CONE
MINE EXPLORATION

1 - INTRODUCTION

1.1 – OBJECTIVE

The follow present report has an objective to describe the accomplished works in offices and fields for the geologic and economic description of the area referring to the Sarzedo Project of the Cone Mine Exploration. This work has a main goal elaborate an evaluation of the iron ore reserves in the area of the process, quantifying and qualifying them with accuracy.

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1.2 – MINERAL LEGISLATION IN BRAZIL

The laws that conduct the mining activities in Brazil established that the subsoil belongs to the federal government. That way, activities of prospection, exploration and exploitation just are possible with the government authorization through of its department DNPM (National Department of Mineral Production). Each process of mineral exploration is evaluated by the DNPM based in technique criteria and the authorizations are granted in two stages: Exploration License and The Mine Work Concession. The authorization holder of DNPM has full and exclusive rights about the work execution, as well about the commercialization of the area.

1.3 – MINING IN BRAZIL

Brazil stands out worldwide as one of the main producers of the minerals goods.

The mining industry in Brazil has a highest technology level and technique, being forward of a several obtained innovations in this area in the last decades.

In all regions of the country exists an extensive web of education for the formation of professional that attempt to the mining's demand. The high workforce qualification, together to good infra-structure and low productive cost becomes the mining in Brazil object of a great interest by the part of the foreign and national investors.

Brazil is the second bigger producer of the iron ore (approximately 20% of worldwide production) and the third bigger producer of bauxite (approximately 13% of the worldwide production). Data of the IBRAM (Brazilian Institute of Mining) presented that in 2008 the Brazilian mineral sector employed 161 thousand people in the mine work activity and the value of the commercialized national production was US$ 29 billion.

Adding the commercialized rude ore production to the production of the sector of mineral transformation, the mining of Brazil generated in 2008 US$ 42 billion, what represents 5.7% of the GIP. The positive scene reflects in the investments of the sector that are foreseen in US$ 47 billion between 2009 and 2013.

1.4 – Iron ore in the Iron quadrangle

The worldwide iron ore reserves (measure + indicated) are in the order of 310 billion of tons. Brazil has 6,7% of this reserves (21,0 billion tons) and it is in a 5th place between the countries which have the biggest volumes of the ore. However the high grade of iron in its ore (60,0 to 67,0% in hematite and 50,0 to 60,0% in the itabirites) takes Brazil to occupy the place of prominence in the worldwide scene, in terms of iron contained in the ore. 70% of the Brazilian reserves can find in the state of Minas Gerais (198 million tons), being the big part of these are in the iron quadrangle, traditional region in the extraction of this mineral goods. The region of the Iron quadrangle, had importants itabirite and hematite iron ore deposits of high grade (Fe > 60%).

Image 1 – Iron Ore from the Iron quadrangle

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1.4.1 – Stratigraphy

Table 1 - Simplified Stratigraphic Column of the Ferriferous-Quadrilateral - CPRM

<table>
<tr><td></td><td colspan="3">RECENT SEDIMENTARY COVERAGE</td></tr>
<tr><td rowspan="12">PROTEROZOIC</td><td>ESPINHAÇO SUPERGROUP</td><td>Conselheiro Mata Group</td><td>Cambotas Formation</td></tr>
<tr><td colspan="3">Itacolomi Group</td></tr>
<tr><td rowspan="10">MINAS SUPERGROUP</td><td rowspan="5">Piracicaba Group</td><td>Sabará Formation</td></tr>
<tr><td>Barreiro Formation</td></tr>
<tr><td>Taboões Formation</td></tr>
<tr><td>Fecho do Funil Formation</td></tr>
<tr><td>Cercadinho Formation</td></tr>
<tr><td rowspan="2">Itabira Group</td><td>Gandarela Formation</td></tr>
<tr><td>Cauê Formation</td></tr>
<tr><td rowspan="2">Caraça Group</td><td>Batatal Formation</td></tr>
<tr><td>Moeda Formation</td></tr>
<tr><td colspan="2">Tamanduá Group</td></tr>
<tr><td rowspan="5">ARCHAEAN</td><td rowspan="4">RIO DAS VELHAS SUPERGROUP</td><td rowspan="2">Maquiné Group</td><td>Casa Forte Formation</td></tr>
<tr><td>Palmital Formation</td></tr>
<tr><td>Nova Lima Group</td><td>Schist meta-sedimentary and metavolcanic</td></tr>
<tr><td>Quebra-Osso Group</td><td>Metavolcanic mafic-ultramafic Association</td></tr>
<tr><td colspan="3">GRANITE-GNEISSIC-ARCHAEAN TERRAIN</td></tr>
</table>

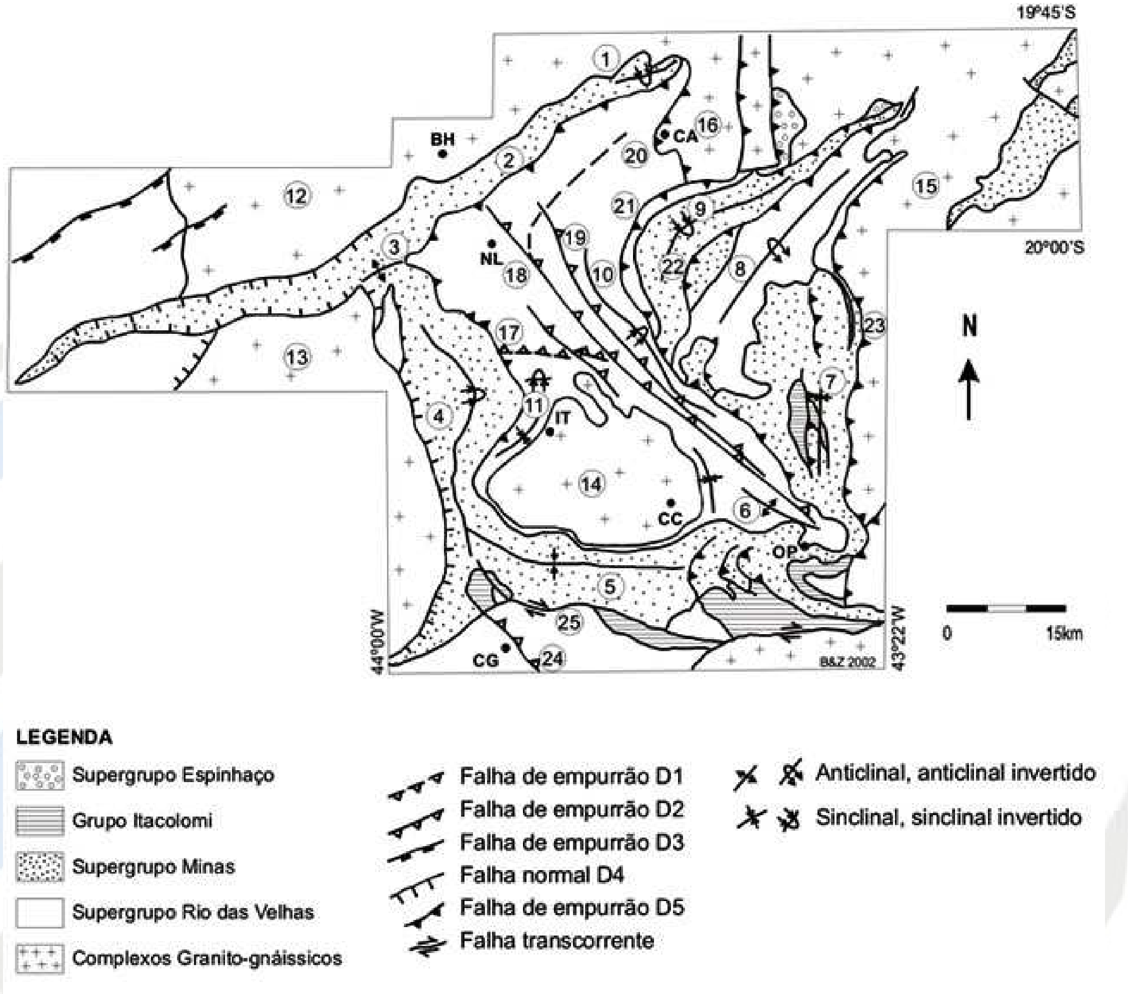


Image 2 - Structural Map of the Iron Quadrangle - CPRM

Subtitles: Fold: 1 - Syncline Piedade, 2 - Homocline Serra do Curral, 3 - Anticline Serra do Curral, 4 - Moeda Sincline, 5 - Dom Bosco Sincline, 6 - Mariana Anticline, 7 - Syncline Santa Rita, 8 - Anticline Conceição, 9 - Syncline Gandarela, 10 - Syncline Vargem do Lima, 11 – Andaimes Syncline. Granite-gneiss Complex: 12 - Belo Horizonte, 13 - Bonfim, 14 - Bação, 15 - Santa Bárbara, 16 - Caeté. Falhas: 17-Bem-Te-Vi, 18 - São Vicente, 19 - Raposos, 20 - Caeté, 21 - Cambotas, 22 - Fundão, 23 - Água Quente, 24 - Congonhas, 25 - Engenho. Cidades: BH - Belo Horizonte, CC - Cachoeira do Campo, IT - Itabirito, NL - Nova Lima, CA - Caeté, CG - Congonhas, OP - Ouro Preto.

1.4.2 – Basic Geology of the Iron Quadrangle

The crystalline basement of the Iron Quadrangle is compound by the gneissic metamorphic complex denominated of Bonfim Complex and Moeda Complex (west side of the Moeda Mountain), Congonhas Complex (to southwest of Iron Quadrangle); Santa Rita Complex (to southwest of the Ouro Branco Mountain Range); Caeté Complex (to east of the Caeté town); Belo Horizonte Complex (to the north of the Curral Mountain); Santa Bárbara Complex (to the east of the Caraça Mountain Range) and Bação Complex (which it is in the center of the Iron Quadrangle).

Geocronological Analyses in rocks' samples by some of these complexes, revealed ages of 2,9-3,2 Ga. And also, two generations of plutons for the Neoarchaean: 2,78-2,77 Ga. (calcium alkaline plutons) and 2,73-2,62 Ga. (granites anorogenic).

Rio das Velhas Supergroup

The ages between 2,776 Ga. and 2,857 Ga. allows say that the Rio das Velhas Supergroup along with the plutonic rocks represents a typical terrain granite-greenstone of the Archaean.

The metavolcanic and metasedimentary rocks form the Rio das Velhas Supergroup, subdividing in two groups (Nova Lima (base) and Maquiné (top)). The Maquiné Group divide in two formations:

- Palmital Formation (base); compound by quartz sericite, quartz phyllite and phyllite.
- Casa Forte Formation; compound by quartz sericite, chloritic, schists and phyllite.

The Nova Lima Group represents a sequence of a “greenstone belt” type subdividing in three units, from the bottom to the top:

- Metavolcanic Unit; compound by serpentine, steatite, Talc-schists, amphibolites metamorphosed, metabasalt and metatuffs, besides of komatiites with spinifex structure.
- Chemistry Metasedimentary Unity, represented by carbonetic schists, metacherts, banded iron formation and phyllites:
- Clastic Metasedimentary Unity, represented by quartz-schists, quartz phyllites, impure quartzite and meta-conglomerates.

Minas Supergroup

The Minas Supergroup is subdividing from the base to the top in the Tamanduá, Caraça, Itabira and Piracicaba Group.

The Tamanduá Group is represented by a set of by a set of quartzite, phyllite, quartz and clay shists, itabirites phyllite and dolomite, conglomerates and coarse quartzite.

The Group Caraça is compound by the Caraça quartzite (Moeda Formation) and Batatal schists (Batatal Formation)

- Moeda Formation represented by conglomerates and coarse quartzite of fluvial origin and fine quartzite and phyllites by transitional-marine origin.
- Batatal Formation; constituted by phyllites sericites, graphitic and locally this formation can presents chloritic and carbonate sediments, being that in the superior part can be seen fine layers of chert and hematite.

The Itabira Group divides in two formations, from the base to the top:

- Cauê Formation; predominatly represented by a iron formation of lake superior kind and subordinate by dolomiticos and amphibolitics itabiritos with small phyllites lenses and marl and some manganiferous horizons.

- Gandarela Formation; compound by layers of carbonate rocks represented by dolomite and subordinate by itabiritos, dolomitic phyllites and phyllites.

The Piracicaba Group divides in five formations, from the base to the top:

- Cercadinho Formation; represented by ferruginous quartzite, ferruginous phyllite, phyllite, quartzite and small interpolated of dolomite;

- Fecho do Funil Formation: represented by dolomitic phyllite, phyllite and impure dolomite;

- Taboões Formation: represented by fine and massive quartzite;

- Barreiro Formation: represented by phyllite and graphitic phyllite;

-Sabará Formation: represented by phyllite, chlorite-schist, greywacke and locally tuffs and cherts.

Itacolomi Group

The Itacolomi Group is represented by quartzite, conglomeratic quartzite and lenses of conglomerate with pebbles of itabirito, phyllite, quartzite and vein quartzite, deposited in coastal and deltaic environment.

1.4.3 – Itabirites of the Iron Quadrangle

The Itabirites are compound by iron rich bands (mainly hematite and magnetite) interpolated with quartz and/or dolomite rich bands (BIF- banded iron formations). The high grade iron ore are mainly compound by hematite, being used directly in blast furnace, as granulated ore.

The area of the process is in the Sarzedo County, main center of ore leakage of small and mid range producers of Minas Gerais. The proximity with the load terminal minimizes the cost of the road transport and makes possible the maximum exploitation of the coal bed.

2 – PHYSIOGRAPHIC ASPECTS

2.1 – Vegetation

The vegetation in this region can be classified into three types: savanna characterized by twisted trees size; rocky fields marked by small trees and grasses, and tropical forest consisting of dense vegetation along rivers and drainages.

2.2 – Clime

The climate is defined as mild temperate with mild summer and mild winter. This climate type occurs mainly near the headwaters of rivers and streams where the altitudes are higher, around 1000 meters.

The average annual temperature is 19.9ºC, while the maximum is 26.3ºC and minimum annual temperature is 15.2ºC.

The hydrological period in the region is divided into two seasons: rainy season (October to March) and dry season (April to September).

2.3 – Hydrographic

The study area belongs to Paraopeba River Basin, which together with the river basins of Pará and Velhas, these respectively west and east, comprising the southeastern portion of São Francisco River basin. The Paraopeba is located to the west of this work area near to Mario Campos and Brumadinho.

3 – LOCAL GEOLOGY

In the area of this is charter exploration occur rocks of Groups Itabira and Piracicaba. The Itabira is represented by formations Cauê and Gandarela, Piracicaba only by formations Cercadinho and Fecho do Funil.

The rocks have an E-W direction with dips predominantly between 45 and 60 degrees south with some local variations caused by asymmetric side bending by oblique faulting to the general direction.

3.1 – ITABIRA GROUP

3.1.1 – Cauê Formation

The Cauê formation is located at the southern tip of the area, the higher portion above topographic dimensions greater than 1200 meters. In the present case, this formation shows mostly amphibolites itabirites and carbonate itabirites (dolomite), there are also less frequently of silica itabirites.

3.1.2 – Gandarela Formation

The Gandarela formation is located in the center and south of the decree making a thick band from east to west. It occupies the less high and the valley bottoms, in topographic quotas smoother and generally less than 1200 meters.

The transition from formation Cauê to formation Gandarela occurs with increasing frequency of itabirites carbonate (dolomite). In the present case, this lithostratigraphic unit is also composed of amphibolites itabirites, lenses of silica itabirites friable rich and manganiferous itabirite powders with average iron content. Also present ferruginous laterite and rolled deposit.

3.2 – PIRACICABA GROUP

3.2.1 – Cercadinho Formation

In the study area the Cercadinho formation is located in the central portion, occupying a east to west band.

In the Midwest sector of the area, the northern peak of the Three Brothers shows very high quotas between 1300 and 1320 meters, especially in the region geographically, forming an alignment in the east-west range parallel to the Curral Mountain, probably due to faulting. In this region the Cercadinho formation is composed of quartzite compact semi compact bluish gray. Towards the east of the area these quartzites become more brittle.

In the study area the Cercadinho formation also shows the intercalated sericite phyllites, graphitic phyllites of light gray, those more frequent in the central sector of the area. There are dolomites and ferruginous loam in western area. The ferruginous quartzites are locally very rich in detrital hematite.

3.2.2 – Fecho do Funil Formation

This formation occurs throughout the northern end of the study area occupying a narrower range. Shows topography smoother.

The main rocks that outcrop in the Fecho do Funil formation are quartz phyllite, dolomitic phyllite, siliceous dolomites.

In the study area this formation shows successive intercalated sericite phyllites, quartzites, dolomitic phyllites and stromatolitic metadolomites.

The dolomitic phyllites show slides of up to 2.0 mm thick, light gray, soft, creamy and silky to the touch, consisting of phyllosilicates very changed, difficult to identify macroscopically alternating with blades up to 3.0 mm in thickness, soft gray color that also react with the hydrochloric acid.

3.3 – INTRUSIVE

In the explored area there is gabbro intrusion into the holes 15, 16 and 20. Possibly this intrusion is in a dike shape, filling apparently normal fault, with overall direction S40E/N40W, oblique to the Curral Mountain, showing the sunken block of NE side and uplifted block of SW side of the fault plane.

The fault above shows some evidence on the surface. The first evidence is in the uplifted block of SW side of the fault, in which highest topographic quotas are observed in the crest of the Curral Mountain (in itabirites of the Itabira Group) and in the quartzite of the Cercadinho formation, these quartzites are located in the Midwest sector the area, north of the peak of the Three Brothers.

The second evidence shows drainage (talwegs) with the same direction (S40E/N40W), either located on north side of the crest of Curral Mountain as in the quartzite above, possibly along the fault plane.

Another evidence is that the block is downgraded from NE side of the fault shows crest much closer either in the itabirites of the Curral Mountain as in the quartzite from Cercadinho formation.

In the present area gabbro does not emerges. In the hole 15 gabbro starts with 5.90 meters depth being observed until the end of the hole (47.70 meters) in hole 16 gabbro starts with the 42.45 meters was observed until the end of the hole (68.45 meters), but in hole 20, the gabbro is located in 29.55 meters to 65.10 meters, is interspersed up with a rolled and down with a powder manganiferous itabirite, finishing in 81.95 meters in this itabirite reinforcing the idea that this intrusion has a dike shape.

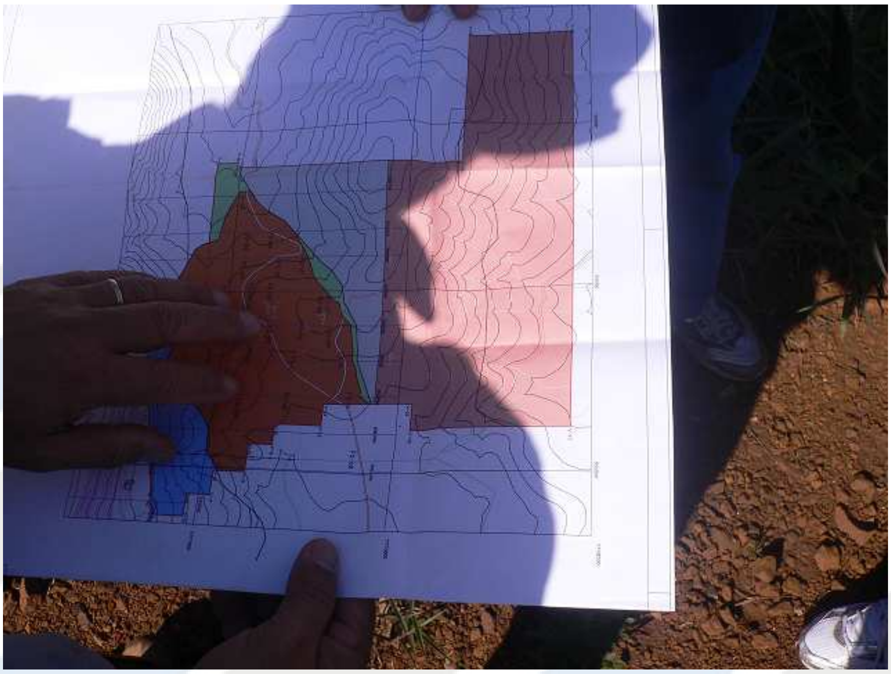
The gabbro observed in boreholes is green, shows massive structure (not banded, isotropic), its gross texture is fine phaneritic, equigranular to inequigranular, there is a dark mineral with an acicular habit, black euhedral mineral, very small green amphiboles with an acicular habit and slightly radial fibers. It breaks along the fractures showing films dark blue gray appearing iron oxide and manganese.

Small intercalation of intrusive rocks very altered, soft ocher-colored to brown, composed essentially by clay, were observed in some boreholes.

4 – FIELD PHOTOGRAPHY MEMORIAL

Photograph 1 – Mining next to the process

Photograph 2 – Image of the region



Photograph 3 – Geological Sections Interpretation

Photograph 4 – Borehole Details

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Photograph 5 - Outcrops

5 – NEAREST MINING

Near to the local of the process are some of others process that have the mine work concession, including the mining of the VALE Company as the Feijão Mine, belongs to the old Ferteco and incorporated by VALE in August of 2003, that have an ore production ROM in 2006 of 8.455.457 tons.

Image 3 - Nearby mining

6 – ALLOCATION

Image 3 - Allocation (Base – IBGE)

Image 4 - Allocation

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7 – SARZEDO COUNTY

7.1 – Characterization

Allocation: CENTRAL

Area: 62,17 Km^2

Altitude:

Maximum: 0 m

Place:

Minimum: 0 m

Place:

Central point of the city: 767,31 m

Temperature:

Average annual:	21,1° C
Maximum average annual:	27,1° C
Minimum average annual:	16,7 °C

Average Annual Rainfall: 1491,3 mm

Relief:

Topography %

Main Rivers:

Bay: RIO SAO FRANCISCO BAY

Sources: Institute of Applied Geosciences - IGA
Brazilian Institute of Geography and Statistics - IBGE

7.2 – Population

2000 / 2005

YEARS	URBAN	RURAL	TOTAL
2000	14.700	2.540	17.240
2005(1)			22.329

Source: Brazilian Institute of Geography and Statistics - (IBGE)

(1) Preliminary Data

7.3 – Transports

Road

Approximate Distances to the main centers (Km):

Belo Horizonte: 49
Rio de Janeiro: 463
São Paulo: 561
Brasília: 756
Vitória: 545

Main Highways that connects to Belo Horizonte:

MG-040

Boundaries Counties:

BETIM
MARIO CAMPOS
BRUMADINHO
IBIRITE

8 – LOGISTIC AND ACCESSIBILITY

8.1 – HOW TO ARRIVE

Leaving from Belo Horizonte, take the Fernão Dias Highway (BR-381) towards São Paulo. Go ahead about 25 km and take MG-155 towards Mário Campos. Go straight ahead in the center of Mário Campos through the Campo Belo Street and continue on UM Street up to the end of the pavement.

Continue towards to southeast for around 2 km by the vicinal roads.

8.2– MAIN HIGHWAYS OF ACCESS

The main access routes to the area of the process are made through the MG – 040, BR -381 and MG – 155 besides the vicinal roads next to the process area.

8.3 – AIRPORT

The main airport next to the area of the process is the Tancredo Neves International Airport, located in the Confins County – MG, metropolitan region of Belo Horizonte, in a trajectory of approximately 85 km up to the area. Another important airport present in Belo Horizonte is the Pampulha Airport, which was considered an international airport before the transference of its activities to the Tancredo Neves International Airport. Nowadays Pampulha operates just the regional flights. This airport is located about 55 km of distance to the area of the process, being its access by the Tancredo Neves International Airport route, through BR-381.

Image 5 - Partial View of the Tancredo Neves International Airport

8.4 – RAILROADS

The most near railways is the MRS logistic, that connect the state of Minas Gerais to some mainly brazilian ports as of Rio de Janeiro, Guaíba and Itaguaí, and the Railway Vitória-Minas (EFVM), under the responsibility of the Vale do Rio Doce that leak the large part of iron ore from the state of Minas Gerais up to Tubarão port in Espírito Santo. The Shipment of the iron ore can be made in the Sarzedo County, through of the Load Terminal of Sarzedo, under the responsibility of the Link Logistic Group, which is located around 9 km of distance by the area of the process.

8.4.1 – Load Terminal of Sarzedo

Launched in 2006, located about 40 km of the center of Belo Horizonte, with railroad access of the MRS Logistic and an area of 700 thousand square meters, the Load terminal of Sarzedo movement actually around eight million of tons per year, distributed between Containers, Pig-Iron and Iron Ore, among others loads. Through of the established partnership between the Link Logistic Group, the railway MRS Logistic and the Triunfo Operadora Portuária, was created a new channel of Pig-Iron exportation by the Rio de Janeiro Port. Nowadays, the group is already responsible by the leaking of more than a half of the Pig-iron production from the south system, having concluded the year of 2007 with more than one million tons shipped.

The terminal located in the rural region of the Sarzedo County, was designed for a initial load capacity of 150.000 tons/month, attending an increasing demand by the railroad transport, by ores and others region's product. It was built throughout the railroad of the MRS Logistic and extends for 1.400 meters.

Image 6 - Area of iron ore storage, already existing

The MRS logistic, managed by the VALE, is a concessionary that operates the call “Southeast Mesh” of the Federal Railways Network S.A. It is responsible by the iron ore and pig ore transport which are stored at the Load Terminal of Sarzedo.

The mesh of MRS gives railroad access to the main Brazilian ports: Rio de Janeiro, Itaguaí and Santos, besides attend to the privative terminal of iron ore shipment in the Guaíba Island, located in Angra dos Reis. The market of the load transports in the area of the mesh influence of MRS is extremely favorable to the railway sector, means by the nature of the active products, means by the demand punctual concentration. In this region concentrates 65% of Brazil’s gross domestic product and are installed in the largest industries in the country (mainly siderurgy and cement plants).

8.4.1.1 – Access to the Load Terminal of Sarzedo

The access to the load terminal of Sarzedo, starting from the process area, it can be done taking the road that connects up to Mário Campos (Três Street) up to MG-040. Follow in this same road in direction to the Sarzedo County. In this county follow through the parallel road to the railway line which will give access to the load terminal.

Image 7 - Load Trains of the MRS Logistic

Image 8 - MRS' Railway Network

LINK: http://www.mrs.com.br/ingles/index.php

8.5 – PORTS

8.5.1 – Port of Itaguaí - RJ

The port of Itaguaí, situated at 553 km of distance (railway line) of the load terminal of Sarzedo, present an area of 10 million square meters by flat area, a channel of access with up to 20m by depth and ranks of docking in sheltered waters, with industrial logistic infrastructure and technology in telecommunication and supply, multimodal accesses and facilities of transports. Itaguaí port will offer immediately cost reduction for the user in an international level of productivity. The Itaguaí Port, modernized to follow the competitiveness of the national and international port trade, will be the 1st HUB PORT of the South Atlantic. In a distance of 500 km are located productive agents responsible by the formation around 70% of the Brazilian GDP (Gross Domestic Product). It is a singular port between the Brazilian and Latin-American ports. With competitive physics characteristic, have a maritime access to receive big and updated ships above of 6.000 TEUs.

Terminal of Ore – To assist the crescent demand of its ore, Vale is developing in the Itaguaí Port an investment of US$ 120 million dollars. With that it will be enable to export, in the future, from 15 to 20 million tons of iron ore. In the future it will assist ships with up to 230 thousand DWT, in a pier with depth of 18,7m. Its modern equipments allow the ship's loading in a rate up to 10 thousand tons/hour. For the second stage, after additional dredging for 20 meters of depth, the Terminal of Ore Exportation will load super bulkers with up to 230.000 DWT, so assisting the tendency prevailed in the transoceanic trade of the bulks. Through the MRS railroad capable to move up to 70 million tons of iron ore per year.

The MRS has exclusive access to the terminal of the Itaguaí Port, among them the Sepetiba Tecon (Containers), CSN Tecar (Bulks) and CPBS - VALE (Iron Ore Exportation).

Image 9 - Partial View of the Itaguaí Port.

8.5.2 – BRAZORE - Port Terminal in the Sepetiba Bay - RJ

An Adriana Resources Inc. through its subsidiary in Brazil, the BRAZORE, is developing an iron ore port in the Brazilian coast, which will operate initially with a capacity of twenty million tons per year with prevision of expansion to the fifty million tons through the development of the deep sea port terminal.

The port area is located 70 kilometers west-bound Rio de Janeiro in the Sepetiba Bay in Brazilian coast, and have direct access to the extensive railway and transportation network. The property consists in 857.575 square meters of low area in the east of Itacuruça Channel. The MRS Logistic Railway passes through the northen edge of the property. The Highway BR-101 runs parallel to the railway, and the Highway RJ-14 runs next to the western side of the property. The Ingussu River forms the eastern boundary and a smaller river called Rio do Papai runs through the property near the western boundary.

The port potential building should start in 2009, and should take from 18 to 24 months to be ready. The fast-start installation will consist of railway wagon receiving, storage, recovery and equipment of barge loading. The iron ore will be loaded in a transfer barge Seabulk of shallow draft “lighters” which will carry and load it directly on the oceanic vessels employees in the transport and maritime trade of iron ore. This transshipment will occur in a deeply place approximately distant 8 nautical miles from the port. With the processed quantity increase, the installation of the terminal will be expanded and will become more efficient with addition of collector forklift stacker-reclaimers and a second anchorage for loading. The maritime capacity will be expanded and will become efficient with the integration of storage floating and transfer vessel permanently anchored near the coast.

Image 10 - Illustration of the transshipment vessel.

Competitive Advantage

- The port site is located 70 kilometers west-bound Rio de Janeiro in the Sepetiba Bay in Brazilian coast, and have direct access to the extensive railway and transportation network.
- The port will provide access to the global steel market for the iron producers and minimized the bottleneck in the iron ore exportation in Brazil.
- Strategic partners ArcelorMittal, Worldlink Resources Ltd and Athena Resources LLC.
- Opportunity to determine the strategic working relations with significant number of independently iron mines, and also with deposit of iron ore and mines acquires recently by big mining company, with or without port limited access.
- The urbanization, globalization and industrialization in China, Índia and others emerging countries indicates the needs to expand the capacity of the iron ore exportation.

- The Iron Quadrangle, located in the Minas Gerais States in Brazil, provides access to some of the largest iron coal bed unexplored in the world.

The Company is evaluating iron ore projects in Brazil, especially in Minas Gerais with a view to obtaining participation on this project of the iron ore or mine development, being the increase of the metals demand, specifically iron ore, in countries that are developing as China and India has created some of the best infrastructure in the last years.

The opportunity of infrastructure in Brazil to the independent iron ore port, become an excellent opportunity to capitalize the restricted market of the many small and medium iron ore producers located in the State of Minas Gerais.

Image 11 - Proposed place for anchorage of the transshipment vessel.

Link : http://www.adrianaresources.com/splash/

8.5.3 LLX – Southeast Port– RJ

The Southeast Port is a privative terminal of mixing use located in the Itaguaí County, Sepetiba Bay, Rio de Janeiro, next to the public port of Itaguaí.

With a depth of 20 meters, the Southeast Port will be able to receive ships capesize, and will be used for shipment of iron ore.

With an internal area of 52,1 hectares, the Southeast Port will shelter court to stockage and handling of iron ore with storage capacity of 25 million of tons per year (mtpa), in a first phase, may expanding its capacity to 50 million (mtpa) in a 2nd phase. The LLX have already got the previous environmental license for 2 cradles with total of 50 million tons per year.

Image 12 - Artistic Conception of the port in operation.

With a privileged allocation, the Southeast Port will going to benefit of the infra-structure of terrestrial and maritime access already existent. Its integration with railroad MRS (MRS Logistic S.A) will allow that the Southeast Port attend some of the main miners regions located in Minas Gerais. Besides that its connection with the future Anel Rodoviário of Rio de Janeiro will allow an easy access to the metropolitans region of Rio de Janeiro and São Paulo.

The Southeast Port will start the operations around the second semester of 2011, with the goal to accomplish the iron ore loading proceeding from the State of Minas Gerais of the MMX Southeast mines and of the other independent miners, than exploring its contiguous privileged condition to the Sepetiba Port. In the first phase, the project will have 1 cradle of mooring, which may, in the second phase, reach 2 cradles of mooring with capacity of 50 million tons per year.

Link: http://www.llx.com.br

9 – WORK DONE

Were performed the following work in the area of exploration:

9.1 – TOPOGRAPHICAL MAP

As a basis for the exploration work a topographical map was done with contour lines spaced by 5 meters which was the basis for all geological work and preliminary assessment of the potential award.

9.2- GEOLOGICAL MAP

Based on the topographic map of the concession and using a GPS was created a geological and topographical map of the concession that allowed the preparation of ten vertical geological sections which were essential in the development of a rotating probe program and estimate the potential reserve of iron ore existing in the concession.

9.3 – ROTARY DRILLING

The rotary drilling works were started following the hole program indicated in the vertical geological sections.

The beginning of the drilling work was quite delayed caused by difficulties in the accordance with the land's owners and the realization of access on the north side of Jangada Mountain (Curral Mountain). In this manner, drilling campaign started in 23/04/2009 and ending 11/08/2010.

The twenty eighth holes were executed with the designation “FS-1-North-Feijão” to “FS-28-north-Feijão” (FS – Borehole). The chronological sequence of these holes run along the same growing numbers of holes, so the hole FS-1 was made first tan hole FS-2, and so on. But four (4) holes were increased after the last hole "FS-28". The holes were enlarged FS-09; FS-07; FS-12; FS-10; in this execution order and placed at end of table-5.3.1 called “North-Drilling-Feijão” and at the end of the table-5.3.2 with the drilling summary presented next.

The rotary drilling system used was the “conventional”. The initial diameter of all boreholes was HWL. Only two holes were reduced to diameter NWL due to operational problems. In the hole FS-22 the reduced was in 87.45 meters deep and in the FS-25 in 79.65 meters.

2393.50 meters were drilled probe, generated 276 overall samples and 788 wooden boxes used to store the borehole. These boxes were identified with labels pinned on illumined the outside, with information about the name of the hole, the initial and final film in the box and the box number. Aluminum labels were also nailed the indicators stubs of the end of the maneuvers with the depth information, progress and recovery.

All probe data are summarized in the spreadsheet named "North-Drilling-Feijão" contained in Table 2.

Each borehole generated in a magnetic means a file folder containing: a description text, a cover or title page and a sampling plan, and detailed photos showing the hole number, the probe box number, the initial and final depth of these boxes and lithology contained in the shooting range. In several holes were also photographed the probe tower, the probe square with testimonials boxes and lithological details of boxes and around the hole.

Image 14 – Testimonial box of borehole (FS01)

The following tables illustrate in a condensed form all the information about the drilling campaign performed.

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Table 1 – Drilling Summary

Número do furo	Profundidade em metros	Número de amostras	Número de caixas	Data de inicio	Data de término
1	54,50	7	19	23/4/2009	10/5/2009
2	35,60	5	13	12/5/2009	14/5/2009
3	104,10	12	36	18/5/2009	29/6/2009
4	96,90	12	33	18/7/2009	7/8/2009
5	50,75	8	18	23/9/2009	25/9/2009
6	51,70	10	18	26/9/2009	29/9/2009
7	55,85	8	19	29/9/2009	30/9/2009
8	58,85	7	21	5/10/2009	7/10/2009
9	43,45	7	15	8/10/2009	9/10/2009
10	50,55	7	18	14/10/2009	15/10/2009
11	65,70	10	23	16/10/2009	20/10/2009
12	50,50	7	18	22/10/2009	26/10/2009
13	106,00	15	37	28/10/2009	6/11/2009
14	93,70	11	31	9/11/2009	25/11/2009
15	47,70	1	17	7/12/2009	11/12/2009
16	68,45	7	24	14/12/2009	17/12/2009
17	61,75	1	21	18/12/2009	22/12/2009
18	78,55	7	26	28/12/2009	12/1/2010
19	100,50	14	35	15/1/2010	25/1/2010
20	81,95	7	28	27/1/2010	3/2/2010
21	98,35	2	6	11/2/2010	19/2/2010
22	106,85	19	35	24/2/2010	16/3/2010
23	108,70	11	37	19/3/2010	26/3/2010
24	114,90	13	38	29/3/2010	7/4/2010
25	87,90	8	29	10/4/2010	17/4/2010
26	116,50	13	41	20/4/2010	3/5/2010
27	94,80	9	27	5/5/2010	18/5/2010
28	108,95	12	38	24/5/2010	28/5/2010
9*	40,95	5	12	7/6/2010	14/6/2010
7*	34,15	4	12	27/6/2010	17/7/2010
12*	53,25	6	19	21/7/2010	28/7/2010
10*	71,15	11	24	29/7/2010	11/08/2010
Total	2393,50	276	788		

Note: holes with an asterisk were subsequently increased

9.4 – CHEMICAL ANALYSIS

The generated chemical analysis from the 276 samples collected in the boreholes is represented by spreadsheet entitled "Chemical Analysis,"

The spreadsheet above contains the chemical analysis done by the methods:

- XR22L – Determination of metals / oxides (Fe, SiO_2, Al_2O_3, P, Mn, TiO_2, CaO, MgO, K_2O e Na_2O) by fusion with lithium tetraborate / X-Ray Fluorescence.
- PPC – Determination of loss on ignition test (1000°C = 1832 °F)
- VL03 – Determination of FeO (Iron II) by volumetry.

CONE
MINE EXPLORATION

Table 2 – Chemical Analyses

Análises químicas de amostras de testemunhos de sondagem

Método:

XR22L - Determinação de metais/óxidos (Fe, SiO_2, Al_2O_3, P, Mn, TiO_2, CaO, MgO, K_2O e Na_2O) por fusão com tetraborato de lítio / Fluorescência de Raios-X.

PPC - Determinação de perda ao fogo (1000ºC).

VL03 - Determinação de FeO (Ferro II) por volumetria.

Número da amostra	Fe %	FeO %	SiO2 %	Al2O3 %	P %	Mn %	TiO2 %	CaO %	MgO %	K2O %	Na2O %	PPC %
FS-1-AM-01	51,59		15,71	1,22	0,069	0,50	0,04	< 0,01	0,08	0,03	< 0,01	8,20
FS-1-AM-02	39,25		39,06	0,24	0,035	0,23	< 0,01	< 0,01	< 0,01	0,01	0,03	4,11
FS-1-AM-03	38,00		41,12	0,30	0,021	0,07	< 0,01	0,07	0,01	0,01	0,06	3,15
FS-1-AM-04	37,92		40,49	0,48	0,025	0,08	< 0,01	0,03	< 0,01	0,01	0,07	3,28
FS-1-AM-05	37,74		40,91	0,36	0,029	0,13	< 0,01	0,10	0,05	0,02	0,04	3,43
FS-1-AM-06	38,25		42,01	0,26	0,021	0,03	< 0,01	0,07	0,02	< 0,01	0,04	2,63
FS-1-AM-07	38,53		42,64	0,18	0,027	0,03	< 0,01	0,02	0,04	< 0,01	0,01	1,90
FS-2-AM-01	48,87	1,62	17,15	2,73	0,057	0,10	0,07	< 0,01	0,06	0,01	< 0,01	9,45
FS-2-AM-02	48,57	0,12	20,98	1,13	0,080	0,29	0,02	< 0,01	0,08	0,02	< 0,01	7,17
FS-2-AM-03	40,81	0,24	37,95	0,18	0,045	0,05	< 0,01	< 0,01	< 0,01	0,01	< 0,01	3,85
FS-2-AM-04	42,02	0,11	35,09	0,40	0,065	0,38	0,01	< 0,01	< 0,01	0,02	< 0,01	3,44
FS-2-AM-05	34,20	0,06	47,37	0,40	0,074	0,07	< 0,01	< 0,01	< 0,01	0,01	0,01	3,41
FS-3-AM-01	53,51		15,26	1,10	0,055	0,13	0,04	< 0,01	0,11	0,01	< 0,01	7,14
FS-3-AM-02	40,99		38,90	0,23	0,022	0,04	< 0,01	0,04	0,02	< 0,01	0,05	1,97
FS-3-AM-03	37,42		44,07	0,15	0,019	0,01	< 0,01	0,02	0,03	< 0,01	< 0,01	1,38
FS-3-AM-04	33,75		48,12	0,47	0,039	0,02	< 0,01	< 0,01	0,03	< 0,01	0,03	2,33
FS-3-AM-05	32,43		49,67	0,26	0,038	0,03	< 0,01	< 0,01	< 0,01	< 0,01	0,04	3,84
FS-3-AM-06	31,50		49,98	0,27	0,040	0,02	< 0,01	0,04	0,02	< 0,01	0,04	3,93
FS-3-AM-07	30,72		51,22	0,20	0,037	0,01	< 0,01	< 0,01	0,04	< 0,01	0,04	3,63
FS-3-AM-08	32,75		48,50	0,46	0,043	0,02	0,02	< 0,01	0,06	< 0,01	0,03	3,51
FS-3-AM-09	30,87		52,92	0,16	0,026	<0.01	< 0,01	< 0,01	0,01	< 0,01	0,01	2,98
FS-3-AM-10	33,15		49,72	0,26	0,031	0,03	< 0,01	< 0,01	0,03	< 0,01	0,04	2,40
FS-3-AM-11	32,04		49,96	0,29	0,032	0,04	< 0,01	< 0,01	< 0,01	< 0,01	0,04	3,18
FS-3-AM-12	33,07		48,38	0,21	0,037	0,04	< 0,01	0,03	< 0,01	< 0,01	0,03	3,44
amostra	%	%	%	%	%	%	%	%	%	%	%	%
FS-4-AM-01	57,01		13,10	0,68	0,038	0,02	0,01	< 0,01	0,03	0,01	< 0,01	4,86
FS-4-AM-02	46,57		28,60	0,59	0,041	0,04	0,01	< 0,01	< 0,01	0,01	< 0,01	3,18
FS-4-AM-03	51,80		21,58	0,51	0,039	0,04	0,01	< 0,01	0,01	< 0,01	< 0,01	3,31
FS-4-AM-04	37,74		43,22	0,18	0,024	0,04	< 0,01	< 0,01	< 0,01	< 0,01	< 0,01	2,11
FS-4-AM-05	35,85		46,70	0,22	0,022	0,01	< 0,01	< 0,01	< 0,01	< 0,01	< 0,01	1,68
FS-4-AM-06	40,98		39,24	0,20	0,027	0,02	0,01	< 0,01	< 0,01	< 0,01	< 0,01	1,85
FS-4-AM-07	37,09		42,90	0,24	0,032	0,01	< 0,01	< 0,01	0,01	< 0,01	< 0,01	2,58
FS-4-AM-08	31,65		49,81	0,23	0,036	0,01	< 0,01	< 0,01	< 0,01	< 0,01	< 0,01	4,01
FS-4-AM-09	32,56		48,66	0,08	0,036	0,02	< 0,01	< 0,01	< 0,01	< 0,01	< 0,01	4,46
FS-4-AM-10	28,93		55,17	0,11	0,031	0,03	< 0,01	0,02	< 0,01	< 0,01	< 0,01	3,63
FS-4-AM-11	35,01		45,23	0,36	0,032	0,02	0,03	0,02	< 0,01	0,01	0,02	3,45
FS-4-AM-12	30,32		52,47	0,32	0,042	0,01	0,01	< 0,01	< 0,01	< 0,01	0,01	3,79
FS-5-AM-01	50,43	1,61	8,14	10,45	0,071	0,04	0,61	< 0,01	0,09	0,06	< 0,01	7,76
FS-5-AM-02	31,97	0,26	21,65	20,64	0,062	0,04	1,20	< 0,01	0,10	0,19	< 0,01	11,25
FS-5-AM-03	55,91	0,27	6,01	6,15	0,073	0,07	0,55	< 0,01	0,14	< 0,01	< 0,01	7,24
FS-5-AM-04	21,09	0,13	30,02	24,39	0,054	0,07	3,66	< 0,01	0,02	0,01	< 0,01	11,85
FS-5-AM-05	19,48	0,13	30,83	25,30	0,072	0,08	4,43	< 0,01	0,02	0,02	0,09	12,07
FS-5-AM-06	19,93	0,06	30,46	25,16	0,068	0,08	4,66	< 0,01	0,02	0,01	< 0,01	12,01
FS-5-AM-07	19,86	0,25	29,94	24,72	0,066	0,07	4,54	< 0,01	0,03	< 0,01	0,02	11,88
FS-5-AM-08	46,09	1,90	20,35	5,73	0,039	0,44	0,33	< 0,01	0,07	< 0,01	< 0,01	7,11
FS-6-AM-01	47,68	1,80	9,68	11,36	0,069	0,17	0,97	0,01	0,07	0,02	< 0,01	9,06
FS-6-AM-02	49,87	0,39	10,35	9,15	0,055	0,16	0,89	< 0,01	0,09	0,02	< 0,01	7,95
FS-6-AM-03	55,26	0,14	6,89	6,69	0,058	0,12	0,76	< 0,01	0,04	0,01	< 0,01	6,62
FS-6-AM-04	58,99	0,41	5,09	4,74	0,052	0,09	0,39	< 0,01	0,03	0,01	< 0,01	3,96
FS-6-AM-05	41,22	0,42	26,05	8,97	0,033	0,16	0,67	< 0,01	0,10	0,07	< 0,01	5,27
FS-6-AM-06	23,45	0,14	42,25	13,36	0,026	0,35	0,61	0,02	0,40	0,05	0,04	9,23
FS-6-AM-07	16,04	< 0,01	41,25	17,69	0,097	2,20	1,21	0,01	0,96	2,39	0,11	8,69
FS-6-AM-08	17,78	< 0,01	44,97	17,65	0,030	0,21	0,91	0,02	0,58	0,46	0,07	8,99
FS-6-AM-09	21,05	< 0,01	46,90	12,54	0,054	0,18	0,79	< 0,01	0,46	0,76	0,06	8,21
FS-6-AM-10	34,61	< 0,01	18,71	18,49	0,081	0,04	1,47	< 0,01	0,03	0,04	< 0,01	10,97

Número da amostra	Fe %	FeO %	SiO2 %	Al2O3 %	P %	Mn %	TiO2 %	CaO %	MgO %	K2O %	Na2O %	PPC %
FS-7-AM-01	47,47	1,96	7,34	13,68	0,089	0,04	1,03	< 0,01	0,07	0,05	< 0,01	9,21
FS-7-AM-02	51,85	0,11	8,04	10,34	0,082	0,05	0,77	< 0,01	0,08	0,05	< 0,01	6,19
FS-7-AM-03	20,63	< 0,01	40,13	16,66	0,081	0,28	1,14	0,01	0,65	0,71	0,07	9,77
FS-7-AM-04	33,60	0,11	18,84	19,77	0,085	0,05	1,47	< 0,01	0,04	0,06	< 0,01	11,05
FS-7-AM-05	35,00	0,13	17,92	18,12	0,096	0,03	1,54	< 0,01	0,05	0,04	< 0,01	12,14
FS-7-AM-06	34,18	0,06	18,33	18,84	0,088	0,04	1,55	< 0,01	0,03	0,04	< 0,01	11,43
FS-7-AM-07	36,37	0,11	16,37	17,61	0,103	0,03	1,52	< 0,01	0,04	0,04	< 0,01	11,80
FS-7-AM-08	35,94	< 0,01	18,58	17,07	0,102	0,03	1,54	0,02	0,04	0,04	0,03	11,48
FS-7-AM-09	37,20	0,23	23,03	13,65	0,083	0,05	1,33	0,02	0,05	0,03	< 0,01	9,09
FS-7-AM-10	32,77	0,15	31,98	11,97	0,080	0,07	1,33	0,02	0,03	0,04	< 0,01	8,00
FS-7-AM-11	33,50	0,15	34,56	8,74	0,073	0,10	1,00	0,01	0,03	0,03	0,02	6,66
FS-7-AM-12	29,54	0,15	38,58	10,85	0,065	0,19	1,18	0,01	0,04	0,06	0,01	6,28
FS-8-AM-01	30,28	< 0,01	24,73	20,11	0,048	0,23	1,32	< 0,01	0,05	0,05	< 0,01	9,80
FS-8-AM-02	43,00	0,07	17,43	12,14	0,046	0,27	0,82	< 0,01	0,06	0,02	< 0,01	7,40
FS-8-AM-03	37,83	< 0,01	15,34	3,79	0,151	10,88	0,16	< 0,01	0,11	0,06	< 0,01	13,37
FS-8-AM-04	34,35	< 0,01	17,67	3,80	0,149	12,57	0,19	< 0,01	0,08	0,03	< 0,01	13,83
FS-8-AM-05	28,69	3,54	15,10	25,86	0,070	0,02	1,60	< 0,01	0,05	0,10	0,01	15,60
FS-8-AM-06	22,27	0,13	24,65	28,03	0,058	0,03	1,64	< 0,01	0,05	0,16	< 0,01	13,25
FS-8-AM-07	27,45	0,06	30,36	18,34	0,036	0,30	0,93	< 0,01	0,20	0,06	0,02	10,30
FS-9-AM-01	52,85	0,41	3,97	9,48	0,064	0,27	0,44	< 0,01	0,18	0,02	< 0,01	9,95
FS-9-AM-02	54,40	0,22	5,79	6,15	0,025	0,49	0,28	< 0,01	0,24	< 0,01	< 0,01	9,46
FS-9-AM-03	50,16	0,13	11,72	5,71	0,026	0,50	0,22	< 0,01	0,25	< 0,01	0,01	9,02
FS-9-AM-04	47,24	< 0,01	16,71	5,80	0,027	0,74	0,20	< 0,01	0,16	0,01	< 0,01	8,19
FS-9-AM-05	46,16	< 0,01	17,32	5,23	0,029	1,68	0,20	< 0,01	0,17	0,07	0,01	8,64
FS-9-AM-06	46,88	< 0,01	17,06	4,50	0,049	1,27	0,22	< 0,01	0,21	0,03	< 0,01	8,55
FS-9-AM-07	47,68	< 0,01	16,06	4,41	0,048	1,14	0,23	< 0,01	0,22	0,02	< 0,01	9,00
FS-9-AM-08	50,70	0,15	9,59	4,56	0,080	1,34	0,28	0,02	0,31	0,02	0,01	9,91
FS-9-AM-09	51,69	0,15	10,02	4,77	0,077	1,76	0,29	0,02	0,30	0,03	0,17	9,67
FS-9-AM-10	52,56	0,15	14,43	1,90	0,021	3,18	0,05	0,02	0,04	0,12	0,07	2,40
FS-9-AM-11	36,09	0,15	30,69	6,28	0,062	2,17	0,26	0,01	0,10	0,04	0,04	6,16
FS-9-AM-12	30,63	0,15	32,24	9,42	0,100	2,55	0,58	0,01	0,28	0,51	0,01	7,85

Número da amostra	Fe %	FeO %	SiO2 %	Al2O3 %	P %	Mn %	TiO2 %	CaO %	MgO %	K2O %	Na2O %	PPC %
FS-10-AM-01	58,00	3,54	5,53	6,11	0,046	0,15	0,34	< 0,01	0,05	0,03	< 0,01	5,30
FS-10-AM-02	50,06	< 0,01	14,19	4,85	0,030	0,62	0,23	< 0,01	0,21	< 0,01	< 0,01	8,53
FS-10-AM-03	46,97	< 0,01	16,75	4,23	0,031	1,42	0,20	< 0,01	0,22	0,04	< 0,01	8,43
FS-10-AM-04	45,58	< 0,01	20,18	4,16	0,064	1,37	0,21	< 0,01	0,17	0,02	0,01	8,53
FS-10-AM-05	45,75	< 0,01	19,95	3,88	0,071	1,23	0,21	< 0,01	0,15	0,01	< 0,01	8,99
FS-10-AM-06	45,20	< 0,01	19,92	3,63	0,066	1,36	0,24	< 0,01	0,14	0,01	< 0,01	9,73
FS-10-AM-07	43,91	< 0,01	22,27	3,66	0,070	1,08	0,23	< 0,01	0,22	0,01	< 0,01	9,22
FS-10-AM-08	39,72	0,14	27,16	3,27	0,044	2,34	0,23	0,27	0,24	0,04	< 0,01	7,28
FS-10-AM-09	46,74	1,00	28,44	1,11	0,014	1,10	0,06	0,01	0,06	0,02	< 0,01	1,27
FS-10-AM-10	36,37	0,28	42,78	0,74	0,009	1,76	0,01	0,01	0,03	0,01	< 0,01	1,12
FS-10-AM-11	49,28	0,14	25,45	0,83	0,010	1,44	0,03	0,01	0,03	0,02	< 0,01	0,86
FS-10-AM-12	36,74	0,15	40,38	1,49	0,016	1,82	0,04	0,02	0,04	0,01	< 0,01	1,61
FS-10-AM-13	30,63	0,14	43,13	3,28	0,034	2,41	0,20	0,02	0,11	< 0,01	< 0,01	4,45
FS-10-AM-14	36,02	0,07	33,61	2,96	0,055	2,39	0,21	0,03	0,24	< 0,01	< 0,01	6,93
FS-10-AM-15	32,16	0,07	40,80	4,39	0,033	1,86	0,33	0,02	0,13	0,04	< 0,01	5,39
FS-10-AM-16	40,10	0,14	33,72	3,07	0,024	1,81	0,13	0,02	0,07	0,05	< 0,01	2,79
FS-10-AM-17	41,07	0,85	34,32	3,01	0,022	0,82	0,18	0,01	0,06	0,05	< 0,01	2,42
FS-10-AM-18	32,33	0,22	27,44	10,71	0,100	3,05	1,14	0,03	0,34	1,06	0,01	7,75
FS-11-AM-01	35,05	3,03	23,50	14,44	0,061	0,05	1,08	0,14	0,10	0,20	0,02	9,95
FS-11-AM-02	31,07	0,42	23,82	19,21	0,055	0,08	1,31	< 0,01	0,11	0,32	0,01	9,87
FS-11-AM-03	27,19	0,24	26,39	21,16	0,057	0,06	1,45	< 0,01	0,10	0,28	< 0,01	10,73
FS-11-AM-04	54,44	6,00	18,42	1,86	0,032	0,06	0,08	< 0,01	0,09	0,01	< 0,01	1,39
FS-11-AM-05	43,14	< 0,01	25,27	3,67	0,074	1,08	0,22	< 0,01	0,16	0,01	0,02	7,27
FS-11-AM-06	41,75	0,14	28,43	2,99	0,066	1,07	0,19	< 0,01	0,14	< 0,01	< 0,01	6,60
FS-11-AM-07	40,30	0,07	27,63	3,18	0,069	1,98	0,21	< 0,01	0,14	< 0,01	< 0,01	7,12
FS-11-AM-08	37,64	< 0,01	31,79	2,63	0,063	2,44	0,18	< 0,01	0,16	0,01	< 0,01	7,14
FS-11-AM-09	39,46	< 0,01	27,80	3,28	0,102	2,45	0,23	< 0,01	0,17	0,02	< 0,01	7,83
FS-11-AM-10	35,88	< 0,01	34,38	2,58	0,085	2,41	0,20	< 0,01	0,13	0,02	0,01	7,80

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Número da amostra	Fe %	FeO %	SiO2 %	Al2O3 %	P %	Mn %	TiO2 %	CaO %	MgO %	K2O %	Na2O %	PPC %
FS-12-AM-01	57,28	1,32	4,15	6,70	0,075	0,05	0,57	< 0,01	0,03	0,02	< 0,01	6,46
FS-12-AM-02	23,55	0,12	27,39	24,39	0,060	0,07	1,40	< 0,01	0,07	0,25	< 0,01	11,74
FS-12-AM-03	23,66	0,12	28,12	24,37	0,059	0,07	1,43	< 0,01	0,06	0,26	< 0,01	11,70
FS-12-AM-04	29,14	0,13	23,89	21,01	0,071	0,05	1,29	< 0,01	0,04	0,16	< 0,01	11,50
FS-12-AM-05	33,24	0,12	20,22	18,45	0,083	0,06	1,23	< 0,01	0,05	0,07	< 0,01	11,44
FS-12-AM-06	34,90	0,06	20,32	17,62	0,079	0,05	1,27	< 0,01	0,04	0,06	< 0,01	11,01
FS-12-AM-07	34,02	< 0,01	22,03	16,62	0,070	0,05	1,21	< 0,01	0,03	0,06	< 0,01	10,59
FS-12-AM-08	35,67	0,15	22,84	14,77	0,073	0,07	1,09	< 0,01	0,05	0,05	0,02	10,03
FS-12-AM-09	34,62	0,15	26,92	12,21	0,073	0,05	0,96	0,02	0,04	0,04	< 0,01	9,26
FS-12-AM-10	34,32	0,15	28,58	11,54	0,069	0,06	0,97	< 0,01	0,04	0,04	< 0,01	8,71
FS-12-AM-11	33,80	0,15	34,72	8,27	0,060	0,09	0,80	< 0,01	0,03	0,05	< 0,01	7,10
FS-12-AM-12	34,89	0,15	35,88	6,92	0,064	0,10	0,67	0,01	0,04	0,04	< 0,01	6,14
FS-12-AM-13	39,56	0,23	36,74	3,17	0,040	0,08	0,32	0,02	0,02	0,01	0,01	2,57
FS-13-AM-01	59,30	0,70	2,47	3,62	0,073	0,04	0,16	0,04	0,09	< 0,01	< 0,01	9,31
FS-13-AM-02	61,80	0,13	1,27	2,17	0,046	0,05	0,10	< 0,01	0,13	< 0,01	< 0,01	7,84
FS-13-AM-03	56,72	0,13	5,19	2,33	0,051	0,27	0,10	< 0,01	0,20	< 0,01	< 0,01	10,78
FS-13-AM-04	31,77	0,43	48,03	1,37	0,035	0,66	0,08	< 0,01	0,06	0,02	< 0,01	3,58
FS-13-AM-05	32,39	< 0,01	45,39	1,54	0,033	2,01	0,10	< 0,01	0,06	0,02	0,01	4,35
FS-13-AM-06	30,55	< 0,01	40,87	3,43	0,055	2,92	0,25	< 0,01	0,12	0,02	0,01	7,27
FS-13-AM-07	49,62	< 0,01	7,61	8,56	0,039	0,03	0,32	< 0,01	0,15	< 0,01	< 0,01	12,24
FS-13-AM-08	57,55	< 0,01	2,91	2,89	0,045	0,07	0,12	< 0,01	0,17	0,01	< 0,01	11,73
FS-13-AM-09	57,92	< 0,01	2,94	3,67	0,038	0,17	0,14	< 0,01	0,13	< 0,01	< 0,01	9,98
FS-13-AM-10	52,03	0,06	10,25	4,17	0,035	0,16	0,15	< 0,01	0,06	< 0,01	< 0,01	10,41
FS-13-AM-11	49,27	0,07	14,16	4,21	0,082	0,17	0,16	< 0,01	0,07	< 0,01	< 0,01	9,65
FS-13-AM-12	45,66	< 0,01	22,12	4,26	0,055	0,20	0,13	< 0,01	0,11	< 0,01	< 0,01	6,83
FS-13-AM-13	52,85	0,13	12,51	3,64	0,075	0,26	0,11	< 0,01	0,10	< 0,01	< 0,01	8,13
FS-13-AM-14	47,02	0,46	21,81	3,54	0,044	0,24	0,11	< 0,01	0,08	0,01	< 0,01	6,86
FS-13-AM-15	33,25	0,98	45,90	2,06	0,037	0,18	0,10	< 0,01	0,03	< 0,01	< 0,01	4,13

Número da amostra	Fe %	FeO %	SiO2 %	Al2O3 %	P %	Mn %	TiO2 %	CaO %	MgO %	K2O %	Na2O %	PPC %
FS-14-AM-01	53,00	1,09	14,93	1,05	0,050	0,17	0,04	0,05	0,19	< 0,01	0,02	7,61
FS-14-AM-02	40,89	0,40	34,46	0,61	0,041	0,07	0,22	< 0,01	0,11	< 0,01	< 0,01	6,51
FS-14-AM-03	30,51	0,25	49,76	0,78	0,032	0,05	0,05	< 0,01	0,05	< 0,01	< 0,01	5,74
FS-14-AM-04	33,60	0,07	43,88	0,90	0,036	0,10	0,04	< 0,01	0,10	< 0,01	< 0,01	6,85
FS-14-AM-05	24,62	0,13	58,80	0,61	0,029	0,10	0,02	< 0,01	0,03	< 0,01	< 0,01	4,55
FS-14-AM-06	42,01	0,40	32,04	1,88	0,042	0,13	0,09	< 0,01	0,11	< 0,01	0,02	6,72
FS-14-AM-07	44,30	0,27	22,46	4,85	0,045	0,14	0,23	< 0,01	0,17	< 0,01	< 0,01	9,97
FS-14-AM-08	31,39	< 0,01	45,05	2,41	0,036	0,80	0,13	< 0,01	0,08	0,02	0,02	6,82
FS-14-AM-09	34,46	0,46	39,33	3,18	0,042	0,61	0,19	< 0,01	0,23	0,02	< 0,01	6,81
FS-14-AM-10	30,93	< 0,01	45,56	1,65	0,030	1,80	0,10	< 0,01	0,33	0,02	< 0,01	4,94
FS-14-AM-11	28,05	1,44	52,79	0,93	0,024	0,95	0,05	< 0,01	1,41	0,02	< 0,01	3,14
FS-15-AM-01	38,16	0,92	22,07	11,79	0,100	0,10	2,28	0,05	0,05	0,03	< 0,01	8,37
FS-16-AM-01	57,09	< 0,01	5,22	7,67	0,083	0,02	0,51	0,01	0,04	0,04	< 0,01	4,65
FS-16-AM-02	33,41	< 0,01	20,39	19,26	0,053	0,03	1,07	< 0,01	0,02	0,20	< 0,01	11,09
FS-16-AM-03	37,34	0,13	18,33	16,68	0,072	0,05	1,10	< 0,01	0,04	0,09	< 0,01	10,15
FS-16-AM-04	45,01	0,13	15,06	10,78	0,049	0,06	1,42	< 0,01	0,03	0,01	< 0,01	7,90
FS-16-AM-05	25,80	0,26	26,91	22,12	0,048	0,05	3,55	< 0,01	0,02	0,01	< 0,01	10,70
FS-16-AM-06	20,56	1,03	29,30	24,13	0,071	0,08	5,05	< 0,01	< 0,01	0,01	< 0,01	11,55
FS-16-AM-07	20,10	1,06	29,97	25,04	0,050	0,09	4,71	< 0,01	< 0,01	0,02	< 0,01	11,96
FS-17-AM-01	53,06	1,49	18,27	2,88	0,025	0,18	0,14	< 0,01	< 0,01	0,01	< 0,01	2,57
FS-18-AM-01	60,22	3,70	4,11	0,05	0,090	0,16	0,10	0,09	0,04	0,02	< 0,01	5,51
FS-18-AM-02	55,46	4,10	4,44	0,03	1,890	0,24	0,03	0,20	0,06	0,03	< 0,01	8,94
FS-18-AM-03	55,09	2,75	4,98	0,05	1,910	0,28	0,02	0,18	0,03	0,02	< 0,01	9,91
FS-18-AM-04	53,30	3,13	5,82	0,04	2,910	0,28	0,02	0,13	0,05	0,01	< 0,01	9,83
FS-18-AM-05	48,44	11,91	6,15	0,06	2,070	0,32	0,03	0,20	0,05	0,04	0,01	9,06
FS-18-AM-06	49,90	22,10	2,70	0,03	0,430	0,13	0,02	0,03	0,01	0,02	< 0,01	2,68
FS-18-AM-07	33,36	23,46	9,26	0,27	4,350	0,73	0,06	0,48	0,88	0,09	< 0,01	10,41

Número da amostra	Fe %	FeO %	SiO2 %	Al2O3 %	P %	Mn %	TiO2 %	CaO %	MgO %	K2O %	Na2O %	PPC %
FS-19-AM-01	43,48	19,49	8,93	0,066	0,54	1,38	0,03	0,07	0,04	0,05	< 0,01	6,78
FS-19-AM-02	38,89	29,5	3,58	0,058	2,06	0,27	0,03	0,2	0,03	0,04	< 0,01	7,36
FS-19-AM-03	37,46	33,53	2,76	0,054	1,98	0,2	0,02	0,21	0,01	0,05	< 0,01	7,08
FS-19-AM-04	38,56	30,57	3,13	0,09	2	0,2	0,03	0,2	0,01	0,04	< 0,01	7,67
FS-19-AM-05	52,75	7,39	6,05	0,23	1,32	0,27	0,02	0,43	< 0,01	0,02	< 0,01	7,81
FS-19-AM-06	41,01	15,68	10,84	0,069	2,8	0,22	0,02	2,28	0,01	0,03	< 0,01	8,09
FS-19-AM-07	26,67	33,15	8,82	0,037	1,56	0,14	0,02	10,59	0,01	0,02	< 0,01	7,35
FS-19-AM-08	18,67	42,3	6,98	0,018	0,93	0,09	0,02	15,77	< 0,01	0,02	< 0,01	6,8
FS-19-AM-09	19,34	45	2,72	0,012	1,1	0,11	0,02	18,65	0,01	0,06	< 0,01	4,79
FS-19-AM-10	19,08	45,32	2,36	0,021	1,16	0,1	0,02	19,18	0,01	0,04	< 0,01	4,45
FS-19-AM-11	17,63	45,85	4,23	0,017	0,98	0,09	0,02	18,63	< 0.01	0,02	< 0,01	5,12
FS-19-AM-12	17,14	47,88	1,27	0,015	1,03	0,09	0,02	21,32	< 0.01	0,06	< 0,01	3,97
FS-19-AM-13	17,47	47,35	1,23	0,016	1,02	0,1	0,02	20,68	< 0.01	0,05	< 0,01	3,87
FS-19-AM-14	51,57	16,77	3,08	0,05	0,34	0,05	0,23	3,02	0,01	0,02	< 0,01	2,68
FS-20-AM-01	36,48	18,39	17,84	0,05	0,02	1,03	0,02	0,12	0,24	0,03	< 0,01	10,14
FS-20-AM-02	31,99	25,51	17,8	0,053	0,02	0,96	0,01	0,11	0,3	0,06	< 0,01	9,77
FS-20-AM-03	28,82	33,06	15,77	0,048	0,02	0,93	0,01	0,09	0,29	0,05	< 0,01	8,48
FS-20-AM-04	42,31	18,48	11,55	0,062	0,03	0,66	0,02	0,14	0,16	0,02	< 0,01	8,33
FS-20-AM-05	50,79	15,76	5,14	0,035	0,15	0,44	0,02	0,13	0,01	0,02	< 0,01	6,62
FS-20-AM-06	12,73	64,19	6,14	0,111	1,89	0,84	0,14	1,1	0,14	0,11	< 0,01	5,93
FS-20-AM-07	16,11	59,05	5,74	0,188	2,76	0,68	0,07	0,32	0,15	0,11	< 0,01	6,25
FS-21-AM-01	8,70	73,49	6,00	0,086	1,48	0,78	0,04	0,12	0,19	0,11	< 0,01	4,44
FS-21-AM-02	9,83	74,10	3,74	0,063	1,93	0,58	0,05	0,13	0,18	0,10	< 0,01	4,19

10 – ESTIMATE OF MINERAL POTENTIAL

To calculate the iron ore reserve existing in the concession area were used ten vertical geological sections interpreted from the geologic map and twenty-eight rotary drilling holes made in the area.

In each section was determined the itabirites occurrence area of the Cauê formation, Gandarela formation besides the colluvium (rolled ore) that occur in the area, considering this calculation only the ore with a Fe content above 35%.

The ore volume was determined multiplying the area calculated in each section by the influence distance of each section. This influence distance was generally regarded as the sum of semi-distances between a given section and its adjacent sections. Tonnage blocked by each section was determined multiplying the volume found by the density of each mineral considered.

The following tables illustrate the measured reserves calculated as described above:

Table 3 – Rolled Ore Reverse (colluvium)

SEÇÃO	ÁREA	DIST	VOL	d	TONELAGEM
590700	847,87	155,43	131.784,43	3	395.353,30
590800	2.871,91	100	287.191,00	3	861.573,00
590900	3.878,38	100	387.838,00	3	1.163.514,00
591000	4.534,09	100	453.409,00	3	1.360.227,00
591096	7.992,66	100	799.266,00	3	2.397.798,00
591196	4.982,99	100	498.299,00	3	1.494.897,00
591296	3.689,64	100	368.964,00	3	1.106.892,00
591396	1.296,57	100	129.657,00	3	388.971,00
591496	462,06	100	46.206,00	3	138.618,00
591596	0,00				
Total			1.842.392,00		9.307.843,30

Table 5 – Lateritic Ore Reserves

SEÇÃO	ÁREA	DIST	VOL	d	TONELAGEM
590700	0,00	155,43	0,00	3	0,00
590800	0,00	100	0,00	3	0,00
590900	0,00	100	0,00	3	0,00
591000	1.287,11	100	128.711,00	3	386.133,00
591096	2.628,92	100	262.892,00	3	788.676,00
591196	5.731,23	100	573.123,00	3	1.719.369,00
591296	16.871,66	100	1.687.166,00	3	5.061.498,00
591396	0,00	100	0,00	3	0,00
591496	0,00	100	0,00	3	0,00
591596	0,00				
Total			2.523.181,00		7.955.676,00

Table 4 – Silica Itabirite Reserve (Cauê Formation)

SEÇÃO	ÁREA	DIST	VOL	d	TONELAGEM
590700	0,00	155,43	0,00	2,5	0,00
590800	0,00	100	0,00	2,5	0,00
590900	0,00	100	0,00	2,5	0,00
591000	0,00	100	0,00	2,5	0,00
591096	6.720,23	132	887.070,36	2,5	2.217.675,90
591196	7.855,73	100	785.573,00	2,5	1.963.932,50
591296	8.262,92	100	826.292,00	2,5	2.065.730,00
591396	9.162,42	100	916.242,00	2,5	2.290.605,00
591496	3.868,33	100	386.833,00	2,5	967.082,50
591596	5.221,58	83,5	436.001,93	2,5	1.090.004,83
Total			**4.238.012,29**		**10.595.030,73**

Table 5 – Carbonate Itabirite Reserve (Gandarela Formation)

SEÇÃO	ÁREA	DIST	VOL	d	TONELAGEM
590700	0,00	155,43	0,00	2,5	0,00
590800	4.436,00	100	443.600,00	2,5	1.109.000,00
590900	6.833,60	100	683.360,00	2,5	1.708.400,00
591000	9.315,89	100	931.589,00	2,5	2.328.972,50
591096	10.432,78	100	1.043.278,00	2,5	2.608.195,00
591196	21.601,45	100	2.160.145,00	2,5	5.400.362,50
591296	10.058,62	100	1.005.862,00	2,5	2.514.655,00
591396	9.075,28	100	907.528,00	2,5	2.268.820,00
591496	2.186,24	100	218.624,00	2,5	546.560,00
591596					
	Total		5.335.437,00		18.484.965,00

TOTAL GERAL	46.343.515,03

11. ORE QUALITY

The ore quality was determined in each section by the weighted average of the contents found in the sample of each hole, considering the sample length considered in the calculus.

The results for each ore type per geological section are listed in the following tables:

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Table 6 - Average Quality of Waste Ore (Rolled and Laterite)

SEÇÃO	FUROS	COMP.	Fe	SiO2	Al_2O_3	P	Mn	PPC
590700	FS-25	21,3	49,67	22,19	1,78	0,07	0,07	4,22
	MÉDIA	**21,3**	**49,67**	**22,19**	**1,78**	**0,07**	**0,07**	**4,22**
590800	FS-24	27,9	31,08	50,88	2,49	0,03	0,13	2,12
	FS-26	10,10	31,58	29,47	14,21	0,055	0,27	8,02
	MÉDIA	**38,00**	**31,21**	**45,19**	**5,61**	**0,04**	**0,17**	**3,69**
590900								
	FS- 19	4,30	43,48	19,49	8,93	0,066	0,54	6,78
	FS-22							
	FS-23	31,70	44,22	24,33	5,78	0,059	0,06	5,62
	MÉDIA	**36,00**	**44,14**	**23,75**	**6,16**	**0,059**	**0,11**	**5,76**
591000	FS- 16	23,85	42,18	15,39	14,12	0,063	0,04	8,73
	FS- 17	4,80	53,06	18,27	2,88	0,025	0,18	2,57
	FS-18	2,20	60,22	3,70	4,11	0,047	0,09	5,51
	FS-20/21	11,70	39,47	18,44	14,61	0,056	0,03	9,21
	MÉDIA	**42,55**	**43,60**	**15,95**	**12,47**	**0,056**	**0,05**	**8,00**
591096	FS- 05	17,70	47,78	10,89	11,37	0,069	0,05	8,48
	FS- 06	31,55	51,12	10,85	8,12	0,05	0,14	6,64
	FS-09	43,45	48,88	13,41	5,80	0,04	0,90	8,89
	FS-27	9,15	37,08	33,80	5,79	0,059	0,13	5,11
	MÉDIA	**101,85**	**48,32**	**14,01**	**7,49**	**0,050**	**0,45**	**7,78**
591196	FS- 07	65,30	40,17	15,87	15,10	0,092	0,04	10,01
	FS- 10	5,85	58,00	5,53	6,11	0,046	0,15	5,30
	FS- 13	11,55	60,46	1,91	2,95	0,060	0,04	8,63
	FS- 15	5,90	38,16	22,07	11,79	0,1	0,1	8,37
	MÉDIA	**88,60**	**43,86**	**13,78**	**12,70**	**0,085**	**0,05**	**9,41**
591296	FS- 11	3,30	35,05	23,50	14,44	0,061	0,05	9,95
	FS- 12	75,56	37,50	24,25	10,83	0,067	0,07	8,02
	FS-14	2,10	53,00	14,93	1,05	0,050	0,17	7,61
	FS-28	51,00	45,69	21,31	4,54	0,04	0,25	8,34
	MÉDIA	**131,96**	**40,85**	**22,95**	**8,33**	**0,06**	**0,14**	**8,19**
MÉDIA GERAL			**43,21**	**20,42**	**8,67**	**0,06**	**0,18**	**7,57**

Table 7 - Average Quality of Itabiritic Ore (Cauê and Gandarela Formation)

SEÇÃO	FUROS	COMP.	Fe	SiO2	Al_2O_3	P	Mn	PPC
590700	FS-25							
	MÉDIA							
590800	FS-24	5,40	35,56	45,72	0,82	0,033	0,04	2,84
	FS-26	16,55	41,52	33,79	1,19	0,06	0,68	2,45
	MÉDIA	**21,95**	**40,06**	**36,73**	**1,10**	**0,06**	**0,52**	**2,54**
590900	FS-19	34,75	42,23	22,84	5,16	0,106	1,98	7,59
	FS-22	30,65	45,32	23,24	3,10	0,082	1,21	3,64
	FS-23							
	MÉDIA	**65,40**	**43,68**	**23,03**	**4,19**	**0,09**	**1,62**	**5,74**
591000	FS-16							
	FS-17							
	FS-18	32,25	52,96	7,09	4,99	0,043	1,97	8,68
	FS-20/21	7,55	50,79	15,76	5,14	0,035	0,15	6,62
	MÉDIA	**39,80**	**52,55**	**8,74**	**5,02**	**0,04**	**1,62**	**8,29**
591096	FS-05	3,75	46,09	20,35	5,73	0,039	0,44	7,11
	FS-06							
	FS-09	33,55	49,96	13,44	4,03	0,060	2,10	7,22
	FS-27							
	MÉDIA	**37,30**	**49,57**	**14,13**	**4,20**	**0,06**	**1,93**	**7,21**
591196	FS-07							
	FS-10	108,20	43,09	26,46	3,08	0,040	1,49	5,99
	FS-13	61,35	51,95	11,13	4,19	0,051	0,17	9,64
	FS-15							
	MÉDIA	**169,55**	**46,30**	**20,91**	**3,48**	**0,044**	**1,01**	**7,31**
591296	FS-04	56,65	41,90	36,63	0,33	0,031	0,02	2,53
	FS-11	51,70	40,79	28,49	2,95	0,074	1,77	6,84
	FS-12							
	FS-14	21,65	42,68	28,60	2,80	0,04	0,12	8,06
	FS-28							
	MÉDIA	**130,00**	**41,59**	**27,29**	**1,32**	**0,04**	**0,72**	**3,82**
591496	FS-02	35,60	42,91	31,77	0,94	0,064	0,18	5,40
	FS-03	25,45	43,35	33,81	0,46	0,031	0,06	3,30
	MÉDIA	**61,05**	**43,10**	**32,62**	**0,74**	**0,05**	**0,13**	**4,52**
591596	FS-01	54,50	41,40	35,08	0,52	0,04	0,19	4,29
	MÉDIA	**54,50**	**41,40**	**35,08**	**0,52**	**0,036**	**0,19**	**4,29**
MÉDIA GERAL			**44,55**	**24,47**	**2,57**	**0,05**	**0,93**	**5,65**

12. Conclusions

The technical data obtained from the geological exploration indicate that this is a reserve of iron ore formed by supergene enrichment of the itabirites Cauê and Gandarela formations, in addition a waste ore reserve located in the central part of the concession.

The work conducted so far has blocked a reserve more than 50 million tons with Fe content above 44% as shown in the following tables:

Table 8 – Waste Ore (Rolled and Laterite)

SEÇÃO	TONELAGEM	Fe	SiO2	Al_2O_3	P	Mn	PPC
590700	395.353,30	49,67	22,19	1,78	0,067	0,07	4,22
590800	861.573,00	31,21	45,19	5,61	0,036	0,17	3,69
590900	1.163.514,00	44,14	23,75	6,16	0,059	0,11	5,76
591000	1.746.360,00	43,60	15,95	12,47	0,056	0,05	8,00
591096	3.186.474,00	48,32	14,01	7,49	0,050	0,45	7,78
591196	3.214.266,00	43,86	13,78	12,70	0,085	0,05	9,41
591296	6.168.390,00	40,85	22,95	8,33	0,057	0,14	8,19
591396	388.971,00						
591496	138.618,00						
591596							
Média	**17.263.519,30**	**43,08**	**19,94**	**9,00**	**0,060**	**0,17**	**7,83**

Table 9 – Itabiritic Ore (Cauê e Gandarela Formation)

SEÇÃO	TONELAGEM	Fe	SiO2	Al_2O_3	P	Mn	PPC
590800	1.109.000,00	40,06	36,73	1,10	0,06	0,52	2,54
590900	1.708.400,00	43,68	23,03	4,19	0,095	1,62	5,74
591000	2.328.972,50	52,55	8,74	5,02	0,042	1,62	8,29
591096	4.825.870,90	49,57	14,13	4,20	0,058	1,93	7,21
591196	7.364.295,00	46,30	20,91	3,48	0,044	1,01	7,31
591296	4.580.385,00	41,59	27,29	1,32	0,043	0,72	3,82
591396	4.559.425,00						
591496	1.513.642,50	43,10	32,62	0,74	0,050	0,13	4,52
591596	1.090.004,83	41,40	35,08	0,52	0,036	0,19	4,29
Média	**29.079.995,73**	**45,77**	**21,83**	**3,01**	**0,050**	**1,13**	**6,10**

Reserva Global	**46.343.515,03**	**44,77**	**21,12**	**5,24**	**0,054**	**0,77**	**6,75**

13 – COSTS

13.1 – MINE WORK AND PROCESSING

The cost with the mine work of iron ore for monthly production estimate in 250.000 tons and its respective processing are presented as follow:

13.1.1. – Production Data (Monthly Estimates)

					Production rate	
Mines' extraction	9	h/day	26	day/month	**1068**	**t/hour**
Processing	9	h/day	26	day/month	**855**	**t/hour**

Monthly Production of the Extracted Ore = 250.000 tons

Monthly Production of the Processed Ore = 200.000 tons

Note: Considering a recovery of 80% in the process.

Considering the relation sterile/ore = 2/1

13.1.2 Cost of the Mine work (Monthly Estimates)

Cut and ROM Load (R$1,00/t) = R$ 250.000,00

ROM Transport = R$ 200.000,00

Drilling and Dismounting = R$ 250.000,00

Road Maintenance = R$ 100.000,00

Sterile Transport (R$0,50/t) = R$ 250.000,00

Cut and Load of Sterile (R$0,50/t) = R$ 250.000,00

General Expenses = R$ 87.500,00

Unit Cost = R$ 5,55 / ton (US$ 3.00)

MONTHLY TOTAL (USD) = US$ 750,000.00

13.1.3 – Cost of the Processing (Monthly Estimates)

Material/Maintenance = R$300.000,00

Crusher Feeding = R$150.000,00

Electric Energy = R$ 150.000,00

General Expenses = R$ 100.000,00

Quality Control = R$40.000,00

Unit Cost = R$ 3,70 (US$ 2.00) / ton of product

MONTHLY TOTAL (USD) = US$ 400,000.00

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MINE EXPLORATION

13.2 – ROAD TRANSPORT

The considered road transport is in relation to the distance between the area and the terminal of Sarzedo-MG. The estimative base is about R$ 0,1875/km/ton of sinter in dump trucks of 30 tons.

Mine-terminal distance: 9km

Unit Cost = R$ R$ 1,69 (US$ 0.91) / ton

MONTHLY TOTAL (USD) = US$ 182,432.43

13.3 – STORAGE AND LOADING – LOAD TERMINAL

The whole receiving, weighing, handling, storage, transshipment and loading, besides the whole relative documentation to these operations, will be making in the Load Terminal of Sarzedo. So for a monthly estimate, we have:

Unit Cost = R$ 10,17 (US$ 5.50) / ton

MONTHLY TOTAL (USD) = US$ 1,100,000.00

13.4 – RAILROAD TRANSPORT

The railroad transport will be making by the iron train of the MRS Logistic up to the destination port.

Unit Cost = R$ 37,00 (US$ 20.00) / ton

MONTHLY TOTAL (USD) = US$ 4,000,000.00

13.5 – PORT

The port costs involve unloading, stockade and loading in ships. The estimated average cost for ports in Rio de Janeiro is about R$27,75/ton of sinter-feed ore.

Unit Cost = R$ 27,75 (US$ 15.00) / ton

MONTHLY TOTAL (USD) = US$3,000,000.00

14 – ECONOMIC POTENTIAL OF THE COMPANY

Verifying the exploration positive result according to the accomplished estimates, the company will make possible the commercialization of the ore FOB (Rio de Janeiro) to the monthly cost of **US$ 9,432,432.43** to 200 thousand commercialized tons. Considering an extra US$10.00/ton for additional costs, this give us a FOB cost of **US$57.16/ton.**

This represents a rude profit potential of **US$ 27.84/ ton** commercialized, equivalent of **49% of a profit over the total cost** of the productive chain.

Considering the preliminary estimative of 50 million tons, it is evaluated, with basis on the expected profitability and in a recovery of processing by 80%, that the company has a **NPV undiscounted in time and without consideration of CAPEX by US$ 1,392,000,000.00**.

Consideration: Exchange: US$1.00 = R$1,85 and sale's value of the ore US$ 85.00)