

The Republic of the Union of Myanmar

Ministry of Mines



11th INTERNATIONAL CONFERENCE ON MINING AT CHIANG MAI
Session on “ASEAN Mineral Potentials and Mining Law”
(11.11.2013 – 12.11.2013)

“Active Mining Projects in Myanmar”

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11th November 2013

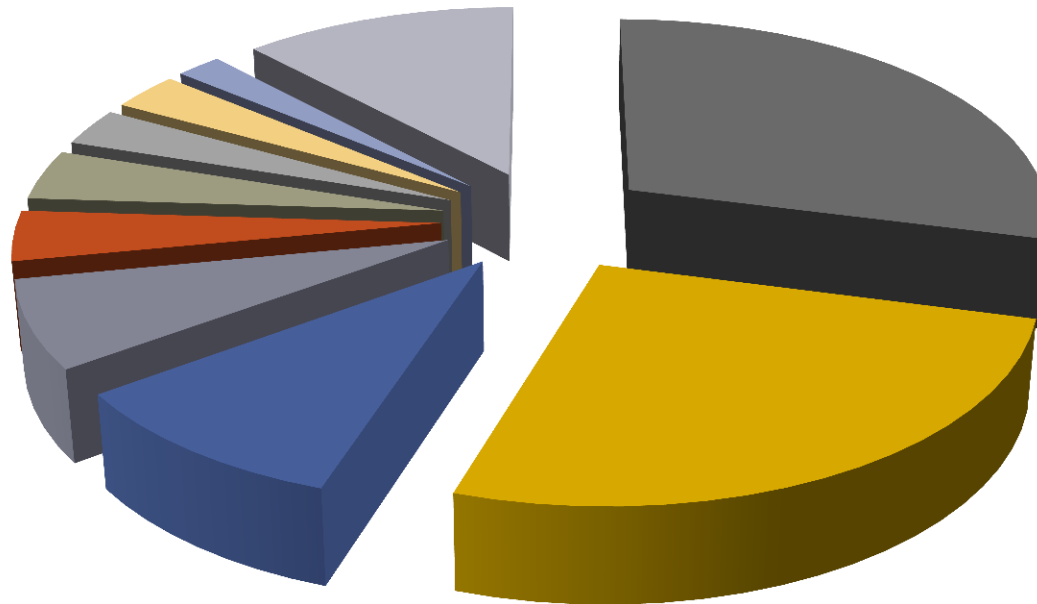
Types of ore in myanmar

Most of the Myanmar Mining Projects extract non-ferrous metals, ferrous metal, precious metal, industrial minerals and also Jade and Gems.

- Copper, Lead, Zinc, Antimony, Manganese, Chromite, Nickel, Chromium.
- Iron.
- Gold, Silver, Tin, Tungsten, Rare Earth.
- Ruby, Sapphire, Jade, Gem, Diamond.
- Dolomite, Limestone, Barites, Gypsum, Granite, Decorative Stone, Quartz for production of silicon.
- Coal.

PRODUCTS SALES

Sales



- natural gas (29%)
- mineral (26%)
- beam and pluses (10%)
- forest products (7%)
- garment (4%)
- fishery products (4%)
- raw rubber (3%)
- agriculture products (3%)
- rice (2%)
- others (12%)

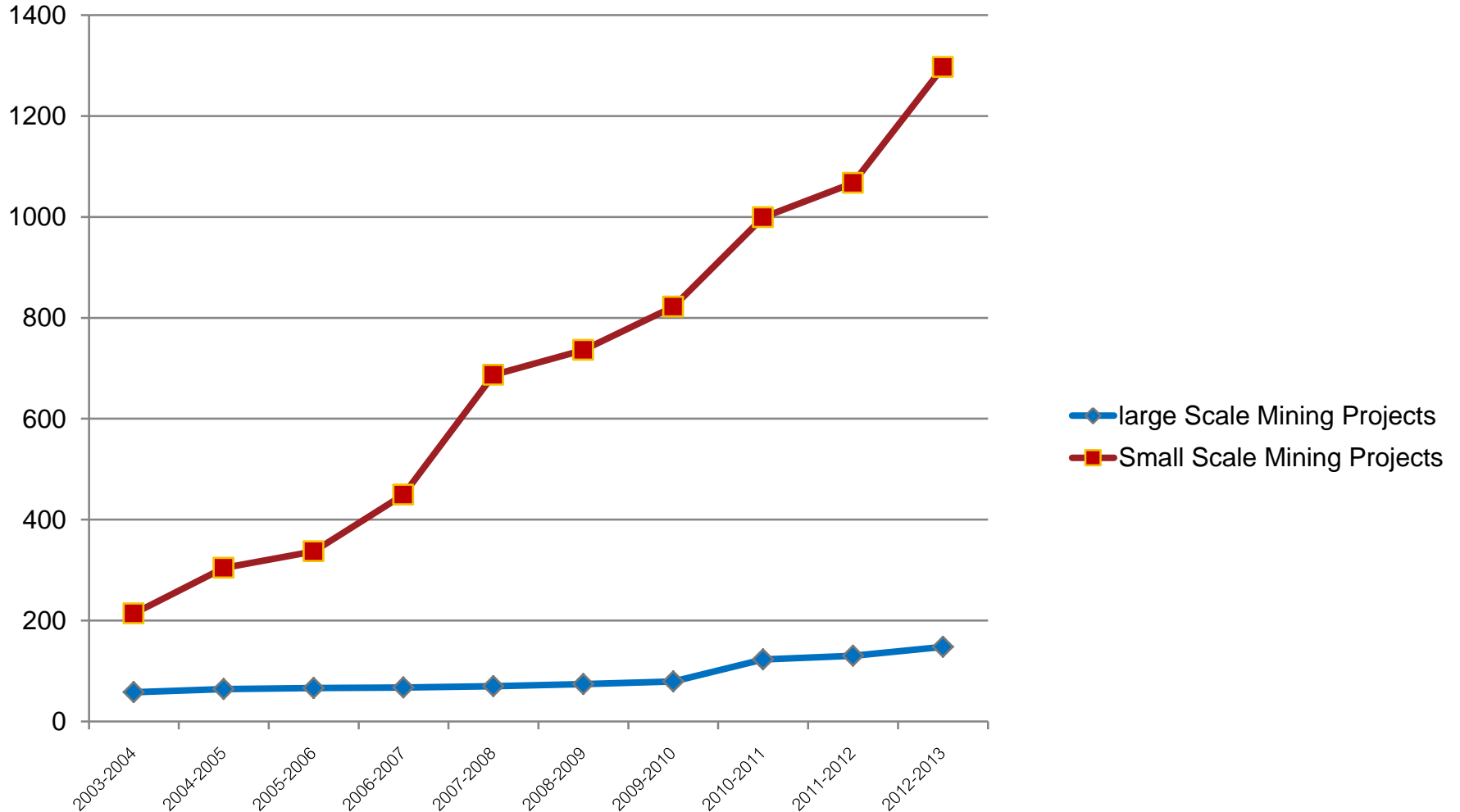
RECENT MINING PROJECTS

2012-2013 fisical years



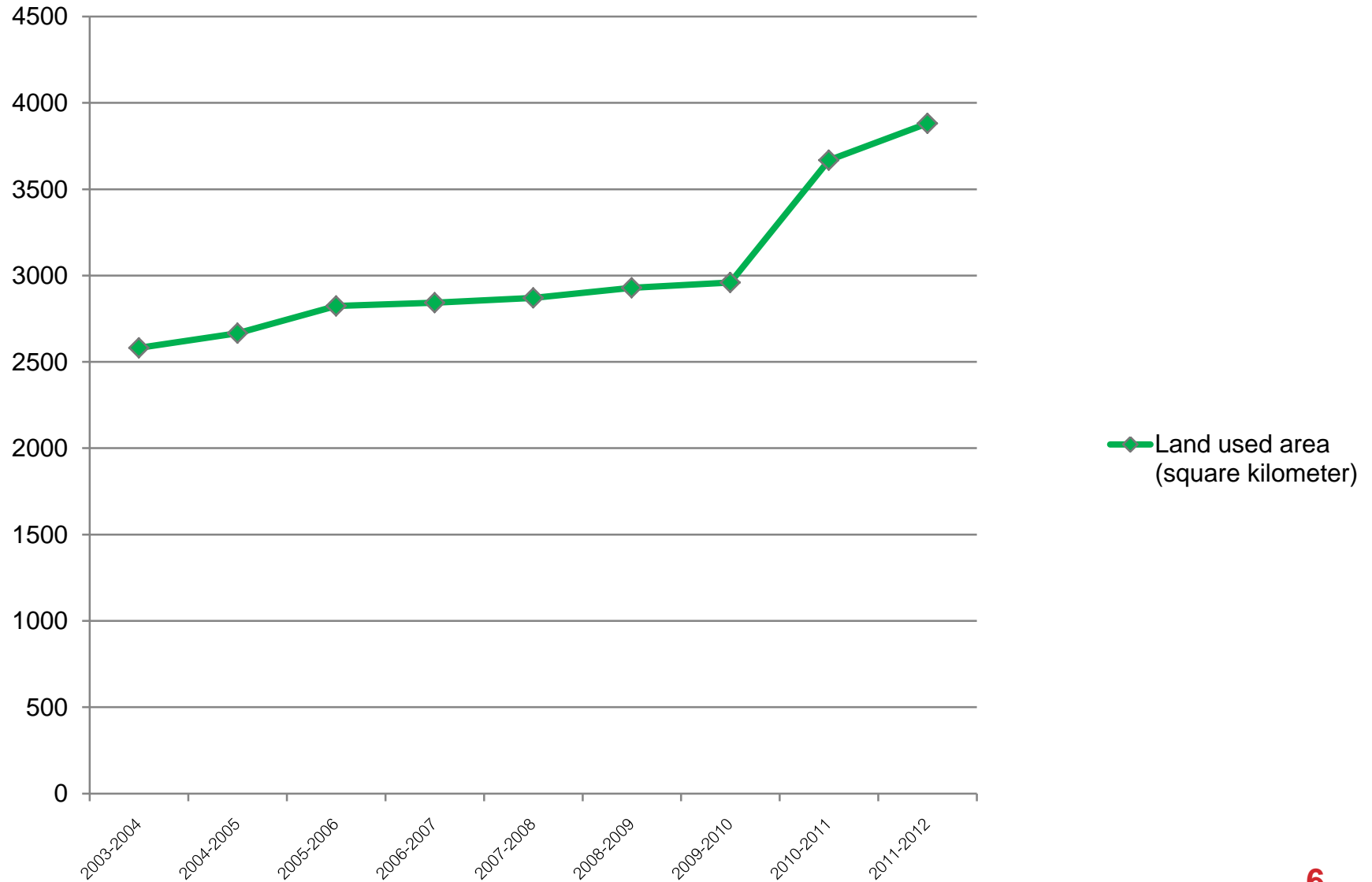
- Exploration
426 no.s
- Small Scale Mining 1297
no.s
- large Scale Mining 148
no.s
- others
46 no.s

Graph of Mining Projects increasing rate



Land used area of Mining Projects

Land used area (square kilometer)



FDI Investment in Myanmar Mining Sector

Sr.	Company	Registered Country	Type of Mineral	Type of Permit
1.	Conerstone Resource (Myanmar) Ltd	Australia	Zinc Ore	Large Scale Mining Permit
2.	Myanmar Ponepipet Co.,Ltd	Thailand	Tin Concentrate	Large Scale Mining Permit
3.	Myanmar CNMC Nickel Co.,Ltd	China	Ferronickel	Large Scale Mining Permit
4.	Simco Song Da Joint Stock Co.,	Vietnam	Marble	Large Scale Mining Permit
5.	Asia Pacific Mining Ltd.	China	Lead, Zinc , Copper, Gold	Exploration Permit
6.	Nobel Gold Limited	Russia	Gold and Associated Minerals	Exploration Permit
7.	North Mining Investment Co., Ltd.	China	Ferronickel	Feasibility Study
8.	De Rui Feng Investment Co., Ltd.	China	Tin-Tungsten	Exploration Permit
9.	Myanmar Yangtze Copper Co., Ltd.	China	Copper	Large Scale Mining Permit
10.	Myanmar Wanbao Copper Co., Ltd.	China	Copper	Large Scale Mining Permit

Large Scale Mining Projects

Sr.	Company	Registered Country	Type of Mineral	Type of Permit
1.	Conerstone Resource (Myanmar) Ltd	Australia	Zinc Ore	F D I
2.	Myanmar Ponepipet Co.,Ltd	Thailand	Tin Concentrate	F D I
3.	Myanmar CNMC Nickel Co.,Ltd	China	Ferronickel	F D I
4.	Simco Song Da Joint Stock Co.,	Vietnam	Marble	F D I
5.	Myanmar Yangtze Copper Co., Ltd.	China	Copper	F D I
6.	Myanmar Wanbao Copper Co., Ltd.	China	Copper	F D I
7.	Kyauk Pa Hto Gold Mining Project	Myanmar	Gold	Large Scale Mining
8.	Top Ten Star Mining Project	Myanmar	Lead-Zinc	Large Scale Mining

Large Scale Mining Projects in Myanmar

Sr.	Company	Registered Country	Type of Mineral	Type of Permit
9.	Myanmar Economic Corporation	Myanmar	Coal	Large Scale Mining
10.	May Flower Mining Enterprise Co.,Ltd.	Myanmar	Coal	Large Scale Mining
11.	May Flower Mining Enterprise Co.,Ltd.	Myanmar	Coal	Large Scale Mining
12.	May Flower Mining Enterprise Co.,Ltd.	Myanmar	Coal	Large Scale Mining
13.	Sein Nga Man Mining Co.,Ltd.	Myanmar	Tin-Tungsten	Large Scale Mining
14.	Good Brother Machinery Co.,Ltd,	Myanmar	Lime stone	Large Scale Mining
15.	No.3 Heavy Industry	Myanmar	Marble	Large Scale Mining
16.	No.3 Heavy Industry	Myanmar	Marble	Large Scale Mining

KYAUK PA HTO GOLD MINING PROJECT

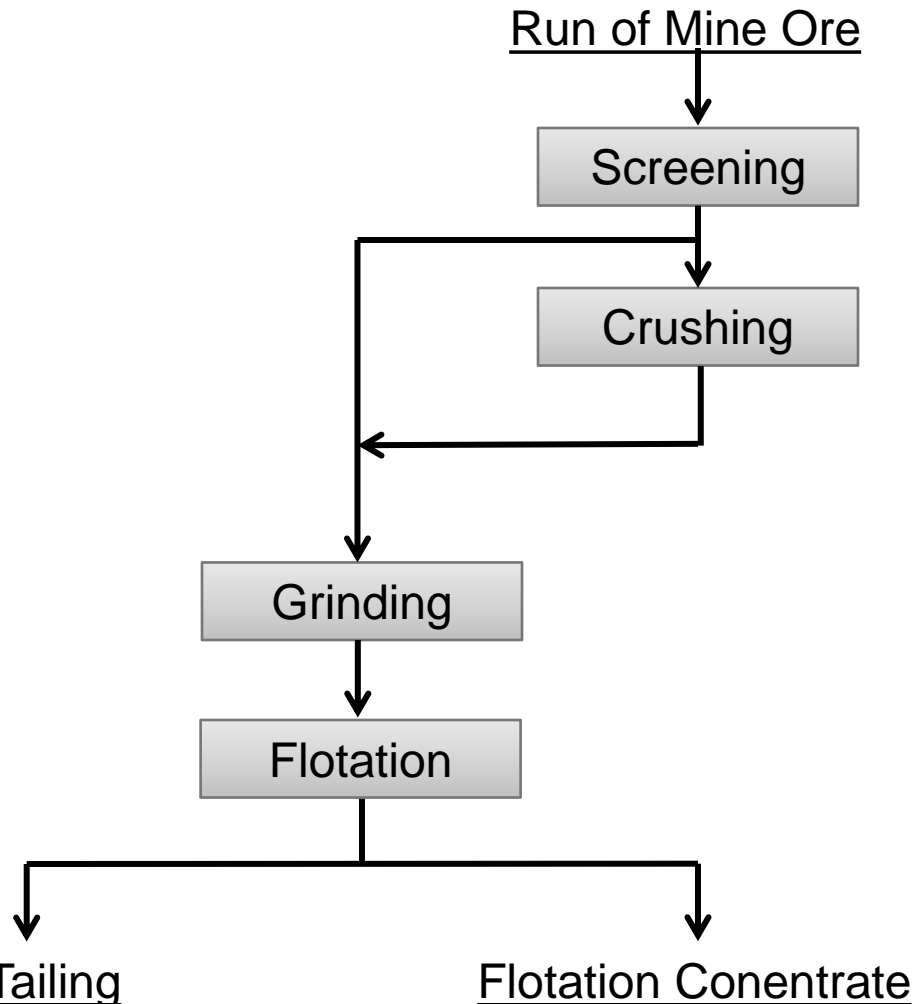


Kyauk Pa Hto Gold Mine Project

Location	-	Ban Bwe Kon Village, Kawlin Township, Sagaing Division.
Type of ore	-	Sulphide and oxidized ore
Au content	-	2-3 ppm
Plant Capacity	-	1000 tons/day
Process	-	Cyanidation Process
Main Steps	-	Comminution Flotation Roasting Cyanidation (Carbon in Pulp & Heap Leach) Electro-winning Stripping Refinery
Product		Refined Gold

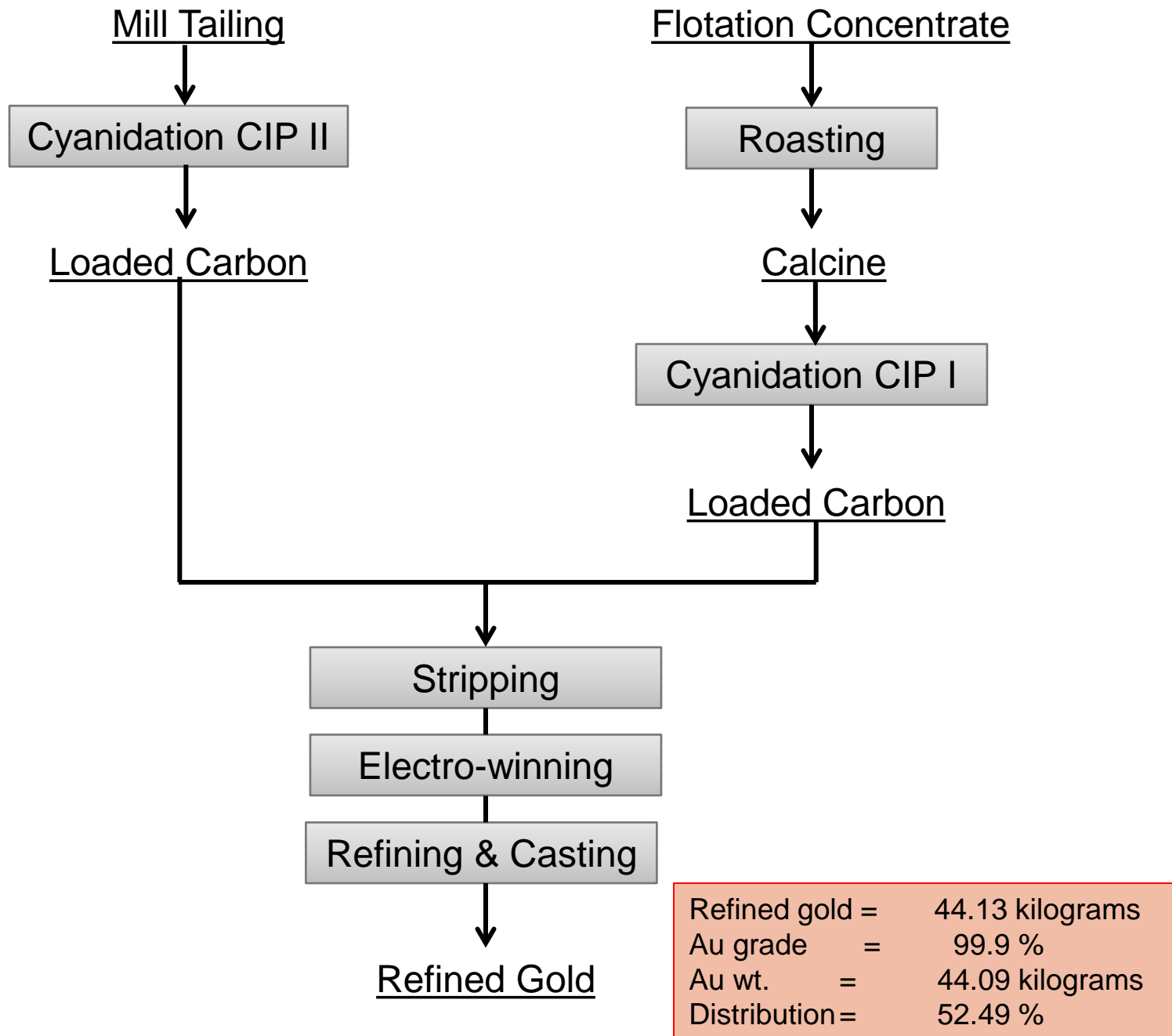
Flow Sheet of Kyauk Pa Hto Gold Mining Project

Ore wt.	= 30000 tons/month
Au grade	= 2.8 ppm
Au wt.	= 84 kilograms
Distribution	= 100 %



tailing	= 29400 tons
Au grade	= 1.14 ppm
Au wt.	= 33.6 kilograms
Distribution	= 40 %

Conc. wt.	= 1008 tons
Au grade	= 50 ppm
Au wt.	= 50.4 kilograms
Distribution	= 60 %



Flotation Plant



Mill Tailing Cyanidation Plant (CIP II)



Calcine Cyanidation Plant (CIP II)



Mill Tailing Cyanidation Plant (CIP II)



TAKAUNG TAUNG FERRO-NICKEL PROJECT



TAGAUNG TAUNG FERRO-NICKEL PROJECTS

Location	-	Tagaung Taung area, Htee Gyaint Township, Mandalay Division and Thabeikkyin Township, Sagaing Division.
Type of ore	-	Laterite ore
Ore assay result		Ni 1.93-2.3%, Fe 12.21-16.50%, SiO ₂ 38.81- 44.39%, MgO 15.14-19.61%
Plant Capacity	-	1320000 tons/annum (dry ore)
Process	-	Roasting, Smelting and Refining
Products	-	Ferronickel (26%Ni) Granules 85000 tons/annum
Ferronickel assay-		Ni 26-32%, Fe 67-79%, C ≤ 0.03%, Cr ≤ 0.05%, Cu ≤ 0.06%, Co ≤ 0.25%, P ≤ 0.01%, S ≤ 0.03%, Si ≤ 0.05-0.15%

Geological Resources

Geological Resources

- **Type** laterite type nickel silicate
- **Location** 96° 06'-95 ° 10'E and 23 ° 33'-23 ° 36'N
- **Layers 3 layers**
 - laterite overburden with relatively (low nickel content)
 - nickel bearing limonite layer (secondary ore layer)
 - nickel bearing saprolite (main ore layer)
 - Ore tonnage estimated tonnage
22,690,000 tons
1.96% Ni.
 - Metal content 444,000 tons
(cut-off grade 1.4% Ni)



Nickel Deposits and Mining Method

Nickel Deposits

Mainly includes four ore bodies, No. 1, 2, 3 and 4. No.1 ore body is the largest one and it's reserve for over 95% of total ore reserve. Remain are considered as potential resources.

Mining Method

- Overburden stripping.
- Cleaning residual overburden on the ore body roof.
- Mining.
- Cleaning residual ore on the ore body floor.
- Backfilling with stripped overburden.
- Land rehabilitation.
- Ecological restoration.



Ore Preparation (Screening & Crushing)

- Run of mine ore are screened by grizzly to separate waste rock, size of +300mm.
- The under size of ore are crushed to -50mm and sent to ore bin via belt conveyor. Ore Preparation Capacity is 4400 tons per day of dry ore. Waste Rock produced per day is 312 tons/day.



Ore Transportation

- Type of Conveyor - Tubular Belt
- Horizontal Length - 4986.812m
- Max. Inclined Angle - 19° 41' 24"
- Pipe diameter - Φ 350mm
- Width of Belt - 1300mm
- Speed - 2.0m/sec
- Hauling Capacity - 500t/h



Ore Stock Pile Yard

- Crushed ore sent via Tubular Belt Conveyor piled at Stock Yard and blend to reached average assay of nickel content to round about 2%.
- The composition of the ore to be processed are as follow as:-

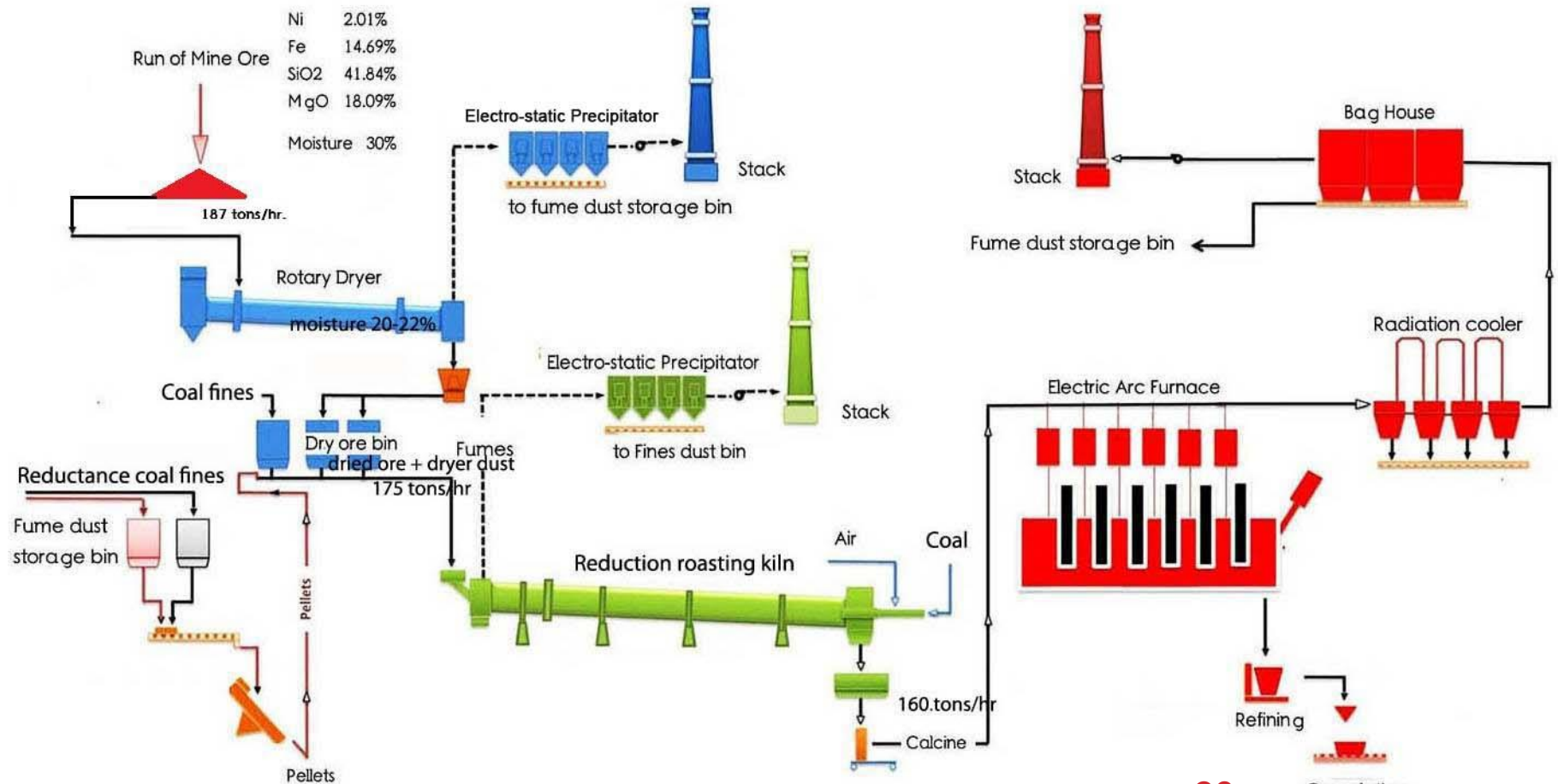
Ni	1.93% to 2.30%
Fe	12.12% to 14.44%
SiO ₂	37.91% to 43.38%
MgO	18.6% to 19.61%



Main Equipment

Sr.	Description	Specification	Unit	Qty.
1.	Dryer	4.5 dia. x 40 m		2
2.	Kiln	6.0 dia. x 135 m		2
3.	Electric Arc Furnace	80 MW		2
4.	LF Furnace	50 tons		1

Flow sheet of Ferronickel Extraction Process





Flue dust prepare for recycling, Pelletizer



Dryer 4.5 m Φ x 40 mL (2 nos.)



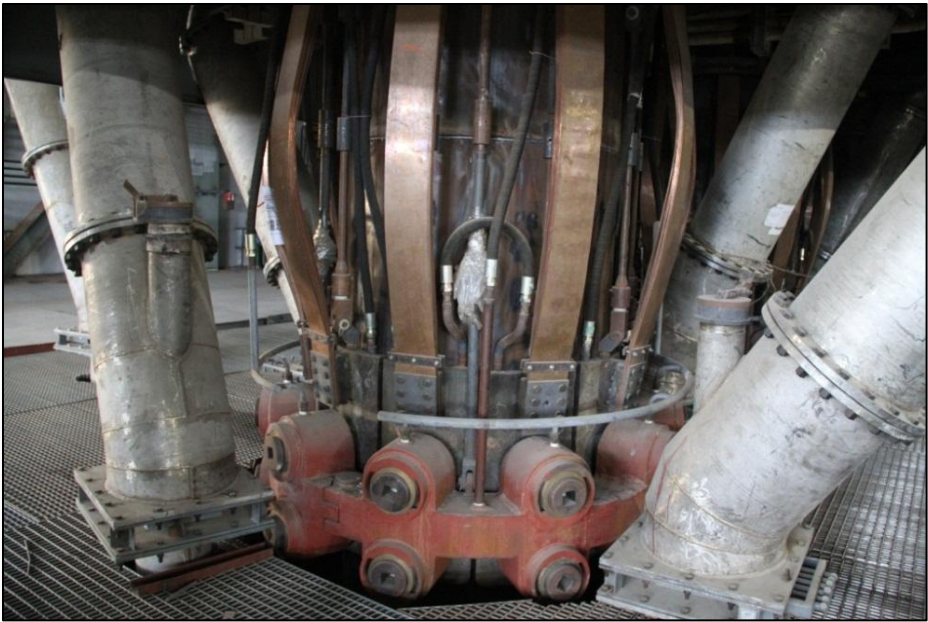
Reduction Kiln 6 m Φ x 135 mL (2 nos.)



Electrostatic precipitator



Electric Arc Furnace (2 nos.)



Furnace electrodes (6 no.s for each furnace)



Tap holes



EAF Furnace



Fe-Ni molten metal tapping



Furnace electrodes (6 no.s for each furnace)



Crude Fe-Ni sent to refining stage



Crude Fe-Ni weighing



Ladle refining of crude Fe-Ni



Granulation



Granulation



Granules weighing and packing unit



Granules (-5mm ~ +2mm)



Ferronickel Granules

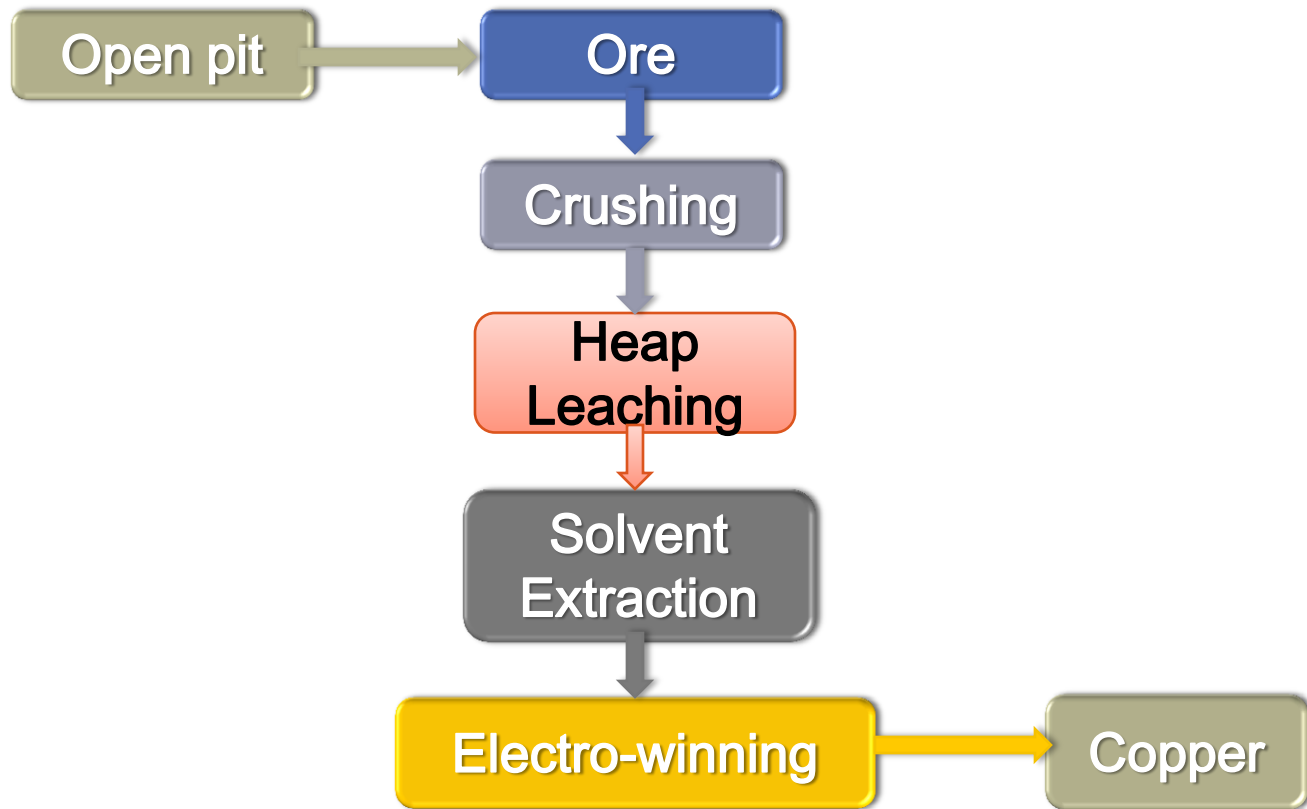
Material Balance

Sr.	Description	Qty.	Nickel		Distribution
		(tons/day)	Ni grade	Ni wt.	(%)
			(%)	(ton)	
	Charge				
1	Laterite ore	4400	2.01	88.44	100
	Products				
1	Ferronickel	289	26	75.17	85
2	Slag			13.27	15

Monywa Copper Project

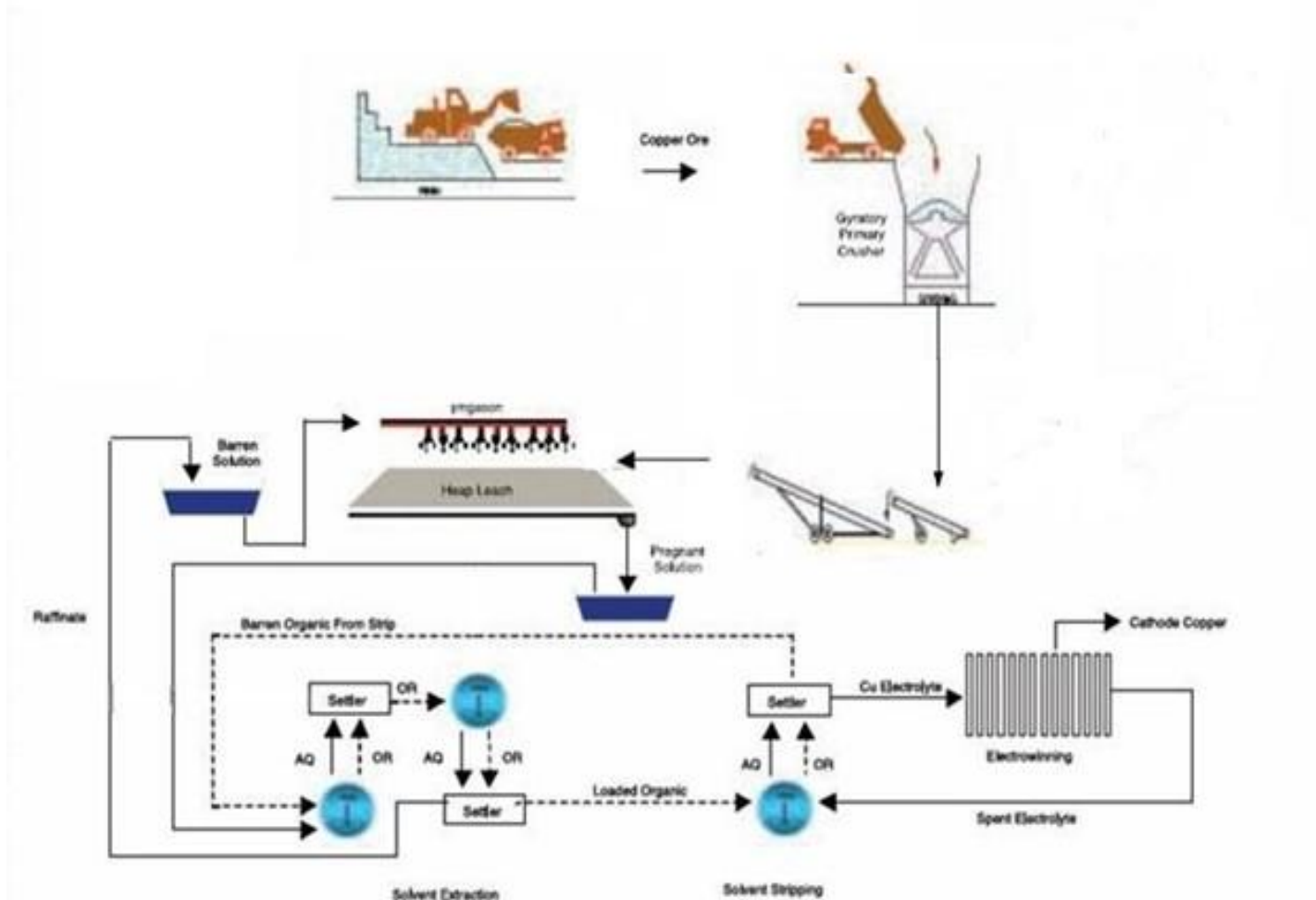


Flow Sheet of Monywa Copper Project



- Produce Grade 'A' London Metal Exchange (LME) Copper, and cathode copper purity is above 99.9935%

Schematic Flow Sheet of Monywa



Open-pit Mining



Heap Leaching



Solvent Extraction



Electro-winning



MINING LAW AND MINING PROJECT

- The amendment of existing *Myanmar Mines Law and Related Regulations*, Myanmar Mines Law was drafted for amending with the advice of experts, publics and technical assistance of AusAIDs, World Bank, the comments from the investors of Myanmar's Mining Industries and experts who have internationally experiences.
- Upcoming Mining Law and Related regulation concern the environmental conservation, socio-economic of the locals and creating the Win-Win situation between the investors and the State. So this new Law set to attract the Foreign Investor which ensure to get more benefits and more reliable to invest in Myanmar's mining sector.
- The draft of the Myanmar Mines Law is accepted by the Union Attorney General Office and ready to submit to the next parliament which will be held on 1st October 2013. Also the Myanmar Mines Rules is drafted and almost finish enacting within the 90 days after the approval for the Myanmar Mines Law from the Parliament. So, The Myanmar Mines Law and Rules are very ready for you soon.

MINING LAW AND MINING PROJECT

- Regarding to the Foreign Investment Law, there is some incentive for Foreign Investors such as 5 years exemption of commercial tax for exported mineral products.
- The Ministry of Mines tries the best with the appropriate policy and set the regulations. From this we expect to promote the utilization of Myanmar valuable mineral resources for the production to refined products through the contribution of foreign investment with advanced technologies.

A large-scale open-pit mine is shown, characterized by its terraced, stepped levels of reddish-brown earth and rock. The mine is situated in a valley, with steep, green hills rising on either side. The sky is overcast with grey clouds, and some mist or low clouds are visible near the mountain peaks. The overall scene depicts a significant industrial operation in a natural, mountainous environment.

**Thank you
for your attention**

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