	Jacutinga	960	1.81	15.13	2.96	2.11
Probable	Vila Oito East	2,450	1.55	15.97	3.73	2.22
Probable	Vila Oito	3,580	1.63	14.61	3.63	2.05
Probable	Vila Oito West	1,020	1.59	19.35	4.25	3.32
Total Proba	ble	21,200	1.66	16.01	4.59	2.44
Proven	Proven		N/A	N/A	N/A	N/A
Total Proba	able	21,200	1.66	16.01	4.59	2.44

- 1. The Mineral Reserves are included in the reported Indicated Mineral Resources.
- 2. The Minerals reserves were developed using a value of refined Nickel of US\$15,000/t a mining cost of US\$3/t for ore and US\$9/t for waste, a processing cost of US\$127.8 /t of feed and a G&A costs of US\$11.20/t of feed. Additionally, specific constraints with respect to the grade and ratio of certain compounds that the process technology could tolerate were applied. Pit slopes were limited to a maximum overall slope angle of 35 degrees.
- 3. Totals may not add due to rounding.

#### Mining

Araguaia is expected to utilise open pit mining methods across seven pits with Base Case production scheduled to mine on average 3.3 Mtpa in order to deliver 900 Ktpa of ore to the plant for 25 years. All seven pits were designed through a standard process of pit optimisation, waste dump design and pit design. The pit design used smoothed pit shells from the pit optimisation and altered for the removal of small satellite pits. The Project was scheduled on the basis of panels. A total of 43 panels for the project were designed and scheduled. Within each panel, a number of 'bins' are generated on the basis of rock type and nickel grade. The production schedule was completed in quarterly increments over the life of the project.

A number of processing constraints were applied to the schedule which included a 13 month processing feed quantity ramp up period, and specific process feed grade constraints throughout the life of the project:

- Fe grade between 15.0% and 16.5%
- Al<sub>2</sub>O<sub>3</sub> content between 4.0% and 5.5%
- SiO<sub>2</sub>/MgO ratio between 2.2 and 2.6

Each of the deposits is proposed to be mined with truck and excavator mining. Although the primary fleet requirement changes throughout the life of the project, a typical configuration is  $6 \times 48 \text{ t}$  operating weight ('OW') excavators,  $3 \times 50 \text{ t}$  OW front end loaders,  $17 \times 40 \text{ t}$  rated payload ('RP') articulated off-highway trucks and  $2 \times 30 \text{ t}$  RP on-highway trucks for longer inter-pit haulage. This fleet is supported by the usual array of support and ancillary equipment.

#### **Processing**

The Project is expected to produce ferronickel via the pyrometallurgical process of Rotary Kiln Electric Furnace technology. This is a circa 60 year old technology with circa 20 plants operating worldwide today. The Base Case assumes a single line RKEF installation for 900ktpa (dry) ore, producing

approximately 15,000tpa nickel as Fe-Ni. The overall process flow block diagram can be accessed on the Company's website under the 'Araguaia Project' tab.

The initial process stages encompass ore preparation, where the ore is sized to match the subsequent metallurgical process requirements. Kiln dust is recycled to the process before the secondary crushing stage in a roll crusher with an 80mm gap. The ore is then homogenised, partially dried and fed to the kiln with the addition of metallurgical coal. In the kiln, the ore is completely dried and calcined to remove chemically combined moisture, and partially pre-reduced. Calcined material is transferred into a single 50 MW electric furnace for the separation of the metal and slag at high temperatures. The metal is conveyed in ladles to the refining stage. The refined oxidised slag is granulated with water, while the reduced slag is transported molten and disposed of in a specific site. The final Fe-Ni product is granulated with water, screened, dried and stockpiled prior to dispatch to the market. The average nickel grade over the life of project is estimated at 20% nickel in Fe-Ni. The Base Case is for a 25 year Life of Mine with ore processing capacity of 900 ktpa and 674 ktpa slag production respectively.

### **Base Case Capital Cost Estimates**

Item	US\$ million
Plant direct	376
Plant indirect	38
Owners costs	18
Infrastructure	56
Slag storage facility	5
Social	6
Mining	5
Contingency at 15%	77
First fills and spares	1
Total pre-production capital costs	582

The capital cost estimates have been complied with an accuracy level of  $\pm 25\%$ .

#### **Operating Cost Estimates**

Item	US\$ million	US\$/tonne - ore
Mining (contractor)	553	26
Processing	2,642	125
Off-site overheads	99	5
Total operating costs	3,294	155.32

**Economic Analysis and Sensitivities** 

Base Case economic model headline results before taxation

Item	Unit	Value
Net Cashflow	US\$ million	2,433.9
NPV <sub>8</sub>	US\$ million	730.1
IRR	%	22
Production payback period	years	4.1

# Base Case economic model headline results after taxation

Item	Unit	Value
Net Cashflow	US\$ million	1,765.9
NPV <sub>8</sub>	US\$ million	519.2
IRR	%	20
Production year payback	years	4.4

# Base Case economic model inputs

Item	Unit	Value
Pre-Production period	years	2.0
Life of project production	years	24.75
LOM ore mined and processed	millions of tonnes	21.206
LOM waste mined	millions of tonnes	60.050
LOM Average Ni grade	%	1.66
LOM Average Fe grade	%	16.01
LOM Average Ni recovery	%	93.0
LOM Average Fe recovery	%	37.9
LOM Average product Ni grade	%	20.3
LOM Average product Fe grade	%	79.7
Plant throughput	million tonnes per annum	0.9
LOM Ni Price	US\$/tonne	19,000
LOM Fe Price	US\$/tonne	150

The LOM Ni price of US\$19,000 per tonne was adopted following a review of multiple information sources including a report produced by Consensus Economics Inc. in December 2013 and based on forward price estimations from 19 analyst and banking groups, together with analysis of average nickel prices over the past 10 years combined with industry benchmarking.

# Pre Tax Sensitivity table for NPV<sub>8</sub>

The sensitivity analysis determines how the  $NPV_8$  is affected with changes to one variable at a time while holding the other variables constant. The pre tax results of the Base Case sensitivity analysis are presented the table below:

US\$ million	-20%	-10%	-5%	0%	5%	10%	20%
Grade Ni	231	480	605	730	855	980	1229
Grade Fe	715	723	726	730	734	738	745
Mining reserves	678	723	728	730	750	773	813
Recovery Ni	231	480	605	730	855	918	918
Recovery Fe	715	723	726	730	734	738	745
Price Ni	231	480	605	730	855	980	1229
Price Fe	715	723	726	730	734	738	745
Pre- production capital	836	783	757	730	704	677	624
Production capital	734	732	731	730	729	728	726
Mining cost	774	752	741	730	719	708	686
Processing cost	922	826	778	730	682	634	538
Overhead cost	750	740	735	730	725	720	710

#### **Glencore Transaction**

On 28 September 2015 the Company announced that it had reached agreement to indirectly acquire the GAP through wholly owned subsidiaries in Brazil.

#### **GAP Details**

The geological setting of GAP is similar to Araguaia. They are both located in Neo-Proterozoic Araguaia Fold Belt, a 1,000km long and 150km wide orogenic zone between the Amazon Craton to the west and the San Francisco Craton to the east. The nickel laterite deposits in both Araguaia and GAP are developed on peridotites that form part of mafic-ultramafic complexes representing tectonic remnants of ophiolites emplaced in metasediments that form the western, external zone, of the Araguaia Belt.

The current GAP licences contain three nickel laterite deposits, Serra do Tapa and Pau Preto (together: 'SdT'), and Vale dos Sonhos ('VdS'). Exploration work in the original concessions was started by Falconbridge (later Xstrata Nickel) in 2003. By 2008 this work included the completion of over 2,500 diamond drill holes as part of a resource programme. Drilling on the SdT and VdS deposits was completed on 80m x 80m grids and on a 160m x 160m grid on the PP deposit. Small areas of closer spaced drilling were completed to evaluate short-scale variability.

The historical estimate for GAP at a 0.90% nickel cut-off is presented in the following table. This estimate was prepared in accordance with the CIM Definition Standards on Mineral Resources and

Mineral Reserves as published in the GlencoreXstrata Resources & Reserves Report 31 December 2013. The mineral resource estimation for GAP ('historical estimate') is historic in nature. The key assumptions used to prepare the historical estimate are outlined below. The historical estimate for the SdT and VdS deposits used Ordinary Kriging into 40m x 40m x 2m blocks with Change of Support to 5m x 5m 2m blocks, utilising data from 1,302 diamond drill holes comprising 55,334 metres. The resource estimation for PP was derived by estimation into a 3D model using the nearest neighbour technique, utilising data from 177 diamond drill holes comprising 4,838 metres. Further analysis required on the historical estimate principally includes recalculation using the input parameters used to calculate the mineral resource estimate for Araguaia. A qualified person has not done sufficient work on behalf of the Company to classify the historical estimate as current mineral resources or mineral reserves and the Company is not treating the historical estimate as current mineral resources or mineral reserves. A review by the Company has indicated that the data preparation has been undertaken according to industry best practices and that the historical estimate has provided an appropriate basis for analysis conducted to date.

Deposits	Ni cut- off grade	Measured Mineral Resources		Indicated Mineral Resources		Measured & Indicated Resources		Inferred Mineral Resources	
		Mt	% Ni	Mt	% Ni	Mt	% Ni	Mt	% Ni
GAP historical estimate *	0.90	16.1	1.44	89.0	1.31	105.1	1.33	18	1.3

Mt = millions of tonnes

#### NI 43-101 Technical Report on the Vale dos Sonhos Project

A Technical Report ('VdS Report') has been prepared for the Company in accordance with NI 43-101 and under the supervision of Qualified Persons within the meaning of National Instrument 43-101 Standards of Disclosure for Mineral Projects. With effective date of 28 September 2015, the VdS Report summarises the location, history, property ownership, geology and exploration and drilling activities carried out at VdS, together with mineral processing and metallurgical testwork. There are no Mineral Resources published in relation to the project in the VdS Report, which is published on SEDAR (<a href="https://www.sedar.com">www.sedar.com</a>).

VdS is one of the three licences comprising GAP and is located some 70 kilometres northeast of Xinguara, in Parà State, Brazil. Between 2004 and 2007 a drilling programme was carried out at VdS, with a total of 839 holes were completed for 28,863 metres up to August 2007. No drilling has been undertaken since at VdS.

The VdS licence covers 3,180 ha, topography is mildly undulating. The geological setting is similar to that at Araguaia, comprising lateritic mineralisation with supergene concentration of nickel.

Metallurgical testwork has been carried out to determine the mineral characteristics, including QEMSCAN (Quantitative Evaluation of Minerals by Scanning Electron Microscope), EPMA (Electron Probe Micro Analyser) and XRD (X-Ray Powder Diffraction).

The VdS report recommends a re-evaluation of the historic mineral resource estimate incorporating the parameters applied to the Company's Araguaia Project and working towards evaluation of the potential synergies between VdS and Araguaia. The next step for the Vale dos Sonhos project would be further engineering and geoscientific evaluation, as well as updating the mining and economic studies.

<sup>\*</sup> Source: GlencoreXstrata - Resources & Reserves Report 31 December 2013.

NI 43-101 Technical Report on the Serra do Tapa and Pau Preto Projects

A Technical Report ('SdT Report') which has been prepared for the Company in accordance with NI 43-101 and under the supervision of Qualified Persons within the meaning of National Instrument 43-101 Standards of Disclosure for Mineral Projects. With effective date of 3 August 2016, the SdT Report summarises the location, history, property ownership, geology and exploration and drilling activities carried out at SdT, together with mineral processing and metallurgical testwork. There are no Mineral Resources published in relation to the project in the SdT Report, which is published on SEDAR (www.sedar.com).

SdT comprises the Serra da Tapa and Pau Preto licences – two of the three that make up GAP. It is located some 65 kilometres northeast of Xinguara, in Parà State, Brazil. Between 2004 and 2007 a drilling programme was carried out at SdT, with a total of 952 holes were completed for 48,845 metres at Serra do Tapa and 185 holes for 5,068 metres at Pau Preto. No drilling has been undertaken since at SdT.

The SdT licences cover a total of 14,014 ha, topography is mildly undulating. The geological setting is similar to that at Araguaia, comprising lateritic mineralisation with supergene concentration of nickel.

Metallurgical testwork has been carried out to determine the mineral characteristics, including QEMSCAN (Quantitative Evaluation of Minerals by Scanning Electron Microscope), EPMA (Electron Probe Micro Analyser) and XRD (X-Ray Powder Diffraction).

The SdT report recommends a re-evaluation of the historic mineral resource estimate incorporating the parameters applied to the Company's Araguaia Project and working towards evaluation of the potential synergies between SdT and Araguaia. The next step for the Serra da Tapa and Pau Preto projects would be further engineering and geoscientific evaluation, as well as updating the mining and economic studies.

# **Details of Glencore Transaction**

Pursuant to a conditional asset purchase agreement ('Asset Purchase Agreement') between, amongst others, the Company and Xstrata Brasil Exploração Mineral Ltda ('Xstrata'), a wholly-owned subsidiary of Glencore, the Company agreed to pay a total consideration of US\$8,000,000 to Xstrata, which held the title to GAP. The consideration is to be paid according the following schedule;

- US\$2,000,000 in ordinary shares in the Company (the 'Initial Consideration Shares'), split between the SdT and VdS deposit areas and payable on the relevant closing date for such deposit area. The closing date is linked to the date on which the Company or a subsidiary of the Company is registered as holder of such deposit areas by the National Department of Mineral Production of Brazil ('DNPM'). On 25 November 2015 the Company announced that further to the approval of shareholders at the General Meeting held on that date, and registration of transfer from Glencore to a subsidiary of the Company by the DNPM of the licence pertaining to VdS, that it had issued 23,777,273 Initial Consideration Shares to a Xstrata, equivalent in value to US\$660,000 at an Issue Price ('Issue Price') price of 1.84 pence per Initial Consideration share.
- On 3 August 2016 the Company announced that following the registration by the DNPM of the transfer of the licences pertaining to SdT from Xstrata to a wholly-owned subsidiary of

the Company and pursuant to the Asset Purchase Agreement, the Company had completed the second and final allotment to Xstrata of Initial Consideration Shares.

- Further to the Company's announcement on 3 August 2016, the Company issued and allotted 50,729,922 new Ordinary Shares to Xstrata, being the Initial Consideration Shares equivalent in value to US\$1,340,000. These Initial Consideration Shares were issued at an Issue Price of 1.99 pence per share. This allocation of shares signifies the completion of the issuance of the Initial Consideration Shares to a total value of US\$2,000,000.
- In accordance with the Asset Purchase Agreement, the Company issued the Initial Consideration Shares at an Issue Price per Initial Consideration Share equal to the five day volume weighted average share price on AIM taken on the business day prior to the respective closings and converted at a rate of exchange as set out in the Asset Purchase Agreement.
- US\$1,000,000 after the date of issuance of a feasibility study for the enlarged project, to be satisfied in ordinary shares in the Company ('Second Consideration Shares') at the five day volume weighted average price taken on the tenth business day after the date of such issuance, or cash, at the election of the Company; and
- The remaining consideration will be paid in cash, as at the date of first commercial production from any of the resource areas within Araguaia or GAP project areas.

Following the Private Placement, the Company did not have sufficient share authorities to issue the Initial Consideration Shares or the Second Consideration Shares. Accordingly, on 29 October the Company published a Circular convening a general meeting of its shareholders on 25 November 2015, whereon resolutions resolutions were approved, granting the directors the requisite authorities to issue and allot the Initial Consideration Shares and the Second Consideration Shares.

The SdT deposit area concessions are subject to on-going litigation with a Brazilian third party. Glencore has disputed these claims. The parties have agreed certain protections including the receipt by HZM from Glencore of certain indemnities in respect of such litigation.

The Asset Purchase Agreement contains customary warranties regarding GAP and the parties' ability to enter into the Proposed Transaction and is subject to customary termination rights.

#### **Technical Disclosure**

All scientific and technical information contained in this Management's Discussion and Analysis has been prepared by or under the supervision of David Hall, Chairman of the Company, a "qualified person" within the meaning of NI 43-101. For further details on the Araguaia Project, please refer to "Prefeasibility Study (PFS) for the Araguaia Nickel Project Parà State Brazil NI 43-101 Technical Report, dated 25 March 2014 available on the Company's website at <a href="https://www.horizonteminerals.com">www.horizonteminerals.com</a> and on SEDAR at www.sedar.com.

For further details on the Vale dos Sonhos licence, please refer to "NI 43-101 Technical Report on the Vale dos Sonhos Project", effective date 28 September 2015 and available on SEDAR at <a href="https://www.sedar.com">www.sedar.com</a>.

For further details on the Serra da Tapa and Pau Preto licences, please refer to "NI 43-101 Technical Report on the Serra do Tapa and Pau Preto Projects Projects", effective date 3 August 2016 and available on SEDAR at <a href="https://www.sedar.com">www.sedar.com</a>.

#### **Summary of Financial and Operating Performance**

# **Summary of Cashflows**

>>	6 months ended	30 June	30 June
		2016	2015
		£	£
>>	Net cash flows used in operating activities	(408,820)	(464,284)
>>	Net cash used in investing activities	(749,022)	(1,955,106)
>>	Net cash flow generated from financing activities	-	-
>>	Net increase /(decrease) in cash and cash equivalents	(1,157,842	(2,419,390)

The net cash flows used in operating activities for the six months ended 30 June 2016 and 30 June 2015 are driven by activities in the management of the Araguaia Project together with GAP. These management activities were at a similar level in 2016 as compared to 2015 – the higher negative cashflows from operating activities in 2015 as compared to the same period in 2016 is principally to working capital movements. See 'Results from Operations' for further analysis.

Cash used in investing activities has decreased to £(749,022) in the six months ended 30 June 2016 when compared to £(1,955,106) in the six months ended 30 June 2015. The higher spend in the first half of 2015 as compared to 2016 is driven by the  $4^{th}$  Phase diamond in-fill drilling programme at Araguaia, which commenced in November 2014 and was completed in April 2015.

#### **Quarterly Financial Information**

	30 June 2016 £	31 March 2016 £	31 December 2015 £	30 September 2015 £	June	31 March 2015 £	31 December 2014 £	30 September 2014 £
Revenue	_	_	_	_	_	_	_	_
Profit/(Loss) from continuing operations	(624,074)	(332,100)	(77,183)	(418,188)	(203,146)	(956,035)	(587,816)	(350,066)
Total comprehensive income attributable to owners of the parent		2,956,612	349,973	(4,419,343)	(969,996)	(3,629,912)	(1,626,372)	(1,634,940)
Basic earnings/(loss) pence per share	(0.093)	(0.049)	(0.012)	(0.085)	(0.041)	(0.194)	(0.119)	(0.155)

Profit/(loss) from continuing operations in each of the periods disclosed is driven on an on-going basis by administrative expenses, including exploration costs expensed, together with stock option charges, (loss)/gain on foreign exchange and finance income and costs. Project impairment costs also arose in in the first quarter of 2014. Changes in fair value of contingent consideration arose in each quarter subsequently (see below).

The loss from continuing operations of £(392,092) in the second quarter of 2014 was after a change in fair value of contingent consideration payable to Teck Resources of £95,808. The second quarter of 2014 also saw a loss on foreign exchange of £(22,099).

The loss from continuing operations of £(350,066) in the third quarter of 2014 was after a change in fair value of contingent consideration payable to Teck Resources of £(68,181). The third quarter of 2014 also saw a gain on foreign exchange of £29,396.

The loss from continuing operations of in the fourth quarter of 2014 of £(587,816) was after a change in fair value of contingent consideration payable to Teck Resources of £(41,880). The fourth quarter of 2014 also saw a loss on foreign exchange of £(43,800). The loss from continuing operations in the fourth quarter of 2014 of £(587,816) was also after administrative expenses of £(433,400) – this was higher in the previous quarters due to payment in the quarter of management bonuses of £(85,000), which were awarded in connection with delivery of the Pre-Feasibility study in March of 2014.

The loss from continuing operations in the first quarter of 2015 of £(956,035) was after: a change in fair value of contingent consideration payable to Teck Resources of £(245,375); a one-off non-cash charge of £(253,006) which arose on the transfer out of the available for sale reserve of losses previously incurred in connection with the impairment of an available for sale asset – this was offset by a corresponding credit to Other Comprehensive Income; a charge for administrative expenses of £(214,437) was also incurred – this was at a similar level to that of the same quarter in 2014.

The loss from continuing operations in the second quarter of 2015 of £(203,146) was net of a charge for administrative expenses of £(201,531), a loss on foreign exchange of £(69,478) as the Brazilian Real and Canadian Dollar continued to weaken against Sterling, and a finance charge of £(80,982) in connection with the unwinding of the contingent consideration payable to the former owners of Teck Cominco Brasil S.A., offset by a credit of £190,312 arising from a change in value of contingent consideration. These latter two items are more fully explained in 'Contingent consideration' in the section 'Critical Accounting Policies and Estimates'.

The loss from continuing operations in the third quarter of 2015 of £(418,188) was net of a charge for administrative expenses of £(186,584), a loss on foreign exchange of £(43,798) as the Brazilian Real and Canadian Dollar continued to weaken against Sterling, and a finance charge of £(80,982) in connection with the unwinding of the contingent consideration payable to the former owners of Teck Cominco Brasil S.A., with a further charge of £(56,558) arising from a change in value of contingent consideration. These latter two items are more fully explained in 'Contingent Consideration' in the section 'Critical Accounting Policies and Estimates'.

The loss from continuing operations of in the fourth quarter of 2015 of £(77,183) was after a change in fair value of contingent consideration payable of £250,136 – the estimated date of payment of the contingent consideration was deferred by 24 months, creating a credit to the income statement due to an increase in discounting. The loss from continuing operations in the fourth quarter of 2015 of £(77,183) was also after administrative expenses of £(262,340) – this was broadly in line with previous quarters in the year.

The loss from continuing operations in the first quarter of 2016 of £(332,100) was after administrative expenses of £(184,090), gain in fair value of contingent consideration of £ (99,767), partly offset by gain in foreign exchange of £ 44,311.

The loss from continuing operations in the second quarter of 2016 of £(624,074) was after administrative expenses of £(200,938), and a gain in fair value of contingent consideration of £ (363,534) due to a weakening of Sterling against the United States Dollar, in which the contingent consideration is denominated. This was partly offset by gain in foreign exchange of £ 35,988.

Total comprehensive income attributable to equity holders of the company is driven by results from continuing operations, combined with finance income and costs and exchange differences arising on translating foreign operations.

Exchange differences arising on translating foreign operations arise as the values of the exploration assets of the Company are denominated in the currency of the country in which they are located.

Total comprehensive income attributable to equity holders of the company in the second quarter of 2014 of £(437,787) was after exchange differences arising on translating foreign operations of £(45,919) as the Brazilian Real weakened against Sterling in the quarter.

Total comprehensive income attributable to equity holders of the company in the third quarter of 2014 of £(1,634,940) was after exchange differences arising on translating foreign operations of £(1,284,991) as the Brazilian Real weakened against Sterling in the quarter.

Total comprehensive income attributable to equity holders of the company in the fourth quarter of 2014 of £(1,626,372) was after exchange differences arising on translating foreign operations of £(1,016,477) as the Brazilian Real weakened against Sterling in the quarter.

Total comprehensive income attributable to equity holders of the company in the first quarter of 2015 of £(3,629,912) was after exchange differences arising on translating foreign operations of £(2,926,883) as the Brazilian Real further weakened against Sterling in the quarter.

Total comprehensive income attributable to equity holders of the company in the second quarter of 2015 of £(969,996) was after exchange differences arising on translating foreign operations of £(766,850) as the Brazilian Real further weakened against Sterling in the quarter.

The weakening of the Brazilian Real against Sterling accelerated in the third quarter of 2015, with a £(4,001,155) charge arising on currency translation differences on translating foreign operations contributing to the overall total comprehensive income attributable to equity holders of the company in the quarter of £(4,419,343).

Total comprehensive income attributable to equity holders of the company in the fourth quarter of 2015 of £349,973 was after exchange differences arising on translating foreign operations of £427,156 as the Brazilian Real strengthened against Sterling in the quarter.

The strengthening of the Brazilian Real against Sterling continued in the first quarter of 2016: total comprehensive income attributable to equity holders of the company of £2,956,612 was after exchange differences arising on translating foreign operations of £3,288,712.

In the second quarter of 2016 the strengthening of the Brazilian Real against Sterling continued: total comprehensive income attributable to equity holders of the company of £4,293,720 was after exchange differences arising on translating foreign operations of £4,917,794.

# **Results from Operations**

6 m/e 30 June	6 m/e 30 June	3 m/e 30 June	3 m/e 30 June
2016	2015	2016	2015
£	£	£	£

General and Administration				
Costs				
			,	
Compensation	(131,524)	(145,498)	(63,921)	(64,678)
Travel / Expenses	(36,692)	(37,485)	(21,543)	(21,497)
Exploration Costs Expensed	(86,988)	(86,836)	(45,188)	(48,900)
Toronto Stock Exchange fees and				
associated costs	(12,866)	(13,432)	(1,976)	(8,297)
Professional Fees	(73,114)	(59,092)	(35,218)	(24,996)
Investor Relations	(32,034)	(44,611)	(24,432)	(24,219)
Overheads / Other	( <u>11,810)</u>	( <u>29,014</u> )	( <u>8,660</u> )	(8,944)
Total General and				
Administration Costs	(385,028)	(415,968)	(200,938)	(201,531)
Charge for stock options granted	(18,184)	(86,890)	(9,092)	(44,679)
Change in value of contingent				
consideration	(463,301)	(55,063)	(363,534)	190,312
Other losses – impairment of				
available for sale asset	-	(253,006)	-	-
Gain / (loss) on Foreign Exchange	<u>80,300</u>	(196,620)	<u>35,988</u>	<u>(69,478)</u>
Loss from Operations	(786,213)	(1,007,547)	(537,576)	(125,376)

General and Administration costs have remained at an overall similar level in the six months ended 30 June 2016 at £ (385,028) as compared to the 6 Months ended 30 June 2015, when they amounted to £ (415,968).

Within General and Administration costs:

- Compensation has decreased from £ (145,498) in the 6 months to 30 June 2015 to £(131,524) in the six months ended 30 June 2016. This is due to timings of certain payments and movements in accruals. The actual level of compensation remained unchanged in the two periods.
- Travel costs of £ (36,692) in the six months to 30 June 2016 were at similar levels to the 6 months ended 30 June 2015, when they amounted to £ (37,485).
- Exploration costs expensed amounted to £ (86,988) in the six months ended 30 June 2016 as compared to £ (86,836) in the equivalent period in 2015. In each period they principally comprised salaries of local Brazilian management, which remained at similar levels in the two periods, after allowing for pay increases which are statutory under Brazilian social laws.
- Activities by professional advisors also remained similar across the comparable periods: the
  level of professional fees also remained at a similar level: £ (73,114) in the six months ended
  30 June 2016, as compared to £ (59,092) in the equivalent period in 2015. Professional fees
  include legal fees and fees from technical and specialist advisors as well as corporate advisory,
  accounting, audit and secretarial charges.
- Investor relations charges were reduced to £ (32,034) in the first six months of 2016 as compared to £ (44,611) in the equivalent period in 2015 due to cost reduction initiatives.
- The charge for stock options has fallen from £ (86,890) during the six months ended 30 June 2016 to £ (18,184) during the equivalent period in 2016 due to the charge for options issued in May 2014 having vested after 18 months. These are non-cash charges.

There have also been a number of non-cash cost items which impacted Profit / (Loss) from operations and which arose in the first halves of 2016 and 2015, as follows:

- The change in fair value of contingent consideration in the six months ended 30 June 2015 resulted in a charge to the profit and loss of £55,063 and was due to exchange rate changes in the functional currency in which the contingent consideration liability is payable. The charge in the first six months of 2016 of £ (463,301) was also due to exchange rate changes. See 'Contingent consideration' in 'Critical Accounting Policies and Estimates' for further analysis and explanation.
- The £ (253,006) charge in the three months ended 30 June 2015 in relation to 'other losses impairment of available for sale asset' is a non-cash charge arising with the transfer out of available for sale reserves of losses in connection with a financial asset held by the group. It is offset with a corresponding credit to other comprehensive income in the condensed consolidated statement of comprehensive income for the six months ended 30 June 2015. There was no such charge in 2016.

#### Additional movements:

• The (loss)/gain on foreign exchange is associated with movements arising on cash deposits held by the Company in currencies other than Sterling.

# **Analysis of Intangible Assets**

			Exploration and	
	Goodwill	Exploration licences	evaluation costs	Total
	£	£	£	£
Cost				
At 1 January 2015	270,925	-	20,499,387	20,770,312
Additions	-	-	1,914,996	1,914,996
Impairment	-	-	-	-
Exchange rate movements	<u>(41,303)</u>	Ξ	<u>(3,225,364)</u>	(3,266,667)
Net book amount at 30 June 2015	229,622	-	19,189,019	19,418641
At 1 January 2016	192,028	3,174,275	16,679,799	20,046,102
Additions	-	-	784,588	784,588
Impairment	-	-	-	-
Exchange rate movements	<u>70,174</u>	<u>1,162,895</u>	<u>6,228,380</u>	<u>7,461,449</u>
Net book amount at 30 June 2016	262,202	4,337,170	23,692,767	28,292,139

Exploration and evaluation costs comprise the Araguaia project. Exploration licences comprise the Vale dos Sonhos licence acquired from a subsidiary of Glencore in November 2015.

The accounting policies of the Group specify that intangible assets are to be denominated in the functional currency of the country in which the asset is located. The accounting policies of the Group specify that intangible assets are to be denominated in the functional currency of the country in which the asset is located. The Araguaia / GAP Projects are thus denominated in Brazilian Reais.

# Other Information Outstanding Share Data

		30	30	30	30
		June	June	June	June
		2016	2016	2015	2015
>>		Number	£	Number	£
paid	ed and fully Ordinary es of 1p				
>> At 1	January 67	1,204,378	6,712,044	492,427,105	4,924,271
>> Issu shar	e of ordinary es			-	-
>> At 3	0 June <b>67</b>	1,204,378	6,712,044	492,427,105	4,924,271

## **Stock Options in the Company**

Total options outstanding as at the date of this document amount to 48,760,000 with exercise prices ranging from 4.00 pence to 15.5 pence, and which will be fully vested by 9 December 2016. There is no other share-based compensation paid by the Company.

The Company recognises as an expense the cost of stock based compensation based upon the estimated fair value of new stock options granted. The fair value of each stock option is estimated on the date of grant using the Black-Scholes option pricing model and is expensed over the vesting period.

#### **Liquidity, Capital Reserves and Financing Activities**

The Company is not in commercial production on any of its properties and accordingly it does not generate cash from operations and finances its activities by raising capital through equity issues.

As at 30 June 2016 the Company had £1,660,194 in cash at bank and on deposit. As at 30 June 2015 cash at bank and on deposit amounted to £2,415,706.

All of the Company's cash and cash equivalents as at 30 June 2016 are held in interest bearing accounts. The Company has not invested in any short-term commercial paper, asset backed securities or other financial instruments.

In management's view the Company has sufficient financial resources to fund currently planned exploration programmes and ongoing operating expenditures over the next 12 months, which are reviewed and adjusted on a regular basis as appropriate and in line with the financial resources of the Company. The Company will continue to be dependent on raising equity capital as required until and unless it reaches the production stage and generates cash flow from operations.

#### **Contractual Obligations**

£	Payments Due by	y Period	
	Total	Less than 1	Greater than 1
		year	year
Operating leases	25,659	25,659	-
Capital Commitments	7,485	7,485	-

Operating leases relate to office space. Capital commitments relate to contractual commitments for metallurgical, economic and environmental evaluations by third parties. Once incurred these costs will be capitalised as intangible exploration asset additions.

For details concerning the commitments associated with the purchase of GAP, refer to 'Details of Glencore Transaction'. For details of the contingent consideration payable to the former owners of Teck Cominco Brasil S.A., refer to 'Contingent consideration payable'

#### **Transactions with Related Parties**

The charges levied during the six months ended 30 June 2016 and the comparative period in 2015 are as follows and cancel out upon consolidation:

>>	Total	
	6 m/e	
	30 June	6 m/e
	2016	30 June 2015
>>	£	£
>> Intragroup charges	567,589	427,513

#### **Critical Accounting Policies and Estimates**

The financial information disclosed within this document was prepared on a going concern basis using accounting policies consistent with International Financial Reporting Standards (IFRS).

The preparation of financial statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the end of each reporting period.

Significant items subject to such estimates include:

#### Valuation of Intangible Assets

In accordance with IFRS 6, the Company capitalises as Intangible Assets all exploration and evaluation costs, including acquisition costs, field exploration and analysis costs relating to specific properties until those properties are brought into production, at which time they will be amortised on a unit-of-production basis or until the properties are abandoned, sold or considered to be impaired in value, at which time an appropriate charge is made.

Intangible Assets are reviewed for impairment to determine if a write down of their carrying amount is required. Each exploration project is subject to an annual review by either a consultant or senior company geologist to determine if the exploration results returned to date warrant further exploration expenditure and have the potential to result in an economic discovery. This review takes into consideration long-term metal prices, anticipated resource volumes and grades, permitting and infrastructure. In the event that a project does not represent an economic exploration target and results indicate there is no additional upside, a decision will be made to discontinue exploration. The Directors have reviewed the estimated value of each project prepared by management and consider no impairment charge necessary for the six months ended 30 June 2016.

#### Estimated impairment of goodwill

Goodwill has a carrying value at 30 June 2016 of £262,202 (30 June 2015: £229,622). The Group tests annually whether goodwill has suffered any impairment, as per intangible assets. The change in value of goodwill is due to exchange rate movements. Management have concluded that there is no impairment charge necessary to the carrying value of goodwill.

Fair value of exploration assets acquired in business combinations

Management has made various estimations regarding the fair value of exploration assets acquired in the absence of NI 43-101 compliant resource data available at acquisition. The fair value of exploration assets acquired has been estimated based on a number of valuation techniques.

Where acquisitions represent transactions between knowledgeable and willing parties on an arm's length basis the exploration assets acquired have been valued on the basis of the consideration transferred. Where acquisitions do not represent arm's length transactions management have compared them to similar transactions that are on an arm's length basis taking into account key factors such as certainty over the level of defined resource, processing technology and location infrastructure.

Management has also undertaken an exercise to compare their estimated fair values based on the level of work completed and geological upside potential with similar exploration companies in the form of a benchmarking exercise.

#### Contingent consideration

Contingent Consideration payable to the former owners of Teck Cominco Brasil S.A.

Contingent consideration payable to the former owners of Teck Cominco Brasil S.A. has a carrying value of £2,637,724 at 30 June 2016 (30 June 2015: £ 2,452,538). The fair value of the contingent consideration arrangement with the former owners of Teck Cominco Brasil S.A. was estimated at the acquisition date according to when future taxable profits against which the tax losses may be utilised were anticipated to arise. The fair value estimates were based on the current rates of tax on profits in Brazil of 34%. A discount factor of 7.0% was applied to the future dates at which the tax losses will be utilised and consideration paid.

As at 30 June 2016, there was a finance expense of £83,000 (30 June 2015: £161,963) recognised in finance costs within the Condensed Statement of Comprehensive Income in respect of this contingent consideration arrangement, as the discount applied to the contingent consideration at the date of acquisition was unwound.

The cash flow model used to estimate the contingent consideration was adjusted, to take into account changed assumptions in the timing of cash flows as derived from the Pre-Feasibility Study as published by the Group in March 2014. The key assumptions underlying the cash flow model derived from the Pre-Feasibility Study as published by the Group in March 2014 are unchanged as at 30 June 2016, other than that in 2015 the assumed date for commencement of commercial production was revised from 2017 to 2019. The change in the fair value of contingent consideration payable to the former owners of Teck Cominco Brasil S.A. generated a charge to profit or loss of £189,971 for the six months ended 30 June 2016 (30 June 2015: £55,063 charge) due to changes in the functional currency in which the liability is payable.

Contingent Consideration payable to Xstrata Brasil Mineração Ltda The contingent consideration payable to Xstrata Brasil Mineração Ltda has a carrying value of £3,170,131 at 30 June 2016 (30 June 2015: £ nil). It comprises two elements: US\$1,000,000 due after the date of issuance of a joint feasibility study for the combined Enlarged Project areas and to be satisfied by shares or cash, together with US\$5,000,000 consideration in cash as at the date of first commercial production from any of the resource areas within the Enlarged Project area. The key assumptions underlying the treatment of the contingent consideration the US\$5,000,000 are as per those applied to the contingent consideration payable to the former owners of Teck Cominco Brasil S.A.

As at 30 June 2016, there was a finance expense of £89,925 (2015: £nil) recognised in finance costs within the Statement of Comprehensive Income in respect of this contingent consideration arrangement, as the discount applied to the contingent consideration at the date of acquisition was unwound.

The change in the fair value of contingent consideration payable to Xstrata Brasil Mineração Ltda generated a charge to profit or loss of £273,330 for the six months ended 30 June 2016 (30 June 2015: £nil) due to changes in the functional currency in which the liability is payable.

The operating and financial assumptions used to determine the crystallisation of the Xstrata Contingent Consideration are as per those used for the Teck Contingent Consideration. The commitments in connection with the Xstrata Contingent Consideration are set out in 'Details of Glencore Transaction'.

#### Current and deferred taxation

The Company is subject to income taxes in numerous jurisdictions. Judgment is required in determining the worldwide provision for such taxes. The Company recognises liabilities for anticipated tax issues based on estimates of whether additional taxes will be due. Where the final tax outcome of these matters is different from the amounts that were initially recorded, such differences will affect the current and deferred income tax assets and liabilities in the period in which such determination is made.

Deferred tax liabilities have been recognised on the fair value gains in exploration assets arising on the acquisitions of Teck Brasil and Lontra. A deferred tax asset has been recognised on acquisition of Teck Cominco Brasil S.A for the utilisation of the available tax losses acquired. Should the actual final outcome regarding the utilisation of these losses be different from management's estimations, the Company may need to revise the carrying value of this asset.

#### **Forward Looking Statements**

Except for statements of historical fact relating to the Company, certain information contained in this management's discussion and analysis constitutes 'forward-looking information' under Canadian securities legislation. Forward-looking information includes, but is not limited to, statements with respect to the potential of the Company's properties; the future price of minerals; success of exploration activities; cost and timing of future exploration and development; the estimation of mineral resources; requirements for additional capital and other statements relating to the financial and business prospects of the Company. Generally, forward-looking information can be identified by the use of forward-looking terminology such as 'plans', 'expects' or 'does not expect', 'is expected', 'budget', 'scheduled', 'estimates', 'forecasts', 'intends', 'anticipates' or 'does not anticipate', or 'believes', or variations of such words and phrases or statements that certain actions, events or results 'may', 'could', 'would', 'might' or 'will be taken', 'occur' or 'be achieved'. Forward-looking information is inherently subject to known and unknown risks, uncertainties and other factors that may cause the actual results, level of activity, performance or achievements of the Company to be materially different from those expressed or implied by such forward-looking information, including but not limited to risks related to:

The Company's goal of creating shareholder value by concentrating on the acquisition and development of properties that have the potential to contain economic mineral deposits;

- future plans for the Araguaia Project and other property interests held by the Company or which may be acquired on a going forward basis, if at all;
- management's outlook regarding future trends;

- the Company's ability to meet its working capital needs at the current level in the short term; and
- governmental regulation and environmental liability.

Forward-looking information is based on the reasonable assumptions, estimates, analysis and opinions of management made in light of its experience and its perception of trends, current conditions and expected developments, as well as other factors that management believes to be relevant and reasonable in the circumstances at the date that such statements are made, and are inherently subject to known and unknown risks, uncertainties and other factors that may cause the actual results, level of activity, performance or achievements of the Company to be materially different from those expressed or implied by such forward-looking information, including but not limited to risks related to: unexpected events and delays during permitting; the possibility that future exploration results will not be consistent with the Company's expectations; timing and availability of external financing on acceptable terms and in light of the current decline in global liquidity and credit availability; uncertainty of mineral resources; future prices of minerals; currency exchange rates; government regulation of mining operations; failure of equipment or processes to operate as anticipated; risks inherent in mineral exploration and development including environmental hazards, industrial accidents, unusual or unexpected geological formations; and uncertain political and economic environments. Although management of the Company has attempted to identify important factors that could cause actual results to differ materially from those contained in forward-looking information, there may be other factors that cause results not to be as anticipated, estimated or intended. There can be no assurance that such statements will prove to be accurate, as actual results and future events could differ materially from those anticipated in such statements. Accordingly, readers should not place undue reliance on forward-looking information. The Company does not undertake to update any forward-looking information, except in accordance with applicable securities laws.

#### **Additional Information**

Additional information relating to the Company, including its annual financial statements for its most recently completed fiscal year as well as its annual information form are available on SEDAR at <a href="https://www.sedar.com">www.sedar.com</a>.