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 Pentecoste 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

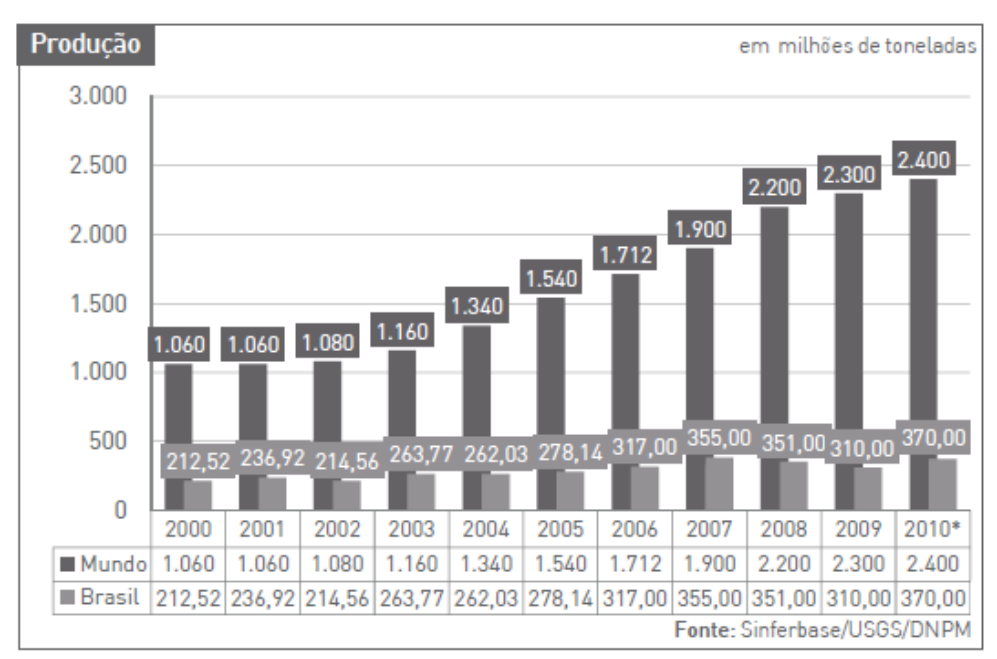
Brazil stands out worldwide as one of the main producers of the minerals goods.

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. Its production in 2010 is estimated at 370 million tones, equivalent to 16% of the world (2.3 billion tons).

The main producing states in 2010 are: MG (67%), PA (29.3%) and others (3.7%).



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010*
Mundo	1.060	1.060	1.080	1.160	1.340	1.540	1.712	1.900	2.200	2.300	2.400
Brasil	212,52	236,92	214,56	263,77	262,03	278,14	317,00	355,00	351,00	310,00	370,00

Fonte: Sinferbase/USGS/DNPM

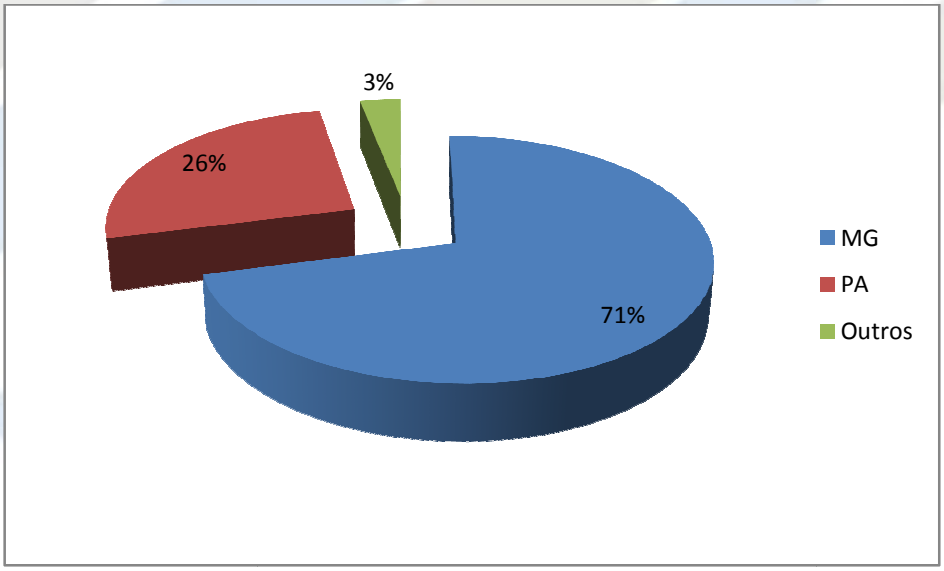
Adding the commercialized rude ore production to the production of the sector of mineral transformation, the mining of Brazil generated in 2008 US$ 42 billion, what represents 5.7% of the GDP. The positive scene reflects in the investments of the sector that are foreseen in US$ 62 billion between 2010 and 2014.

1.3.1 – ACTUAL SCENARIO OF IRON ORE IN BRAZIL

Brazilian iron ore resources (total measured, indicated and inferred) officially recognized by the National Department of Mineral Production DNPM are around 73.7 billion tons.

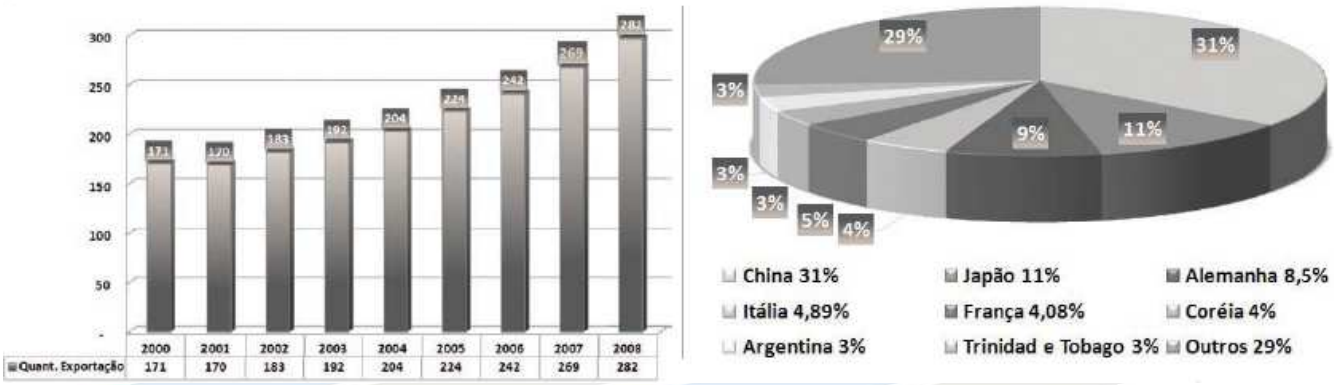
Considering the measured and indicated reserves Brazil has about 33.0 billion tons of ore, as follows: Minas Gerais - 71.0%, Pará - 26.0% and other states (Mato Grosso do Sul, Alagoas, Amazonas, Bahia, Ceará, Goiás, Pernambuco, Rio Grande do Norte and São Paulo) - 3%. The Brazilian reserves represent 8.9% of world reserves (370 million tons), putting Brazil in fifth place among the countries possessing larger quantities of ore.

However, considering the reserves in terms of iron contained in the ore, Brazil takes very important place in the international arena. This is due to the high content found in Hematite Ore (60% iron) predominant in Pará and Itabirite Ore (50% iron) predominant in Minas Gerais.



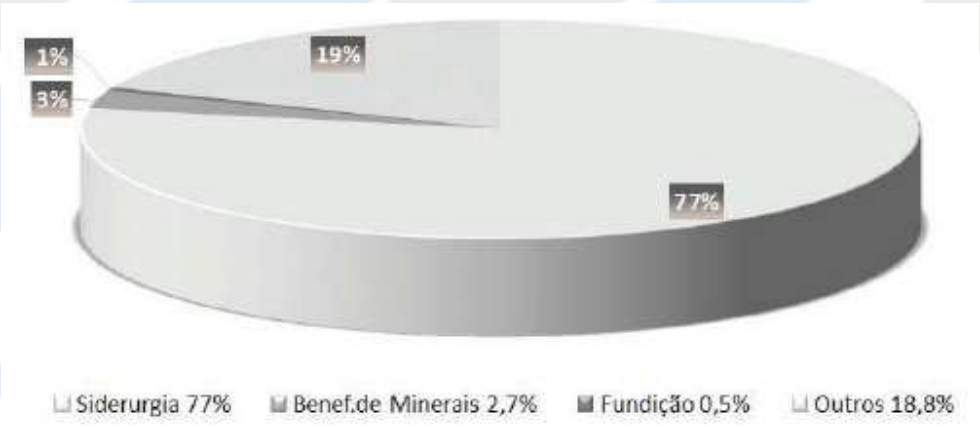
Graphic 1 - Distribution of Iron Ore Reserve in Brazil by States - 2008 - Source IBRAM

In 2008, Brazilian exports of primary iron goods reached 282 million tons, with an FOB value of U.S. $ 16.5 billion. The countries that most imported from Brazil were China (31%), Japan (11%), Germany (8.5%), Italy (5%), France (4%) and others (40.5%).



Graphic 2 – Iron Ore Exportation between 2000-2008 – Source IBRAM

Consumer market of iron ore is formed mainly by the steel industry.



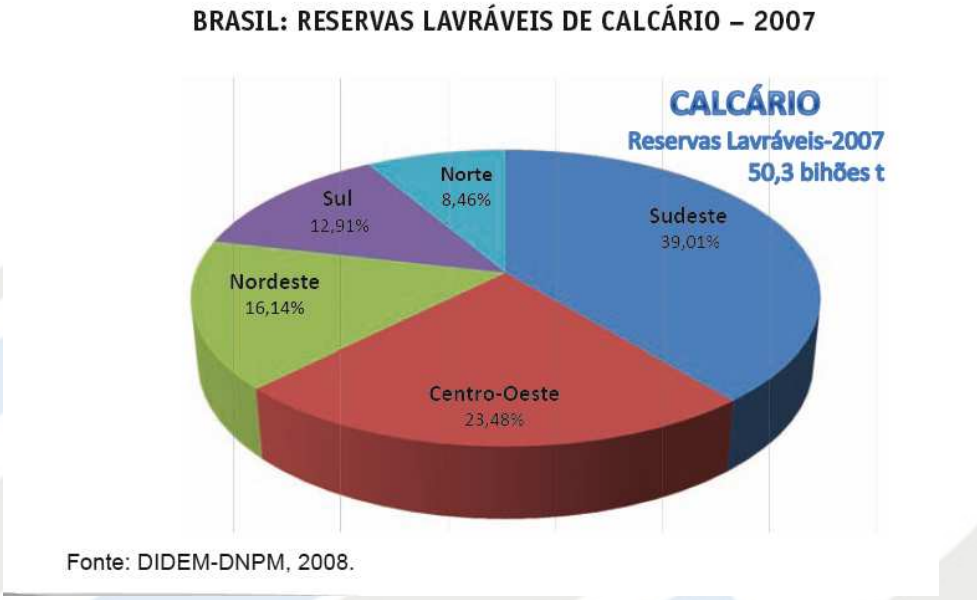
Graphic 3 - Consumer Market of Iron Ore – Source IBRAM

1.3.1 – ACTUAL SCENARIO OF CALCAREOUS ORE IN BRAZIL

Calcareous (limestone) derives from Latin *calcarius*, meaning "that contains salt". They are rocks that have dominance of calcium carbonate in the chemical composition, which the origin organic at prevalence is associated with fossil shells and skeletons of living organisms or by chemical precipitation. In the chemicalgene calcareous case, calcium carbonate dissolved in the water crystallizes and precipitates forming lenses and layers with thickness and continuity variables, especially in marine environments.

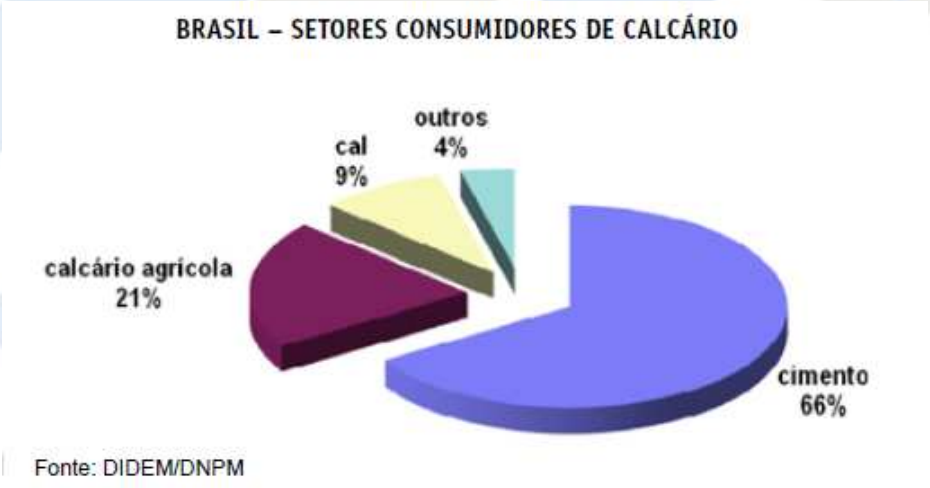
The most common outcrops in the crust are organic. The general classification of limestones, due to variations in the mineralogical composition of rocks, allows to distinguish them: limestone (calcite) and dolomite (magnesium, CaMg $(CO_3)_2$ or $CaCO_3$. $MgCO_3$). The main applications are: the production of lime in agriculture (soil pH correction), metallurgy (flux), in the glass industry, as ornamental rock, casing and gravel for building construction, and in the cement industry (Portland cement).

The primary availability of limestone - carbonate rocks composed mainly of the minerals calcite ($CaCO_3$) and dolomite ($CaCO_3MgCO_3$) - reach around 14 billion tons.



Graphic 1 – Distribution of Limestone Reserves by State

In 2008, Brazilian production of limestone was 114 million tons, and about 74 million tons went to the cement industry, 23 million tons to agricultural limestone production, 12 million tons for the production of lime and the remainder to other industry sectors, including production of gravel, as shows graphic 2.



Graphic 2 – Sectors Consumers of Limestone

Use of limestone for the Production of Lime

Lime or calcium oxide (CaO) is a product of calcination of limestone or dolomite. Lime is produced based on limestone with a high content of calcium or magnesium. Typically, lime with high calcium content has less than 5% MgO.

By calcination means transformation by heat of calcium carbonate ($CaCO_3$) in oxide (CaO), called ordinary lime, or any other metal in oxide, which, previously, gave the generic name of lime. In general, calcination occurs close to the material melting temperature, in the case of limestone, ranging from 900 to 1000°C (1652 to 1832°F).

The manufacturing of lime includes three steps: sample preparation, calcination and hydration. The preparation stage of limestone to feed the calcination kiln means mining operations, crushing plant, screening and sometimes washing, to obtain a final product with lower levels of impurities. Common procedures are adopted for removal of silica, alumina and iron oxides. The flowchart in Figure 1 illustrates in detail the operations of obtaining lime.

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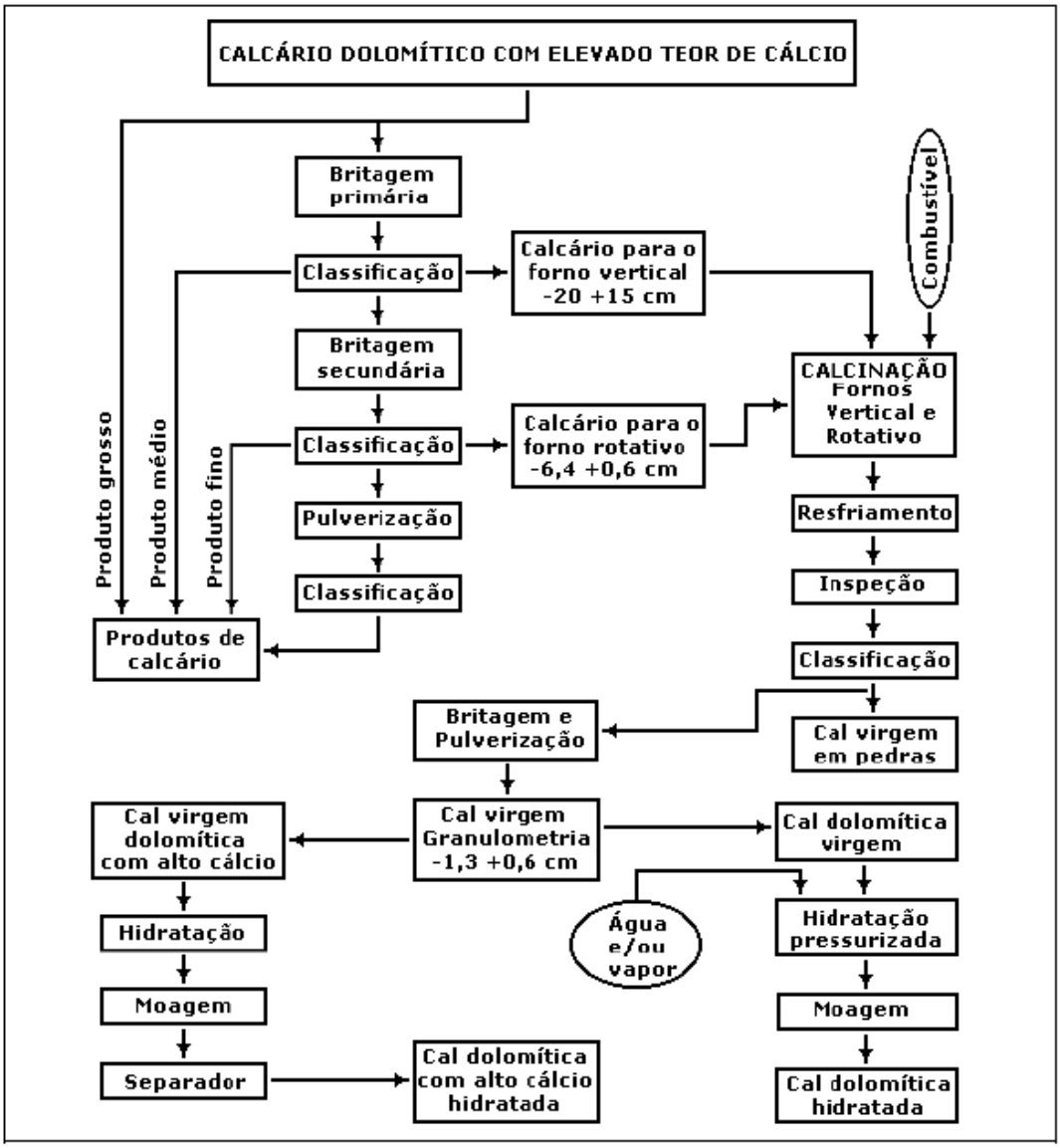

Figure 1 – Flowchart flowchart of the circuit to obtain lime based on calcium carbonate dolomite

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Use of Calcium Carbonate in the Metallurgical Industry

The calcium oxide reacts readily with impurities, among others, with those containing sulfur, according to the reaction:

$$CaO \text{ (from limestone)} + SO_3 \leftrightarrow CaSO_3 \text{ (slag)}$$

This type of reactions are important in high temperature pyrometallurgical processes in which the CaO produced by decomposition of $CaCO_3$ reacts with acidic impurities, for example, in kilns for pig iron manufacturing. There are several functions of lime in the steel industry, among others:

(i) scorify loading impurities, through the above mechanism;

(ii) reduce the loading melting temperature and the slag viscosity facilitating their drainage.

The calcite limestone used in the steel industry has a dual function: melting and fluxing. These limestones must contain at least 49% CaO, from 2 to 4% MgO and between 2 and 5% SiO2. The particle size should be between 20 and 49 mm. The loss on ignition should be around 40%.

Use of Limestone in Agriculture

The ground limestone and its products, quicklime and hydrated lime, slag, and others, are applied to the soil to correct acidity and promote plant growth.

Most of the limestone used for agricultural purposes in Brazil is based on the direct application of the product in the soil. Even so, products such as quicklime and hydrated lime, slag, among others, are used for correcting soil acidity, reaching a pH between 6 and 7, the range considered optimal to cultivate many plants. The limestone, mainly dolomite provides two important nutrients for the soil, calcium and magnesium, as well trace elements contained in the limestone. The limestone also neutralizes the acidity generated by nitrogen fertilizers, such as nitrate, ammonium and sulphate increasing the cultivation and organic content of soil.

The rate of application of lime in the soil (kg/m^2) depends on many factors, however the most usual is included in the range between 0.1 and 0.9 kg/m^2 of soil. The limestone specifications consist in controlling its concentration of CaO and particle size distribution. For pure limestone, they find higher concentrations of CaO in the range of particle size between 250 and 140 µm also higher performance of lime to the soil.

1.3.2 – Mining in Ceará

Ceara is a moment of rediscovery of its mining and export ore potential. The scenario is considered favorable because of the large number of small deposits of iron ore, good quality product, good logistics and the interest of the Chinese market.

The number of exploration requests of iron ore in Ceara has grown 374% in just over two years. There were 150 areas requested in 2008, compared to 711 areas required until February of this year.

The exploration requests for iron ore in Ceará became intense in 2004, when areas were targeted in the municipalities of Sobral and Coreaú Frecheirinha - upstate.

The largest number of areas is with the application or exploration license for the mining companies Vtech Mineral Developments and Terrativa Mineral, in addition to the VALE and two individuals from Sao Paulo: Ingo Gustav Wender and Angelito Ancelmo Santana.

Figure 2 – Iron Ore in Pecém Port - CE

IN CEARÁ

REQUESTS. Currently, there are Ceará: 370 explorations requests in the municipalities of Viçosa do Ceará, Camocim, Morada Nova, Russas, Quixadá, Ibaretama, Ibicuitinga, Quixeramobim, Banabuiú, Boa Viagem, Santa Quitéria, Catunda; 245 authorizations of exploration & warrants – in Granja, Uruoca, Senador Sá, Quixeramobim, Quixadá, Crateús, Catunda, Santa Quitéria, Novo Oriente, Independência, Sobral, Quiterianópolis, Lavras da Mangabeira e Aurora, also 93 areas available for exploration.

MANGANESE. There are 104 cases for areas of manganese ore in Ceará, with 59 explorations requests, 44 authorizations of exploration and 1 mining request in the municipality of Ocara. The requirements and authorizations are concentrated in the municipalities of Araçoiaba, Chorozinho, Ocara, Itapiúna, Morada Nova, Paramoti, Ibaretama, Quixadá. Piquet Carneiro, Canindé, Tejuçuoca, General Sampaio, Palmácia e Redenção. The Companies with largest number of cases are: Carbopar, from Carbomil Group e Ferroatlântica Mining, from the state of Minas Gerais.

NUMBERS.

711 Exploration Requests of iron ore in Ceara ocurred since 2004.

300 thousand tons of iron ore is the intention of GLOBEST for Ceara's exportation in 2010

2.5 million tons of iron ore deposit is esteemed by DNPM for GLOESTER's mine.

Source – IBRAM

1.3.3 – Local and Regional Geology

In preparation for the areas requests, was made an identification as to the geological partitioning of direct influence area, including predominantly represented lithologies of the Precambrian.

The area is inserted in the fields of the Trinity Complex, which shows great lithological diversity, with heavily migmatized areas essentially and gneissic areas, with occurrences of calcite and crystalline limestone.

To this complex, was placed as a stratigraphic position in the Inferior Precambrian, correlating it to the Caicó Complex. Radiometric determinations made in this complex, show a position in the Pre-Cambrian low to medium, in view of the Brasiliano event participation in this complex. Their contacts with the Northeastern Complex are mostly due to failures and largely in contact with Cachoeirinha and Salgueiros Groups.

The gneisses represent the most widespread lithology in the unit, where the types biotite-quartz-feldspar-gneiss, hornblende-quartz-feldspar gneiss, biotitegarnet gneiss and muscovite gneiss are most characteristic.

In the area, gneiss presents with gray color, with intercalations whitish and grain ranging from thin to medium. According to petrographic studies conducted in the area (Brazilian Radam Project), this complex, in depth, reveals a numbers of hetero-granoblastic, cataclasis, recrystallized, composed by grains of quartz and feldspar and subordinate, hornblende and biotite. The grain varies from fine to medium, with textures zenoblastics, granolepdoblastics, morter and granoblastic.

The crystalline limestone and calcite, occur in lenticular layers following the existing sigmoidal structure. Are concordant with gneisses, sometimes

forming elongated crystals. The rocks are white colored and fine grained, generally massive and crystallized.

From climate change as a predominance of dry weather, with torrential rains, concentrated in a short time (arid climate), causing large mass movements and transfer of materials, this weathered layer during the wet weather was transported to remote areas and associated with the plan on a regional basis. It was during the dry weather which processed the horizontal development of alluvial plains, with the extension of interfluves. These climatic variations have formed key elements related to the fluctuations of sea level.

From the reworking of the Barreiras Formation sediments along the coastlines, providing granular and fine sediments from rivers of the region and the inner shelf and associations with cross-regressive fluctuations of sea level, were being formed at the eastern coastal plains and northeastern Brazil. These sediments are locally found near the town of Barreiras.

The alluvial sediments, colluvium locally, are dominated by clays and clayey and organic sand, present in the plain of the creek Coaçu.

1.3.4 – Close Mining

Close to CONE Mine Exploration's Project, there are several areas of mineral exploration owned by VALE, among other companies for iron ore, manganese, limestone, copper, marble and granite.

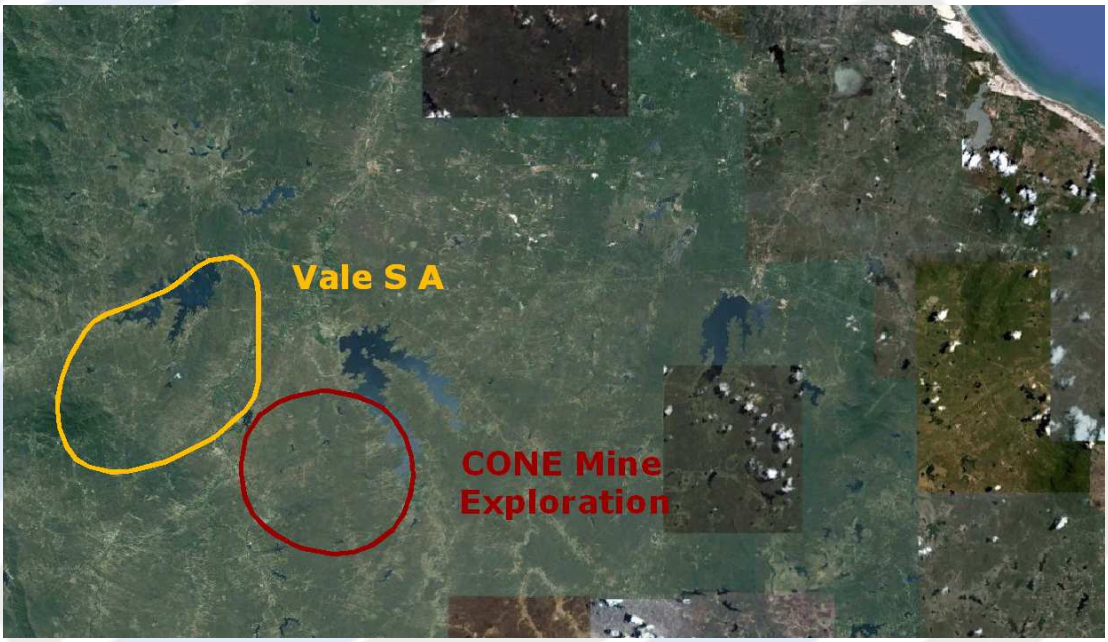

Figure 3 – Close Mining

1.4 – LOCALIZATION

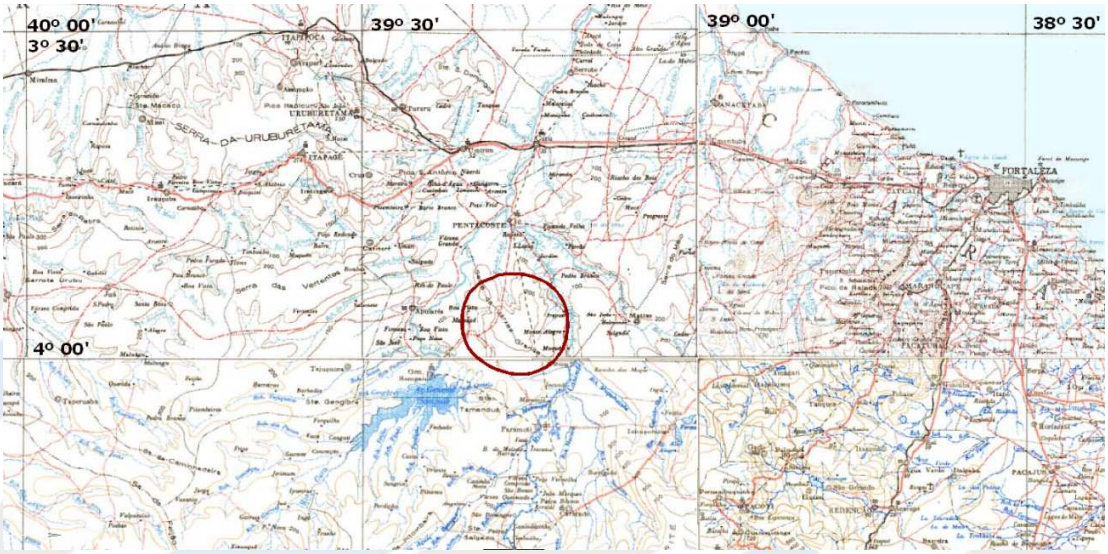

Figure 4 – Localization (base IBGE)

Figure 5 - Localization

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1.6 – MUNICIPALITY OF PENTECOSTE

1.6.1 – Characterization

Area: 1.378,30 km²

Altitude: 60 m

Climate: Tropical warm Semi-arid bland

Raining Period: January to April

Rainfall: 817 mm

Hydrographic Bay: Curu River Bay

Main Rivers: Curu River, Pereira de Miranda Dam and Caxitoré Dam

1.6.2 – Population

Total: 35.166 habitants (IBGE 2009)

Population Density: 23,8 hab./km²

1.6.3 Transportes

Highways

Approximate Distances to the main centers (Km):

Fortaleza: 89
Natal: 594
São Luís: 799
Brasília: 2.053
Salvador: 1.268
Rio de Janeiro: 2.650

Bounds Municipalities:

UMIRIM

SÃO LUÍS DO CURU

SÃO GONÇALO DO AMARANTE

CAUCAIA

MARANGUAPE

CARIDADE

APUIARÉS

ITAPAJÉ

2 – LOGISTIC AND ACCESSIBILITY

2.1 – HOW TO ARRIVE

Leaving from Fortaleza, take the BR-020, southwest exit of town. Follow only 8 Km and take the BR-222 west. After about 52 km turn left at the EC-135. From there follow more 23 Km and turn left at the EC-162. The project area is located 9 km from there.

2.2 – MAIN HIGHWAYS OF ACCESS

The main access routes to the process area are the BR-020, BR-222, EC-135 and EC-162 plus secondary roads near the area.

2.3 – AIRPORT

The main airport close the area is the Pinto Martins International Airport in Fortaleza, about 94 km away from the area. It is the third largest airport in the northeast after Salvador and Recife. Frequently hosts domestic and international chartered flights.

Figure 6 – View of Fortaleza Airport

2.4 – RAILROADS

2.4.1 – Transnortheastern Railroad

The new Transnortheastern, 1,728 km long, is a railroad linking the ports of Pecém (EC) and Suape (PE) to the savanna of Piauí, in the municipality of Eliseu Martins. The purpose is to raise the competitiveness of agricultural and mineral production in the region with a modern logistics of a railroad linking high performance and deep draft ports that can accommodate large ships.

Until reaching the design of the current stroke, experienced consultants were hired to mineral and agricultural exploration to identify potential charges that could support the railroad growth.

This, added to the fact that there are two new ports in the northeastern and deep draft, led to the solution: building a world-class railroad which, next to the existing parts, could give a respectable competitive advantage to products of the savanna. Soybeans, which grew at rates exceeding 17% per year between 1992 and 2004 in the northeastern grasslands, along with corn and cotton, could become the anchor load that will make the new development sustainable.

Halfway there, a huge and already known deposit of gypsum also gains a competitive blow capable of revitalizing the region. To these two loads add the biodiesel and fuels, with excellent growth prospects, the major producer of fruits in Pernambuco more ethanol production that begins in the savanna, in addition to exceptional opportunities for the transportation of iron ore. It is ready a mix of loads able to sustain a development sustainable.

The projections of the railway link to a transport of 17 million tons of load in 2010 and about 27 million in 2020. Construction began on June 6, 2006 and scheduled for conclusion in December 2010.

Segment of the Transnortheastern Kilometrage:	
Missão Velha - Salgueiro	96 km
Missão Velha - Pecém	527 km
Salgueiro - Suape	522 km (Already passing through Arco Verde)
Salgueiro - Trindade	166 km
Trindade - Elizeu Martins	420 km
Total	1.728 km

Figure 7 - Railroads in Northeast Braz

The railroad now operates 4,238 km of metric gauge railroad, and 17.5 km, within the port of Itaqui (MA), are mixed gauge to allow access of trains from Carajás Railroad operating in broad gauge (1.60m).

http://www.csn.com.br/portal/page?_pageid=595,214999&_dad=portal&_schema=PORTAL

2.5 – PORTS

2.5.1 Pecém Port – CE

The Port of Pecém, located in the municipality of São Gonçalo do Amarante, 56 km from Fortaleza, in an area of 330 square kilometers, received investments of about R$ 700 million to adapt to the intense movement of imports and exports of dry cargoes of agribusiness products, a booming segment. Are two berths of 350 meters long and 15 meters deep, a modern cargo terminal with cooling chambers and appropriate access infrastructure and competitive operating costs to give vent to 56% of exports from Ceará (72% of foreign sales of fruit) , to the east coast of the United States, northern Europe and Mediterranean.

The Port Complex of Pecém aims to support the operation of port activities and integrated industrial, essential to the development of a complex with characteristics of Industrial Port. Consisting of two marine Piers, one for supplies and steel products and other general cargo and bulk liquid, especially crude oil and oil started its commercial operations in November 2001, being inaugurated in March 2002.

With the installation of a refinery with a production capacity of 300,000 barrels of oil per day, a steel plant which will produce eight tons of steel per year, and the needs of Railroad Trans, the stretch of Ceará, expected to carry 12 million tons of iron ore per year, the Port of Pecém.

Figure 8 – View of Pecém Port

Because it is a terminal off shore Pieres the mooring are protected from wave action and currents by a breakwater from the kerbside, in the form of "L" with 1768 meters long. Pieres Both are connected to the mainland by a road bridge, which connects Patio Storage facilities for the mooring of vessels.

The Complex operates by moving raw steel, finished steel products, fertilizers and grain in bulk, containers and bulk liquids and gases.

It is about to be tendered a project to expand the port terminal of Pecém involving funds of around R$ 1.3 billion. The Port Terminal Pecém is already the fourth largest exporting port in the Northeast and the first fruit exports to Brazil. The expansion and deployment of the Multiple Use Terminal (TMUT), aim to meet the growing cargo handling multiple and general. The expansion project includes construction of a new access bridge to the existing breakwater, with

1800 meters long, paving a thousand meters above the breakwater, construction of 930 meters of pier with three berths for Export of plates produced by Companhia Siderurgica Pecém two piers of bulk liquids for the future operations of the refinery, a pier of solid bulk cargoes for the operation of the Trans Logistics and support buildings. It will consolidate the terminal expansion, increasingly, as a hub port for cargo since its physical plant will allow the berthing of large ships and the Port of Pecém is right on the sea route through which passes a substantial portion of world trade.

Steel Mill at the Port of Pecem

New development involving the State Government, the Brazilian group Vale and Korean Dongkuk, the Steel Company Ceara, to be installed in Pecem, will receive US$ 6 billion in investments. Only the first step, will produce 2.5 million tons of steel slabs per year and may be expanded to 5 million. The project should generate about five thousand jobs in its operation. The new unit will have as an energy source mineral coal, and should start operating within three and a half years.

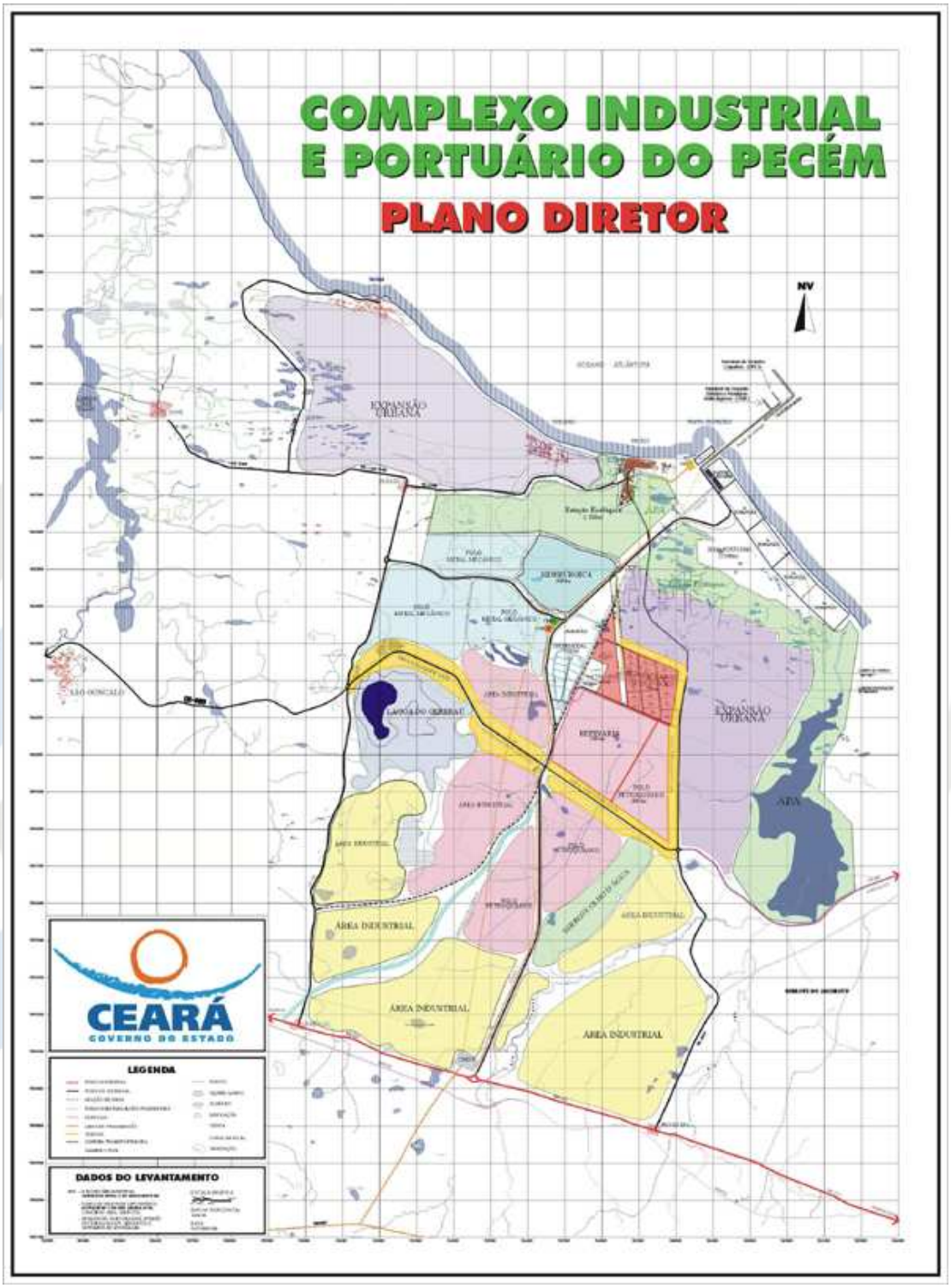

Figure 9 – Schematic map of the Industrial Complex and Harbor of Pecém

http://www.cearaportos.ce.gov.br/

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2.5.2 – Port of Fortaleza – CE

With over half a century of activity, the Port of Fortaleza, also known as Mucuripe Port is one of the most important marine terminals and strategic in the country (Mucuripe Bay in Fortaleza, Ceará), holds it in proximity to the markets of North America and Europe, allowing the service to shipping companies with regular routes to ports of the United States, Canada, Central America, Caribbean, Europe, Africa and the Mercosur countries, as well as routes to other brazilians ports through coastal shipping.

Its influence area covers the states of Ceará, Piaui, Maranhão, Rio Grande do Norte, Pernambuco and Paraiba, extending also to the North, Midwest and the Valley of São Francisco River.

In Mucuripe Port is located one of the largest swarthy poles in the country and a versatile infrastructure that allows the movement of different types of goods, divided into dry bulk (grains, cereals, etc.), liquid bulk (petroleum products), loose and containerized general cargo. About 1500 people work at the Port. Cashew nuts, carnauba wax, metal, textiles, fruits, wheat, malt, lubricants, fuels and oil products are among the main products handled by the Port.

In the retro port and port area are located three flour mills, the two of the largest producers of pasta, crackers, flours and mixes in the country, as well as their headquarters. They are J. Macedo and M. Dias Branco. The last one also has a margarine factory in the port area.

Can be found just nine fuel distribution tank farm with total of 215.000m³ and Lubnor a refinery owned by Petrobras, the 4th largest producer of asphalt and the country and the only domestic manufacturer of naphthenic lubricants.

It is responsible for 20% of all VAT collected in the state of Ceara. Currently undergoes expansion works, doubling the production capacity.

Figure 10 – View of Fortaleza Port (Mucuripe)

http://www.docasdoceara.com.br/o-porto

3 – COSTS

3.1 – EXPLORATION

To defining the economic possibilities of the area to explore, will be accomplished the necessary works of prospection that will consist, in the beginning of the following listed steps. However, having the currently existing data, these can not be considered as definitive.

3.1.1 – Base-Map Elaboration

The cartographic base to the programming, register and analysis of the exploratory work will be obtained by the restitution of the air photograph, available at 1:40.000 and 1:20.000 in recent images.

The plan will have scale 1:10.000, adjusted with field topographical control and spaced level curves in 5 m

3.1.2. – Opening and Conservation of Roads

The field exploration implantation should be preceded of recovery works and improvements in the stream bed of the secondary roads that cut the area, opening of new routes, in order to facilitate the access to the distant places.

3.1.3. – Geologic Mapping 1: 10.000

It is essential the execution of the basic geological mapping, aiming to the identification and cartography of the levels potentially mineralized, as noted above. So, the whole lithological suite in the area should be identified petrographically, with delimitation as accurate as possible from the contacts of the marked units.

The accurate definition of contacts, and petrographic characterization of the emerging lithology, may eventually require the opening of the trenches, in order to expose the rocky substratum to the geologist observation.

The resulting geological map, as mentioned previously, should be presented at scale 1:10.000. To it will be integrated obtained information posteriorly, during the exploration with the execution of trenches, boring and galleries.

3.1.4. – Geophysical Prospection

Intend to accomplished a geophysical prospection in the area, conciliating two geophysical methods, as seismic and resistivity, aiming to detect possible anomalies that become into target for the investigation work in subsurface, posteriorly.

3.1.5. – Digging

It will be executed exploration's digging, aiming to obtaining information of sub-surface and to propitiate the exposition of the mineralized bodies for the description of the points and posterior sample collection.

Opted by the execution of the trenches (or "pipe") and galleries to the characteristics' determination of the mineralized bodies, once that these ones present partially emerging and in an area of difficult access and mechanical equipment.

The trenches will be directed perpendicularly to the layers' direction. The digging will be made with manual tools, as pickaxes and shovel. To the execution of the service will be contracted the local workforce.

The works will be following by the responsable technician.

3.1.6. – Boring

From the analysis of the obtained data in the geologic mapping, will be leased some orificies of borehole, comprehended in three stages. In the end of each boring stage, an evaluation will be made, aiming to the taking a decision as for the continuity of the exploration.

It is expected, in the three stages a boring with continuous coring. The works will be contracted with specialized companies.

The description of the testimony will include the petrographic aspects, stratigraphic and structural. The intervals will have maximum length of 1,5m, eventually extended to 2,0 m in the portions confessedly sterile.

3.1.7. – Chemical Analysis

The chemical analysis will be executed in a specialized laboratory and will include the grades of Fe, FeO, Mn, SiO_2, Al_2O_3, CaO, MgO, TiO_2, S, P and others elements traces.

3.1.8. – Technological Assays

It will be sending samples of ore for the execution of the technological assays in specialized laboratory that include granulometry analyses and the following tests:

- Tumbling Iso
- Crepitation Coisrmj
- RDI Coisrmj
- Reduction JIS M 8713
- Midrex Linder Test
- Sulphur Release

These tests propitiated the verification of the material adequacy to the use in siderurgy, consisting of an evaluation for use in blast-furnace and for use in process of direct reduction.

3.1.9. – Final Report

Completed the exploration, the final report will be in charge of the petitioner's technician team, under the technician responsibility of the works' chief geologist and bunched the whole list of the executed activity, the

methodology and the reached results. It should be conclusive as to the reserves existence, its dimensions and the ore characterization, and will have all the elements indispensable to the technician, business and politics decisions which will be followed.

3.1.10. – Budget

It is considerer on this study the reference Exchange rate as being US$1.00 = R$1,85

For the execution of the exploration works described above, it is esteem a total cost of **US$ 6,209,464.86**.

3.2 – MINE WORK AND PROCESSING (IRON ORE)

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:

3.2.1. – Production Datas (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

*P.S..: Considering a recovery of 80% in the process.

Considering the relation sterile/ore = 2/1

3.2.2 – 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

3.2.3 Cost of the Processing (Monthly Estimates)

Material/Maintenance = R$300.000,00

Crusher Feeding = R$150.000,00

Mill Maintenance = $ 50,000.00

Flotation = R$ 200.000,00

Electric Energy = R$ 600.000,00

General Expenses = R$ 120.000,00

Quality Control = R$60.000,00

Unit Cost = R$ 7,40 (US$ 4.00) / ton of product

MONTHLY TOTAL (USD) = US$ 800,000.00

3.3 – ROAD TRANSPORT

The considered road transport is in relation to the distance between the area and the National Railways Company – CFN. The estimative base is about R$ 0,1875/km/ton of sinter in dump trucks of 30 tons.

Mine-terminal distance: 25km

Unit Cost = R$ R$ 4,69 (US$ 2.53) / ton

MONTHLY TOTAL (USD) = US$ 506,756.76

3.4 – 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 Pecém. So for a monthly estimate, we have:

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

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

3.5 – RAILROAD TRANSPORT

The railway takes as a basis for estimating 65 km used by the services of the concessionaire's National Railway Company – CFN between the municipality of São Luíz do Curu and the Port of Pecém in São Gonçalo do Amarante.

Unit Cost = US$ 12.50 / ton

MONTHLY TOTAL (USD) = US$ 2,500,000.00

3.6 – PORT

The port costs involve unloading, stockade and loading in ships. The estimated average cost for ports in Ceará 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

4 – 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 to the monthly cost of **US$ 8,656,756.76** to 200 thousand commercialized tons. Considering an extra US$10.00/ton for additional costs, this give us a FOB cost of **US$53.28/ton.**

This represents a rude profit potential of **US$ 31.72/ton** commercialized, equivalent of **60% of a profit over the total cost** of the productive chain.

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

5 – MINE WORK AND PROCESSING (LIMESTONE)

The cost with the mine work of limestone ore for monthly production estimate in 20,000 tons and its respective processing are presented as follow:

5.1 – Production Datas (Monthly Estimates)

					Production rate	
Mines' extraction	9	h/day	26	day/month	**85.50**	**t/hour**
Processing	9	h/day	26	day/month	**85.50**	**t/hour**

Monthly Production of the Extracted Ore = 20,000 tons

Monthly Production of the Processed Ore = 20,000 tons

*P.S..: Considering a recovery of 100% in the process.

5.2 – Cost of the Mine work (Monthly Estimates)

Cut and ROM Load (R$1,00/t) = R$ 20.000,00

ROM Transport = R$ 15.000,00

Drilling and Dismounting = R$ 15.000,00

Road Maintenance = R$ 5.000,00

Sterile Transport (R$0,50/t) = R$ 10.000,00

Cut and Load of Sterile (R$0,50/t) = R$ 10.000,00

General Expenses = R$ 8.250,00

Unit Cost = R$ 4,16 / ton (US$ 2.25)

MONTHLY TOTAL (USD) = US$ 45,000.00

5.3 – Cost of the Processing (Monthly Estimates)

Material/Maintenance = R$12.000,00

Crusher Feeding = R$15.000,00

Crushing = R$30.000,00

Electric Energy = R$ 15.000,00

General Expenses = R$ 12.500,00

Quality Control = R$5.000,00

Unit Cost = R$ 4,62 (US$ 2.50) / ton of product

MONTHLY TOTAL (USD) = US$ 50,000.00

6 – ECONOMIC POTENCIAL OF THE COMPANY

Verifying the exploration positive result according to the accomplished estimates, the company will make possible the commercialization of the ore FOB to the monthly cost of **US$ 95,000.00** to 20 thousand commercialized tons. Considering an extra US$10.00/ton for additional costs, this give us a FOB cost of **US$ 4.75/ton.**

This represents a rude profit potential of **US$ 13.25/ton** commercialized, equivalent of **279 % of a profit over the total cost** of the productive chain.

Consideration: Exchange: US$1.00 = R$1,85 and sale's value of the ore US$ 18.00).