



# CONE

MINE EXPLORATION

## **Alvorada Project**

Manganese Ore

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# Alvorada Project

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## General Description

1. Mineral: Manganese
2. Area: 955 ha
3. Location: state of Rondonia, in the northern region of Brazil
4. Assets:
  - Ranch over the area
  - The manganese ore reserves sum up to 21,242,200 tons
5. Reserves table – as it was written on the Final Research Report

Reserve	Tons	Average Grade	Average Price / R\$	Total / R\$	Monthly Production	Life in months	Life in years
Measured	7,175,000	43% - 50.95%	150.00	1,076,250,000.00	20,000	359	30
Indicated	6,398,000	43% - 50.95%	150.00	959,700,000.00	20,000	320	27
Inferred	7,669,200	43% - 50.95%	150.00	1,150,380,000.00	20,000	383	32
<b>Total</b>	<b>21,242,200</b>			<b>3,186,330,000.00</b>		<b>1,062</b>	<b>89</b>

6. Chemical composition of the ore

Chemical Composition - Manganese Ore - SGS do Brasil LTDA							
SiO <sub>2</sub>	3.59%	CaO	0.11%	P <sub>2</sub> O <sub>5</sub>	0.47%	Mn	50.95%
Al <sub>2</sub> O <sub>3</sub>	3.68%	TiO <sub>2</sub>	0.08%	K <sub>2</sub> O	0.20%	P.F.	11.91%
Fe <sub>2</sub> O <sub>3</sub>	2.14%	MgO	0.15%	Na <sub>2</sub> O	17%		

7. Mining Process at the National Department for Mineral Production
  - Partial Research Report handed on June 12<sup>th</sup>, 2008 – reporting reserves of 7,114,500 tons
  - Operating License for Experimental Mining works granted
  - Usage Guide allowing 6,000 ton exploitation granted
  - Final Research Report handed on December 6<sup>th</sup>, 2012 – reporting reserves of 21,242,200 tons. Approved on June 6<sup>th</sup>, 2013.
8. Infra-structure
  - The mineralization is 420km away from the river port in the city of Porto Velho, RO. All access roads are paved and in great use conditions.
  - The river port in Porto Velho is on the Madeira River. All custom processes are done at this port. The transportation and loading is done through barges until the Port of Manaus or Port of Itacoatiara, both in the state of Amazonas, where the transshipment is done to ships capable of carrying up to 75,000 tons – Panamax.

- The logistics through the Panama Canal, what reduces circa 2,000 km to Shanghai, in China.

## The Project

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The project aims the extraction of the manganese ore, what comprehends the operations of exploitation, crushing, rinsing, and products classification (sinter feed or lump). The exploitation is through open pit, what ease the processes and reduce costs.

### Products and Services

- Crude Manganese Production – 1<sup>st</sup> and 2<sup>nd</sup> stages
  1. Extraction (primary crushing and secondary crushing)
    - Manganese Ore (10 – 100 mm)
    - Fines (below 10 mm)
    - Tailings
- Processed Manganese Production (powder) – 3<sup>rd</sup> stage
  2. Processing
    - Manganese Monoxide
    - Manganese Dioxide
  3. Concentration
- Ferromanganese (ingots) – 4<sup>th</sup> stage
  4. Casting
    - Ferromanganese
    - Electrolytic Manganese

## Environment

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The project has a sustainable approach through actions that respect the environment and the use of mineral resources in a sustainable way.

In order to follow the legislation, constant studies on environmental impact are done, even though the project is not within any official preservation area.

The State Department of Environment of the State of Rondônia issued the usage guide that allows the experimental exploitation of the ore.

The implementation of the project does not need any of the following:

- a. Displacement of population or affect the health of its inhabitants;
- b. Deviation from course or contamination of rivers;
- c. Deforestation that will affect the flora, fauna or cause significant impact to the environment;
- d. Water catchment of groundwater or surface water in large proportions;
- e. Drainage in more than one hundred hectares;

- f. Use of radioactive supplies or production of radioactive substances.

## Foreign Market

The geographic location of the mine (in the north of Brazil) and the absence of metallurgical plants nearby, make it feasible to export all the manganese production.

## Implementation

All the modules of the project can be fully implemented in circa 12 months, starting as soon as the resources are available.

The industrial plant proposed allows the company to produce 25 thousand tons initially, and after the sixth month, it can reach up to 50 thousand tons.

## Raw Materials Availability

The project does not need to acquire any external raw materials; the ore extracted is the very raw material used in the operations.

## Sales Estimation

Stage 1 - First Six Months			
Description	Volume (tons)	Price per ton	Value (USD)
Crude Manganese	150,000	USD 250.00	37,500,000.00
Manganese Monoxide	6,000	USD 1500.00	9,000,000.00
Fines (Sinter Feed)	6,000	USD 280.00	1,680,000.00
Tailings	12,000	USD 280.00	3,360,000.00
<b>Total</b>			<b>51,540,000.00</b>

Stage 2 - Starting in the Seventh Month			
Description	Volume (tons)	Price per ton	Value (USD)
Crude Manganese	300,000	USD 250.00	75,000,000.00
Manganese Monoxide	12,000	USD 1500.00	18,000,000.00
Fines (Sinter Feed)	12,000	USD 280.00	3,360,000.00
Tailings	24,000	USD 280.00	6,720,000.00
<b>Total</b>			<b>103,080,000.00</b>

## Chemical Analysis







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**CERTIFICADO DE ANÁLISES**  
**GQ0902634**

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Análises	SiO2	Al2O3	Fe2O3	CaO	TiO2	MgO
Método	XRF79C	XRF79C	XRF79C	XRF79C	XRF79C	XRF79C
Unidade	%	%	%	%	%	%
Limite Detecção	0,10	0,10	0,01	0,01	0,01	0,10
BRANCO_PREP	98,86	0,32	0,93	0,03	0,02	<0,1
A-1	3,59	3,68	2,14	0,11	0,08	0,15
* REP BRANCO_PREP	98,99	0,33	0,91	0,03	0,01	<0,1





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Análises	P2O5	K2O	Na2O	Mn	P.F.
Método	XRF79C	XRF79C	XRF79C	XRF79C	PHY01E
Unidade	%	%	%	%	%
Limite Detecção	0,010	0,01	0,10	0,01	
BRANCO_PREP	0,017	0,04	<0,1	<0,005	-0,24
A-1	0,463	0,20	0,17	50,95	11,91
* REP BRANCO_PREP					-0,25
* REP BRANCO_PREP	0,015	0,04	<0,1	<0,005	

**Mn**

**XRF79C**

**%**

**0,01**

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**<0,005**

**50,95**